ADMINISTRATIVE UPGRADES
AT
ADAMS HILL ELEMENTARY SCHOOL
Northside Independent School District
RFCSP NO: 2020-004
March 16, 2020

Project Manual
Volume 1 of 2

Northside Independent School District
Facilities and Operations
5900 Evers Road
San Antonio, Texas 78238
210-397-1200

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NORTHSIDE INDEPENDENT SCHOOL DISTRICT

Dr. Brian T. Woods, Superintendent
5900 Evers Road, San Antonio, Texas 78238

FACILITIES AND OPERATIONS DEPARTMENT
Leroy San Miguel, Assistant Superintendent for Facilities & Operations
James Evans, Director of Facilities Construction
Jacob Villarreal, P.E., Director of Engineering
5900 Evers Road
San Antonio, Texas 78238
Telephone: 397-1200 (Facilities); 397-1240 (Engineering)
Facsimile: 257-1212

PURCHASING DEPARTMENT
George Ayala, Director
607 Richland Hills Dr. #700
San Antonio, TX 78245-2149
Telephone: 397-8712; Facsimile: 706-8834

CONSULTING ARCHITECT/ENGINEER
Garza/Bomberger & Associates
5545 Fredericksburg Road, Ste. 100
San Antonio, Texas 78229

Date: March 16, 2020
RFCSP No. 2020-004

INVITATION TO OFFERORS
(Competitive Sealed Proposals)

1. REQUEST FOR COMPETITIVE SEALED PROPOSALS (RFCSP): The Northside Independent School District (“NISD” or “Owner”) of Bexar County, Texas proposes to construct the Administrative Upgrades at Adams Hill Elementary School (“Project”) and is requesting competitive sealed proposals for the work pursuant to Chapter 2269 of the Government Code. Proposals are to be submitted in accordance with this invitation and the accompanying instructions.

2. DESCRIPTION OF PROJECT: The Project is generally described as follows: Addition and renovation to the administrative area at Adams Hill Elementary School, located at 9627 Adams Hill Drive, San Antonio, Texas 78245. Work includes demolition of existing administrative area, lobby and exterior canopy to accommodate new addition and new canopy system. Work includes demolition, general construction, heating, air conditioning, electrical, plumbing, fire alarm upgrade, and all other work as indicated on the construction documents.

3. TIME OF COMMENCEMENT AND COMPLETION: The Project must be complete and ready for occupancy not later than December 28, 2020, assuming that the successful Offeror is given notice of its top ranking on or before April 30, 2020. Any proposal must provide for final completion by this date. The Notice to Proceed may be issued up to forty-five (45) consecutive calendar days following the Notice of Award. The Contractor shall take this period into account in the preparation of its Proposal. No claim for additional time shall be considered unless this period is exceeded.
Alternately, Offerors are asked to submit the number of calendar days required for completion of the Work, if completion of the Work shall be prior to such date.

4. **ESTIMATED PROJECT BUDGET:** $4,100,000.00, based on the Plans and Specifications dated March 16, 2020, Job No. 19-210 prepared by Garza/Bomberger & Associates (“Architect/Engineer”).

5. **PRE-PROPOSAL CONFERENCE:** A Voluntary Pre-Proposal Conference will be conducted at 2:00 p.m. on March 30, 2020, at the Northside Activity Center, Bldg. A, 7001 Culebra Road, SAT 78238. All persons desiring to submit a proposal are encouraged to attend this conference. A tour of the project site will be conducted immediately following the pre-proposal conference at Adams Hill Elementary School, beginning at 3:15 p.m.

6. **PROPOSAL DOCUMENTS:** “General Contractors may obtain up to two (2) sets of Proposal Documents from the office of the Architect/Engineer upon receipt by Architect/Engineer of a deposit, in the form of cash or a check, payable to Architect/Engineer in the amount of $200.00 for each set which shall be refundable provided the General Contractor submits a valid proposal and also provided that the Contract Documents are returned to the Architect/Engineer in good condition within ten (10) days after the date of receipt of proposals. Subcontractors and suppliers may obtain up to one (1) set of Proposal Documents from the office of the Architect/Engineer upon receipt by Architect/Engineer of a deposit, in the form of cash or a check, payable to Architect/Engineer in the amount of $200.00 for each set which shall be refundable provided the subcontractor or supplier submits a valid proposal and also provided that the Contract Documents are returned to the Architect/Engineer in good condition within ten (10) days after the date of receipt of proposals. Additional sets may be purchased from the Architect/Engineer by General Contractor, subcontractor or supplier at the cost of $200.00 per set. All payments shall be made payable to the order of (Architect/Engineer name). No partial sets of bid documents will be issued, and the Owner and/or Architect/Engineer will have no responsibility for errors or misinterpretations resulting from the use of incomplete sets of documents. If the Proposal Documents are timely returned but in poor condition, a reasonable amount for the cost of reproduction will be deducted from the amount of deposit and the remaining balance will refunded to the General Contractor, subcontractor or supplier. If the Proposal Documents are not timely returned to Architect/Engineer, or if a proposal is not submitted, the deposit will be forfeited.”

In addition to the above, copies of the “Proposal Documents” may be examined during normal business hours at the following locations:

Virtual Builder’s Exchange, LLC
4047 Naco-Perrin
San Antonio, Texas 78217
Telephone: (210) 564-6900

iSqFt plan room
4538 W Commerce Street #307
San Antonio, TX 78237
Phone: 800-364-2059 x 8322
Fax: 866-570-8187

7. **SCHEDULE FOR PROPOSAL RECEIPT AND OPENING OF PROPOSALS:** All proposals must be delivered in person or by United States mail. Proposals received by oral, telephonic, facsimile, telegraph or other electronic means are invalid and will not receive consideration. All documents required to be submitted as set forth in the Instructions to Offerors
shall be enclosed in a sealed, opaque envelope, addressed to the “Board of Trustees for
Northside Independent School District” at the address specified below and identified as a
proposal for the Administrative Upgrades at Adams Hill Elementary School, RFCSP No.
2020-004.
If the proposal is delivered other than by personal delivery, the sealed envelope shall be enclosed
in a separate envelope clearly notated “Sealed Proposal Enclosed” on the face thereof. All
proposals must be delivered to Owner at the following address:

Mr. George Ayala
Northside Independent School District
NISD Purchasing Department
607 Richland Hills Dr. #700
San Antonio, TX 78245-2149

Proposals will be received by the Owner until, 10:30 a.m. on April 7, 2020. At
such time, all proposals timely received shall be publicly opened and the name of the Offeror and
the monetary terms of the proposal read aloud. Each Offeror shall assume full responsibility for
timely delivery of its proposal to the location designated for receipt of proposal. Proposals
received after the date and time for receipt of proposals will not receive consideration and will be
returned unopened.

8. PROPOSAL SECURITY: Each proposal must be accompanied by proposal security in
the amount of five percent (5%) of the total proposal, including all additive alternatives, pledging
that the successful Offeror will, within 30 calendar days after the successful Offeror is notified of
the acceptance of its proposal, enter into a written contract with the Owner on the terms stated in
the “Proposal Documents”, as evidenced by the unconditional execution and delivery of such
contract, and furnish payment and performance bonds, evidence of insurance and other
submittals as required by the “Proposal Documents”. Should the successful Offeror fail or refuse
to enter into such contract or furnish such bonds or evidence of insurance within the time above-
stated, such proposal security shall be forfeited to the Owner as damages, not as a penalty. Such
proposal security shall be in the form of cash, certified funds payable to the order of the Owner,
or a bond in favor of the Owner. The bond shall be on AIA Document A310 “1970 Edition,” and
shall be issued by a corporate surety duly authorized and admitted to do business in the State of
Texas, and licensed by the State of Texas to issue surety bonds and to be an executed original.
If the amount of the bond exceeds the legal underwriting limitation of the surety, the Offeror and
the surety shall provide the Owner with evidence that the excess is reinsured with one or more
reinsurers who are duly authorized, accredited, and licensed to do business in the State of Texas.
Any proposal which is not accompanied with proposal security in the form and amount required
herein shall be rejected as nonconforming. The Owner shall have the right to retain the security
of all Offerors to whom an award is being considered until either (i) the Contract has been
unconditionally executed and delivered by the parties and any required payment and performance
bonds, evidence of insurance and other submittals have been furnished, or (ii) all proposals have
been rejected by the Owner without the acceptance of any proposal.
INSTRUCTIONS TO OFFERORS
(Competitive Sealed Proposals)

PROPOSAL DOCUMENTS: The “Proposal Documents” shall include the Invitation to Offerors, these Instructions to Offerors, the Contract Documents (as defined below), the Proposal Form, and any other sample proposal and contract forms. The Contract Documents shall consist of the Agreement between Owner and Contractor (the “Contract”), the General Conditions to the Contract (AIA Form A201, 2007 Edition), the Supplementary and Other Conditions included with the “Proposal Documents”, and the Drawings, and all Addenda issued prior to execution of the Contract. Each Offeror shall carefully study and compare the Contract Documents with one another and with any existing work or work under construction, shall examine the site and local conditions, and shall at once report to the Architect/Engineer any errors, inconsistencies or ambiguities discovered. By submitting a proposal, the Offeror represents that the Offeror has prior experience on construction projects of the same or similar type, nature and class as the Work; that the Offeror has read and understands the “Proposal Documents”, including the Contract Documents; that the proposal is made in accordance with the “Proposal Documents”; and that the Offeror has visited the site, become familiar with the local conditions under which the Work is to be performed, and has correlated the Offeror’s site observations with the requirements of the Contract Documents.

Offerors may request clarification or interpretation of “Proposal Documents”. Any such request must be in writing and must be received by the Architect/Engineer at least FIVE (5) days prior to the last date for receipt of proposals. Interpretations, corrections and/or changes of or to the “Proposal Documents” will be made by written Addendum. Any interpretations, corrections or changes of or to the “Proposal documents”, made in any other manner will not be binding upon the Owner, and Offerors may not rely thereon.

Any discrepancy or conflict with the Drawings shall be brought to the attention of Architect/Engineer and the Owner. Discrepancies or conflicts not brought to Architect/Engineer’s and Owner’s attention and clarified during the proposal process for the Project will be deemed to have been priced in the more costly manner or difficult manner, and the better quality or greater quantity of the Work shall be provided by the Contractor in accordance with Architect/Engineer’s interpretation.

ADDENDA: Addenda will be mailed and/or faxed to all who are known by the Architect/Engineer to have received a complete set of “Proposal Documents”, and will be sent to the address of each Offeror furnished by such Offeror for such purposes. In addition, copies of Addenda will be made available for inspection wherever “Proposal Documents” are on file for that purpose. Each Offeror shall acknowledge in its proposal its receipt of all Addenda issued. Failure of an Offeror to receive any such Addenda shall not relieve the Offeror from any obligation under its proposal as submitted. All Addenda so issued shall become a part of the Contract Documents.

ALTERNATES: Alternate bids are sums added or deducted from the Base Bid Proposal(s) for certain work defined in the Contract Documents. The Offeror shall clearly distinguish on the Proposal Form whether the proposed Alternate(s) is additive or deductive. If there is not effective cost change the Offeror shall insert the term “No Cost” meaning that the Alternate may be awarded, but there will be no cost impact to the work if accepted by the Owner. The Owner shall reserve the right to award Alternates in any
order without regard to the listing on the Proposal Form. Alternates shall include all labor, material, equipment, overhead and profit. A Proposal may be deemed, at the sole discretion of the Owner, to be non-responsive and receive no further consideration if Alternate bid items are not bid.

**FORM OF PROPOSAL**: Proposals shall be submitted on the prescribed form, and all blanks on the proposal form shall be completed, in ink or type-written, with sums expressed in both words and figures (in case of discrepancy between the two, the amount written in words shall govern). All requested alternates shall be priced, and if no change in the base price is required, the phrase “No Change” shall be inserted into the appropriate location. Each copy of the proposal shall include the legal name of the Offeror and shall indicate whether the Offeror is a sole proprietor, partnership, corporation, limited liability company, or other legal entity. Each copy of the proposal shall be signed by the person or persons legally authorized to bind the Offeror. A proposal by a corporation or limited liability company shall name the state of incorporation or organization of the Offeror, and shall include reasonable evidence of the authority of the person signing the proposal to bind the corporation or limited liability Company.

Offeror shall execute and deliver to Owner with its Proposal, each of the following:

a. **Contractor’s Qualification Statement (AIA Form A305)**: Executed counterpart of the Contractor’s Qualification Statement, a copy of which is attached to the Proposal Form as **Schedule 1**.

b. **Subcontractors and Suppliers**: A list of the subcontractors and material suppliers which the Offeror proposes to use for the Work, in the form attached to the Proposal Form as **Schedule 2**. All spaces on the attached Schedule shall be completed, and should any particular item or trade not apply, the Offeror shall mark “not applicable” in the appropriate space. Each Offeror is advised that all persons, firm, corporations or other parties to whom the Offeror proposes to award a subcontract hereunder must be acceptable to the Owner. The Schedule described herein is in addition to, and not in limitation of, the requirements for submission and approval of subcontractors and suppliers contained in Article 5 of the General Conditions. The Owner may require evidence of a subcontractor’s bondability if the subcontractor’s contract exceeds $100,000.00 in the aggregate.

c. **Felony Conviction Notification**: Executed counterpart of the Felony Conviction Notification, in the form attached to the Proposal Form as **Schedule 4**.

d. **Hold Harmless Agreement**: Executed counterpart of the Hold Harmless Agreement, in the form attached to the Proposal Form as **Schedule 5**.

e. **Financial Statements**: Current financial statements of the Offeror, as of the most recent calendar (or fiscal) year ended and current monthly income and expense statements for the fiscal year to date, certified by the
Offeror to be true and correct, to be attached to the Proposal Form as Schedule 6.

f. **Insurance and Bonding Certification:** A certification by the President or a Vice President of the Offeror, representing to Owner that the Offeror has the capability to satisfy the insurance and bonding requirements set out in the “Proposal Documents”, in the form attached to the Proposal Form as Schedule 7.

g. **Proposal Security:** A certified check or proposal bond issued by surety authorized to issue surety bonds in the State of Texas in the amount equal to five percent (5%) of the Base Proposal, plus all additive alternatives, if applicable, to be attached to the Proposal Form.

Items (a) – (g) above, as well as the information described below to be included as Exhibits A, B, and C, are required by the Owner to adequately evaluate the Offeror’s qualifications. Failure of the Offeror to deliver any such items with its proposal shall constitute a basis for rejection of the proposal by the Owner.

Only one executed original and two copies of executed original of the Proposal Form, Schedule 2, and the Proposal Security need be submitted to Owner. All other Schedules (1, 4, 5, 6 and 7) and Exhibits A, B, and C, shall be submitted in triplicate.

**PROPOSAL SELECTION CRITERIA:** Award of the Contract resulting from this solicitation shall be under the selection process described herein. A committee appointed by Owner will evaluate Proposals submitted in response to this solicitation. The five (5) divisions of selection criteria (“Divisions”) are as follows:

(A) Relevant Experience  
(B) Project Management Ability  
(C) Past Performance  
(D) Subcontractor and Supplier Support Capability  
(E) Price Proposal

Each of the Divisions has been assigned an appropriate weight by the Owner, as set forth below. Following an analysis and evaluation of the proposals, ranking of the Offerors will be made based upon the selection criteria. In the event of a tie in the rankings, Owner shall break the tie based upon Owner’s determination of which proposal will provide the best value to Owner. Subjective judgment on the part of the Owner is implicit in the criteria selection process. The selection process permits placing technical considerations above total price. Therefore, the Owner reserves the right to award to other than the lowest proposed price. Once the Offerors have been ranked, the Owner will begin contract negotiations with the first ranked Offeror. If the Owner is unable to come to terms with the first ranked Offeror, discussions will be terminated and the Owner will proceed to the next ranked Offeror and repeat the process until a contract agreement is reached or all proposals are rejected.

Any Proposal may be considered unacceptable if the committee determines it fails to provide adequate information in technical and price proposals as specified in this Instruction to Offerors.
Within 45 days after the opening of the proposals, the Owner shall evaluate and rank sequentially each proposal submitted in relation to the selection criteria. In accordance with relevant statutory provisions, Owner reserves the right not to make the evaluations or rankings public until seven days after the Contract has been fully executed by the Owner and the selected contractor. There shall be no right to protest or appeal the rankings prior to the time that the Contract is executed; however, after the rankings are made public, the Owner shall receive any comments, in writing, from any Offeror not selected.

**SELECTION CRITERIA:** The Owner will evaluate the proposals submitted based upon the selection criteria more fully described below:

**(A) RELEVANT EXPERIENCE – (11 Points) - Attach to the Proposal Form as Exhibit A**

1. Experience as a general contractor with specific experience in facilities construction projects of the same or similar type, size, nature and class as the Project being proposed, including work performed in connection with a facility which is occupied and in use during construction, if applicable. Consideration will be given to the number of years of experience, which an Offeror has.

2. Representative projects (dollar value and/or scope/size) must be submitted as references to include the project name, Architect/Engineer or engineer, cost of the project and the contact person to include phone number. Consideration will only be given to projects which are occupied or substantially complete. Educational Facilities Projects may receive greater consideration.

**(B) PROJECT MANAGEMENT ABILITY – (11 Points) - Attach to the Proposal Form as Exhibit B.**

1. The Offeror shall provide evidence of sufficient resources necessary to manage, staff, and successfully perform the work contemplated under this proposal. Provide a brief profile of the Offeror, including its principal line of business, the year founded, number and location of offices, and the number of employees. Identify any condition (bankruptcy, pending merger, pending litigation, planned office closures or others) that may enhance or impede the Offeror’s ability to perform the services.

   
   
   (a) The Offeror shall include a discussion of its organizational structure and indicate the number and qualifications of key personnel, including the designation of a project manager and project superintendent. Resumes of the project manager and project superintendent (including a description of relevant experience) shall be included by the Offeror.

   (b) The Offeror shall include a discussion of the methods, tools, or procedures used to schedule the work contemplated under this proposal and shall include the total number of calendar days that are required to complete the scope of the work. Time of completion of the contract is important to the Owner and will be a factor in the consideration of the award of the contract.
(c) The Offeror shall include evidence of its ability to obtain the required bonds and insurance, and the ability to cover operating expenses. Such evidence includes pertinent bank, bonding company, and creditor references, with account numbers, points of contact, and telephone numbers.

(d) Each Offeror shall be capable of furnishing payment and performance bonds, each in the amount of 100% of the contract sum. The Surety Company providing the bonds must be approved for the amount of the bonds by applicable laws of the State of Texas and by Owner and licensed to do business in the State of Texas.

(e) The Offeror shall be otherwise qualified and eligible to receive an award and perform the contractor’s obligations in connection with the Project, under applicable laws and regulations.

(f) The Offeror shall list additional project support available which would be utilized on this project to insure timely and quality completion.

(C) PAST PERFORMANCE – (8 Points) - Attach to the Proposal Form as Exhibit C.

The contractor shall provide evidence in the form of a narrative description, reference letters, bar charts and any other form of additional information that attests to their past performance and addresses at a minimum items (I) through (vii) listed below. Contractors currently providing construction services to the Northside Independent School District should provide information from other school districts or clients. Past performance will be considered in the evaluation process, including but not limited to, the following:

(i) Ability of contractor to remain on schedule.
(ii) Cooperation with owner of project and staff.
(iii) Proper and timely coordination of all trades and support personnel in completing the project.
(iv) Minimum number of major deficiencies on the substantial completion punch list.
(v) Minimum number of warranty item call backs during the warranty phase, and warranty responsiveness.
(vi) Consistent demonstration of commitment to excellence in workmanship.
(vii) Safety record.

If Offeror does not have previous construction experience with the Northside Independent School District, consideration will be given to references from other representative projects.

(D) SUBCONTRACTOR AND SUPPLIER SUPPORT CAPABILITY – (25 Points)

1. The Offeror shall submit a schedule of proposed subcontractors for this Project. [See Schedule 2.] The Offeror should be capable of submitting
resumes and references for each subcontractor listed, if requested by Owner.

**E) PRICE PROPOSALS – (45 Points)**

1. The Owner will consider the total contract cost as part of its evaluation. The Owner shall have the right to accept alternates in any order or combination unless otherwise specifically provided in the Proposal Documents.

2. The Offeror submitting the lowest proposed amount shall receive the highest number of points in this category, and the Offeror submitting the highest proposed amount shall receive the lowest number of points awarded in this category.

**F) PROPOSAL REVIEW COMMITTEE**

1. The proposal review committee will include, but not be limited to, the Assistant Superintendent for Facilities and Operations, the Executive Director of Construction & Engineering, the Director of Facilities Construction or the Director of Engineering, the Director of Purchasing, the Architect/Engineer, and any applicable Architect/Engineer’s consultants.

**MODIFICATIONS AND PROPOSAL WITHDRAWAL:** A proposal may not be modified, withdrawn or canceled by an Offeror for a period of forty Five (45) days after the last date specified for receipt of proposals. Prior to the last date specified for receipt of proposals, a proposal may be modified or withdrawn by notice to the Owner’s Director of Purchasing at the place designated for receipt of proposals. Such notice shall be in writing and executed by the Offeror. If by telegram, written confirmation executed by the Offeror shall be mailed and postmarked on or before the stated time set for receipt of proposals. Any modification shall be worded so as not to reveal the amount of the original proposal. Any proposal withdrawn may be resubmitted within the time designated for the receipt of proposals.

**ACCEPTANCE AND/OR REJECTION OF PROPOSALS:** The Owner may request from Offeror a written interpretation of any term or statement in the proposal that is or appears unclear or subject to more than one interpretation, and may act upon such written interpretation. Conditional proposals will not be accepted. The Owner shall have the right to reject all proposals, to reject a proposal not accompanied by the required security, to reject a proposal which is in any way incomplete, irregular or nonconforming, or to reject a proposal which may otherwise be legally rejected for any reason. To the extent allowed by law, the Owner may waive any formality in any proposal.

Unless the Owner rejects all proposals, the Owner intends to award the Contract to the Offeror that offers the best value to the Owner based on the listed selection criteria. If the Owner is unable to reach a contract agreement with the selected Offeror, the Owner shall terminate further discussions and proceed to the next Offeror in the order of the selection ranking until a contract agreement is reached or all proposals are rejected. Time is of the essence, and the award of the contract to the successful Offeror is expressly conditioned upon (i) the Offeror’s execution and delivery of the Contract,
and delivery of all required payment and performance bonds and evidence of insurance, within ten (10) calendar days after the successful Offeror is notified of the acceptance of its proposal, (ii) submission of notarized and completed House Bill Form 1295 in an original form and a copy and (iii) the Offeror’s timely fulfillment of any and all other preconditions expressly set forth in the Contract Documents. Should the Offeror fail to timely execute and deliver the Contract, required bonds, evidence of insurance, or fail to timely fulfill any other such preconditions, the Owner may, at its option and discretion, without releasing, impairing or affecting its right to receive the security as damages for such failure, rescind the proposed award and thereafter negotiate with and award the Contract to the next ranked Offeror, or may reject all proposals. There will be no contractual obligation on the part of the Owner to any Offeror, nor will any Offeror have any property interest or other right in the Contract or Work being proposed, nor may the Offeror have any reasonable expectation of being awarded the Contract, unless and until the Contract is unconditionally executed and delivered by all parties, and all conditions to be fulfilled by the Offeror have either been so fulfilled by the Offeror or waived in writing by the Owner.

Each Offeror by submission of a proposal waives any claims it has or may have against the Owner, the Architect/Engineer, its consulting engineers and their employees, and any other consultants, officers, and employees of Owner, connected with or arising out of the proposal administration, proposal evaluation, proposal ranking, proposal recommendation, the award of the Contract, and the rejection of any proposals.

**INSURANCE & PAYMENT & PERFORMANCE BONDS:** The successful Offeror shall deliver to the Owner, within the time specified in the Proposal Documents, evidence of insurance and original payment and performance bonds, all in accordance with the requirements set forth in the “Proposal Documents”.

**TRENCH EXCAVATION PROTECTION:** Specific reference is hereby made to those certain sections, divisions, and parts of the Specifications which contain requirements for trench excavation protection with respect to the Work. Each Offeror should specifically note the fact that certain requirements with respect to such trench excavation protection must be satisfied prior to award of the Contract.

**PREVAILING WAGE RATES:** As set forth in the Contract Documents, each Offeror is advised that, if awarded the Contract, the Offeror must comply with the requirements of V.T.C.A, Government Code §2258.001 et seq., with respect to the Work, and in this regard shall pay to and cause all of its subcontractors to pay not less than the general prevailing rate of per diem wages and the prevailing rate for legal holidays and overtime work, as ascertained by the Owner.
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A. Relevant Experience (11 Pts.)

1. Experience
   a. Less than 5 years 1
   b. >5 to 8 years 2
   c. >9 or more years 4

2. Representative Projects (Substantially Complete)
   a. 0 0
   b. 1 to 3 2
   c. 4 to 6 4
   d. 7+ 7

TOTAL 0 0 0 0 0 0 0 0 0

B. Project Management Ability (11 Pts.)

1. Organizational Structure
   a. Project Super's Experience 5
   b. Project Manager's Experience 5

2. Project Support 1

TOTAL 0 0 0 0 0 0 0 0 0

C. Past Performance (8 Pts.)

1. Timely Completion 2

2. Coordination of Trades 1

3. Quality of Workmanship 1

4. Warranty Responsiveness 2

5. Punch List Length & Completion 1

TOTAL 0 0 0 0 0 0 0 0 0

D. Subcontractors & Suppliers (25 Pts.)

1. List of Subs & Suppliers
   a. Site Work 3
   b. Structural 3
   c. Architectural 3
   d. Mechanical 3
   e. Electrical 3
   f. Plumbing 1

TOTAL 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

E. Price Proposal-Based on Total Bid (45 Pts.)

1. Lowest Proposal 45

2. >10% above low bid 42 to 44

3. >5 to 10% above low bid 39 to 41

4. >10% above low bid 36 to 38

5. >15 to 20% above low bid 30 to 35

6. Each added 5% above 5 points 0 to 25

TOTAL 0 0 0 0 0 0 0 0 0

SUBTOTAL (A,B,D & E) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

(WITHOUT C. Past Performance)

GRAND TOTAL 0 0 0 0 0 0 0 0 0
PROPOSAL FORM
(Competitive Sealed Proposal)

PROPOSAL OF:

(Name of Offeror)

TO:  Director of Purchasing

FOR:  ADMINISTRATIVE UPGRADES AT ADAMS HILL ELEMENTARY SCHOOL

PROPOSAL # __________

Attention Owner:

The Offeror named herein (hereinafter called “Offeror”), in compliance with the Invitation to Offerors and Instructions to Offerors for the (“Project”) for the Northside Independent School District, San Antonio, Texas (“Owner”), having inspected the Project site and carefully examined the Project Drawings, Specifications, Addenda Nos. ____________, and all other Contract Documents (as such term is defined in the Instructions to Offerors), hereby offers to enter into a contract to furnish all labor, materials, tools, equipment, transportation, machinery, supplies, insurance, permits, (per owners special conditions chapter 3, section 3.2) taxes and services necessary to complete the Work in accordance with the Contract Documents, within the time set forth herein, and at the prices stated herein. The Offeror fully understands the intent and purpose of the Contract Documents and the conditions of offer as set forth herein and in the Invitation to Offerors and the Instructions to Offerors. The Offeror hereby covenants and agrees that claims for additional compensation or extensions of time because of Offerors failure to familiarize itself with the Contract Documents or any condition at the Project site, which might affect the Work, will not be allowed.

1. **Base Proposal**: The Offeror agrees to execute all of the Work described in the Drawings, Specifications and other Contract Documents, including allowances, for the sum of ____________ and ___/100 DOLLARS ($__________). In case of a difference between written words and numbers in this Proposal Form, the amount stated in written words shall govern. This sum includes a contingency and other allowances totaling $125,000.00. In case of a difference between written words and numbers in this Proposal Form, the amount stated in written words shall govern.

2. **Additive Alternate No. 1**: Modify fire alarm system to include voice annunciation for alarm notification. Add the sum of ____________ and ___/100 DOLLARS ($__________) to the Base Proposal.

3. **Unit Prices**: The Offeror agrees that the Base Proposal may be adjusted by the amounts indicated below for each unit price:

N/A
4. **Time for Completion**: If awarded the Contract, the Offeror agrees to commence the Work within 10 days after notice of award is given by the Owner, and assuming such notice is given on or before ________________, to achieve Substantial Completion of the Work on or before ________________.

5. **Completion Date Alternate**: In the event the Offeror elects to provide a completion date / contract time earlier than the Base Proposal requirement, the Completion Date Alternate below should be completed in full. If no alternate date is provided by the Offeror, the Completion Date Alternate may be left blank. The Owner reserves the right to accept or reject any alternate in the order of the Owner's own choosing.

The Offeror agrees to achieve Substantial Completion of the work on or before ________________, . (_______) consecutive calendar days to Substantially Complete the work from a notice of award given no later than ________________.

6. **Proposal Security**: Proposal security in the form of a certified check or proposal bond in the amount of five percent (5%) of the Base Proposal, plus all additive alternates, if applicable, is attached hereto, as a guaranty that the Offeror will unconditionally execute a satisfactory contract and furnish the payment and performance bonds, insurance and satisfy all other requirements for execution and delivery of the Contract Documents and commencement of the Work. NOTE: Please see the following link for information on Owner's Proposal Security Requirements: http://www.nisd.net/sites/default/files/pdf/business/purchasing/bonds.pdf

7. **Contractor's Personnel**: The Offeror agrees to employ the following individuals for the entire duration of the Work at the positions indicated, and agrees not to remove them from the Work nor replace them with others except as otherwise allowed in the Contract Documents or approved in writing by Owner:

   Project Manager: ________________________________

   Project Superintendent: ____________________________

   Project Support: ________________________________

8. **Representations**: By execution and submission of this Proposal, the Offeror hereby covenants, represents and warrants to Owner as follows:

   (a) The Offeror has prior experience on construction projects of the same or similar type, nature and class as the Work for the Project.

   (b) The Offeror has read and understands the “Proposal Documents”, including the Contract Documents, and this Proposal is made in accordance with the “Proposal Documents”.

   (c) The Offeror has carefully inspected the Project site, and that from the Offerors own investigation, the Offeror has satisfied itself as to the nature and location of the Work and the character, quality, quantities, materials and difficulties to be encountered; the kind and extent of equipment and other facilities needed for the performance of the Work; the general and local conditions and other items which may in any way affect the Work or its performance; and the Offeror has correlated the Offerors site observations with the requirements of the Contract Documents. The Offeror understands and accepts the difficulties and costs associated with the Work and the Project site and the potential delays, disruptions in work and costs associated therewith and has included such considerations in its construction schedule and the Proposal amount.
(d) To the fullest extent permitted by applicable law, the Offeror hereby waives any and all claims it has or may hereafter have against the Owner, the Architect/Engineer, and their respective trustees, officers, shareholders, directors, partners, agents, contractors, consultants and employees arising out of or in connection with, or related to (i) the administration, evaluation, ranking, or recommendation of any proposals; (ii) any requirements under the “Proposal Documents” or the Contract Documents; (iii) acceptance or rejection of any proposals; and (iv) the award of the Contract. The Offeror knows and understands that the Offeror, by this waiver, is relinquishing current and future rights, benefits and advantages, and the Offeror hereby does so voluntarily and intentionally.

9. Attached Schedules and Selection Criteria Exhibits: The following Schedules and Exhibits are attached to this Proposal Form, and by this reference are expressly incorporated herein:

- Schedule 1 - Contractor’s Qualification Statement (AIA Form A305)
- Schedule 2 - Proposed Subcontractors and Suppliers
- Schedule 3 - Asbestos Exhibits (close out submission)
- Schedule 4 - Felony Conviction Notification
- Schedule 5 - Hold Harmless Agreement
- Schedule 6 - Financial Statements
- Schedule 7 - Insurance and Bonding Certification
- Schedule 8 – Conflict of Interest Questionnaire
- Exhibit A - Relevant Experience
- Exhibit B - Project Management Ability
- Exhibit C - Past Performance

OFFEROR

____________________________________

By: __________________________________

(Signature with Blue Ink required: Original Proposal Form required for consideration. Copies will not be accepted.)

Name:___________________________________

Title:____________________________________
SCHEDULE 1

CONTRACTOR’S QUALIFICATION STATEMENT (AIA FORM A305)
## Contractor’s Qualification Statement

1986 EDITION

This form is approved and recommended by The American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by the AIA or AGC.

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

| SUBMITTED TO: |  |
| SUBMITTED BY: |  |
| ADDRESS: |  |
| NAME: |  |
| ADDRESS: |  |
| PRINCIPAL OFFICE: |  |

**NAME OF PROJECT (if applicable):**

**TYPE OF WORK (file separate form for each Classification of Work):**

- [ ] General Construction
- [ ] Plumbing
- [ ] Other (please specify)
- [ ] HVAC
- [ ] Electrical
- [ ] Corporation
- [ ] Partnership
- [ ] Individual
- [ ] Joint Venture
- [ ] Other

---

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Proposed Subcontractors: Subject to approval by the Owner and Architect, the Bidder agrees to employ the following named Subcontractors for the following trades (insert only one name for each item of work, or if the item of work is not to be subcontracted, the Bidder shall insert the Bidder’s own name; insertion of more than one name will result in a deduction of points during the evaluation and ranking process):

<table>
<thead>
<tr>
<th>ITEM OF WORK</th>
<th>PROPOSED SUBCONTRACTOR</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Work</td>
<td></td>
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<tr>
<td>Site Utilities</td>
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<tr>
<td>Landscaping</td>
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<td>Irrigation</td>
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<td>Structural &amp; Miscellaneous</td>
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<td></td>
</tr>
<tr>
<td>Steel Fabrication</td>
<td></td>
<td></td>
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<tr>
<td>Structural &amp; Miscellaneous</td>
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<tr>
<td>Steel Erection</td>
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<td>Demolition</td>
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<tr>
<td>Insulation Building</td>
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<td>Metal Roofing</td>
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<tr>
<td>Modified Bit Roofing</td>
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<tr>
<td>Steel Doors &amp; Frames (Supplier)</td>
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<tr>
<td>Dampproofing &amp; Waterproofing</td>
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<tr>
<td>Wood Doors (Supplier)</td>
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## SCHEDULE 2
### PROPOSED SUBCONTRACTORS AND SUPPLIERS

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<tr>
<td>Ballistic Storefront</td>
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<tr>
<td>Finish Hardware</td>
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<tr>
<td>Glass &amp; Glazing</td>
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<td>Gypsum Drywall</td>
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<tr>
<td>Acoustical Ceilings</td>
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</tr>
<tr>
<td>Resilient Flooring</td>
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<td>PA System</td>
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<tr>
<td>Technology</td>
<td></td>
</tr>
<tr>
<td>Plumbing</td>
<td></td>
</tr>
</tbody>
</table>
NORTHSIDE INDEPENDENT SCHOOL DISTRICT

GENERAL CONTRACTOR NON-ASBESTOS MATERIALS CERTIFICATION

This will certify that no asbestos containing materials were used in the construction of this project.

NAME OF PROJECT: ___________________________________________

GENERAL CONTRACTOR: _________________________________________

CERTIFIED BY: ________________________________________________

TITLE: _________________________________________________________

DATE: _________________________________________________________
ASBESTOS NOTIFICATION FOR SHORT TERM WORKERS

In accordance with Federal Regulation 40 CFR 763.84(d), short term workers are hereby notified that they may come in contact with asbestos containing building materials while on NISD property. Floor plans identifying known asbestos containing materials, if applicable, will be distributed prior to the beginning of any work.

Contractors will be required to sign a statement certifying that this notification has been provided by NISD.

SHORT TERM WORKER/CONTRACTOR ASBESTOS NOTIFICATION

_________________________________, as a Contractor for Northside Independent School District has been given notice that asbestos-containing materials may be encountered during construction/renovation at _______________________________.

(NAME OF CONTRACTOR)

(NAME OF PROJECT)

If applicable, I have received a copy of existing floor plans showing areas known to contain asbestos containing materials. This notification is given in accordance with Federal Regulation 40 CFR 763.84(d).

RECEIVED BY: ________________________________________________

TITLE: ________________________________________________________

DATE: __________________________
SCHEDULE 4
FELONY CONVICTION NOTIFICATION

State of Texas Legislative Education Code, Section 44.034, Notification of Criminal History, subsection (a) states: “A person or business entity that enters into a contract with a school district must give advance notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.” Subsection (b) states: “A school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract.”

THIS NOTICE IS NOT REQUIRED OF A PUBLICLY-HELD CORPORATION

SUSPENSION OR DEBARMENT CERTIFICATE

Non-Federal entities are prohibited from contracting with or making sub awards under covered transactions to parties that are suspended or debarred or whose principals are suspended or debarred. Covered transactions include procurement for goods or services equal to or in excess of $100,000.00 Contractors receiving individual awards for $100,000.00 or more and all subrecipients must certify that the organization and its principals are not suspended or debarred.

By submitting this offer and signing this certificate, this bidder:

• Certifies that the owner/operator has not been convicted of a felony, except as indicated on a separate attachment to this offer, in accordance with Sec. 44.034, Texas Education Code; and

• Certifies that no suspension or disbarment is in place, which would preclude receiving a federally funded contract.

VENDOR’S NAME:______________________________________________________________

VENDOR’S ADDRESS & TELEPHONE:____________________________________________

AUTHORIZED COMPANY OFFICIALS NAME:_____________________________________
(Printed)

SIGNATURE OF COMPANY OFFICIAL:__________________________________________

DATE:_______________________________________________________________________
SCHEDULE 5
HOLD HARMLESS AGREEMENT

The Contractor shall defend, indemnify, and hold harmless, Northside Independent School District and all of its trustees, officers, agents, and employees from and against all suits, actions, or claims of any character brought for or on account of any injuries or damages (including death) received or sustained by any person or property on account of, arising out of, or in connection with, any negligent act or omission of Contractor or any agent, employee, subcontractor or supplier of Contractor in the execution or performance of the Contract for the Administrative Upgrades at Adams Hill Elementary School (“Project”) designated as Project No. 2020-004, except to the extent caused by the negligence of Northside Independent School District.

The Contractor shall also defend, indemnify and hold harmless, Northside Independent school District and all of its trustees, officers, agents and employees, from and against claims by any subcontractor, supplier, laborer, materialman or mechanic for payment for work or materials provided on behalf of the Contractor in the performance of the Contract and all such claimants shall look solely to Contractor and not Northside Independent School District for satisfaction of such claims.

This Hold Harmless Agreement shall be binding upon the undersigned, and its successors, legal representatives, heirs and assigns.

DATED this _____ day of __________________________, 20____.

CONTRACTOR:
__________________________________________
By: ________________________________________
Name:_______________________________
Title:________________________________

By: _________________________________
Name:_______________________________
Title:_______________________________

STATE OF TEXAS §
COUNTY OF BEXAR §

This instrument was acknowledged before me on the _____ day of ______________, 20____, by __________________________, __________________________ of ____________________________, a Texas ________________, on behalf of said ________________.

_________________________________________
Notary Public, State of Texas
SCHEDULE 6

FINANCIAL STATEMENT

S6-1
SCHEDULE 7

INSURANCE AND BONDING CERTIFICATION

The undersigned, being the President or a Vice President of the Offeror, hereby certifies that the Offeror shall be able to procure and provide to Owner, within the time specified in the Proposal Documents, evidence of insurance and original payment and performance bonds, all in accordance with the requirements set forth in the Proposal Documents.

The undersigned shall reimburse Owner for all damages, costs, and expenses (including reasonable attorneys' fees) which are incurred by Owner and which are related in any way to the falsity of any part of the certification set out herein.

Dated and Effective the _____ day of ______________, 20______.

_______________________________
Signature

_______________________________
Printed Name

_______________________________
Position (President or Vice President)

STATE OF TEXAS §
COUNTY OF BEXAR §

This instrument was acknowledged before me on the ___ day of ____________, 20____, by _________________________________.

_______________________________
Notary Public State of Texas

My Commission Expires: ____________

S7-1
On May 23, 2005, the Texas Senate passed House Bill No. 914, adding Chapter 176 to the Local Government Code, and imposing new disclosure and reporting obligations on vendors and potential vendors to local government entities beginning on January 1, 2006. This includes School District.

Failure to abide by these new statutory requirements can result in possible criminal penalties.

Northside Independent School District is requiring you to complete the attached CONFLICT OF INTEREST QUESTIONNAIRE (FORM CIQ) prepared by the Texas Ethics Commission, at the direction of the legislature and strongly recommends you become familiar with House Bill 914.

Northside Independent School District will not provide any further interpretation or information regarding these new requirements.

Please complete the attached CONFLICT OF INTEREST QUESTIONNAIRE and return it to:

Northside Independent School District
Mr. George M. Ayala
Director of Purchasing
607 Richland Hills Drive #700
San Antonio, Texas 78245
CONFLICT OF INTEREST QUESTIONNAIRE
For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session. This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

Name of person who has a business relationship with local governmental entity.

☐ Check this box if you are filing an update to a previously filed questionnaire.

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

Name of local government officer with whom filer has employment or business relationship.

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

Signature of person doing business with the governmental entity

Date

Adopted 06/29/2007
COMPETITIVE SEALED PROPOSALS
PROPOSAL CHECKLIST

Name of Offeror/Contractor: ________________________________
Project Name: ________________________________
NISD Bid No. __________
Date: _____________

PROPOSAL SUBMISSION DOCUMENTS
Quantity Required – 1 ORIGINAL AND 2 COPIES

☐ Proposal Form
☐ Bid Security – Bid Bond
☐ Schedule 2 – Proposed Subcontractor and Suppliers

SCHEDULES
Quantity Required – 3 COPIES unless otherwise noted

☐ Schedule 1 - Contractor’s Qualification Statement (AIA Form A305)
☐ Schedule 2 – Proposed Subcontractor and Suppliers (1 Submitted with Proposal Documents)
☐ Schedule 3 – Non-Asbestos Materials Certifications (Submitted at Project Closeout)
☐ Schedule 4 - Felony Conviction Notification
☐ Schedule 5 - Hold Harmless Agreement
☐ Schedule 6 – Financial Statements
☐ Schedule 7 – Bonding and Insurance Certification
☐ Schedule 8 – Conflict of Interest Questionnaire
☐ HB 1295

SELECTION CRITERIA
Quantity Required – 3 COPIES

☐ Exhibit A – Relevant Experience
☐ Exhibit B – Project Management Ability
☐ Exhibit C – Past Performance

PROPOSAL FORMAT

1. The PROPOSAL SUBMISSION DOCUMENTS (all originals) should be submitted in a separate sealed envelope.
2. The SELECTION CRITERIA information and the SCHEDULES should be submitted in triplicate with section dividers (tabs) labeled accordingly; Exhibit A, Exhibit B, Exhibit C, Schedules 1, 4, 5, 6, & 7.
APPENDIX A  
MINIMUM WAGE RATE DETERMINATION  
FOR NORTHSIDE INDEPENDENT SCHOOL DISTRICT SCHOOL FACILITIES  
CONSTRUCTION BY CONTRACT  

November, 2004

Pursuant to the requirements of law and in compliance with Government Code, §2258.001 et seq., the following wage determination is issued as required by law applicable to the work described. This wage determination shall be made a part of the contract for the work for which it is issued. The wage rates contained in the determination, including modifications, if any, shall be the minimum to be paid by contractors and subcontractors to each worker employed by it in the execution of the work.

The contractor shall comply with all the requirements of Government Code §2258.001 et seq.

When the contractor or subcontractor proposes to utilize a particular class of laborers or workmen not listed in the wage determination, such workman or laborer shall be classified or reclassified conformable to the wage determination and a report made in writing of such action to the Owner. When the interested parties are unable to agree on the classification or reclassification of workmen, the question with recommendations of the parties shall be submitted to the Owner for determination. The decision of the authorized representative of the Owner shall be furnished the parties and shall be binding and final.

The contractor and each subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed by him, in connection with the said public work, and showing also the actual per diem wages paid to each of such workers, which record shall be open at all reasonable hours to the inspection of the Owner, its officers and agents.

LOCATION OF PROJECT: Northside Independent School District  
San Antonio, Bexar County, Texas

BUILDING CONSTRUCTION includes construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment or supplies, the installation of utilities, machinery and equipment, both above and below grade level, as well as incidental grading and paving.
## MINIMUM HOURLY WAGE RATE

### BUILDING CONSTRUCTION

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<th>Job Position</th>
<th>Hourly Wage</th>
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<tbody>
<tr>
<td>Air Conditioning Mechanic</td>
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<td>Air Conditioning Mechanic Helper</td>
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<tr>
<td>Bricklayer/Stone Mason</td>
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<tr>
<td>Carpenter, Form</td>
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<tr>
<td>Carpenter, Trim and Finish</td>
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<td>Electronic Technician</td>
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<td>Floor Layer, Resilient</td>
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<td>Glazier</td>
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<td>Operator, Forklift</td>
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<td>Waterproofer Installer</td>
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<td>Welder, Structural</td>
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### SITEWORK, PAVING, AND UTILITY CONSTRUCTION

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</tr>
<tr>
<td>Truck Driver, Tamdem Axle or Semi</td>
<td>$11.78</td>
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Any worker employed on this project shall be paid at the rate of one and a half (1-1/2) times the regular rate for every hour worked in excess of forth (40) hours per week.
Addendum
Clarifying that 2007 Edition of AIA Document A201, General Conditions of the Contract for Construction Will Be Used For All Purposes With Standard Form of Agreement Between Owner and Contractor
Administrative Upgrades at Adams Hill Elementary School

Owner and Contractor mutually acknowledge that notwithstanding any references contained in the Agreement to the 2007 Edition of AIA Document A201, General Conditions of the Contract for Construction (the “2007 General Conditions”), it is the express mutual intention of the parties that the 2007 Edition of AIA Document A201, General Conditions of the Contract for Construction (the “2007 General Conditions”) will be used for all purposes with respect to the Agreement. In this connection, the Architect shall have the right to make reasonable interpretations and/or determinations as to an appropriate corresponding section number reference in the 2007 General Conditions which will control whenever it is readily apparent that a specific reference has been made in the Agreement to a section in the 1997 General Conditions which has been renumbered or otherwise replaced with a different section in the 2007 General Conditions.

OWNER:
NORTHSIDE INDEPENDENT SCHOOL DISTRICT

By: __________________________________________
Name:    Leroy San Miguel
Title:  Assistant Superintendent for Facilities & Operations

CONTRACTOR:

By: ____________________________________________
Name:
Title:
SECTION 00700 – GENERAL CONDITIONS

PART 1 – GENERAL

American Institute of Architects, Document A-201, General Conditions of the Contract for Construction, 2007 Edition, (“General Conditions”), is hereby incorporated (in its entirety) and made a part of this Contract. Original document provided by the architect.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION
General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

SAMPLERS

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
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ARTICLE 1 GENERAL PROVISIONS
§ 1.1 BASIC DEFINITIONS
§ 1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect’s consultants or (4) between any persons or entities other than the Owner and the 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 of which the Work performed under the Contract Documents may be the whole or a part which may include construction by the Owner and 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 INSTRUMENTS OF SERVICE
Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect’s consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inerable from them as being necessary to produce the indicated results.
§ 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 that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION
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 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submission 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' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service 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.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

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 Section 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 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or
the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner 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.

§ 2.2.3 The Owner 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.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Contractor’s performance of the Work with reasonable promptness after receiving the Contractor’s written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, 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 Section 6.1.3.

§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-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, 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 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.

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 Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor’s authorized representative.

§ 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 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 or entities other than the Contractor.
§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 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.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 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 coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. 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.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 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 loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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

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

§ 3.4 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 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

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

§ 3.5 WARRANTY
The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that 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, NOTICES, AND COMPLIANCE WITH LAWS
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

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

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions, that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that 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, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that 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 promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume
the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 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; and
.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 Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 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.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner’s consent, which shall not unreasonably be withheld or delayed.

§ 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 expedient and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect’s approval. The Architect’s approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.
§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one 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 as a record of the Work as constructed.

§ 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 that 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. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 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 that 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 in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, 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.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that 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, 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 and approvals performed or
provided by such design professionals, provided the Owner and Architect have specified to the Contractor all
performance and design criteria that such service must satisfy. Pursuant to this Section 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 and design criteria specified in the Contract
Documents.

§ 3.13 USE OF SITE
The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes,
rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably
cumber the site with materials or equipment.

§ 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. All areas requiring cutting, fitting and patching shall be restored to the condition
existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 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
evacuation. 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 waste
materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about
the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner
shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever
located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS
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 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 information is promptly furnished to the
Architect.
§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, 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 Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 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 Section 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.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect 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 successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 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 during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed 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 not have control over, charge of, or responsibility 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 Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. 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, 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 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.

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

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness 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 Sections 3.3, 3.5 and 3.12. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; 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 pursuant to Section 9.10, and issue a final Certificate for Payment pursuant to Section 9.10.

§ 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 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.

§ 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 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 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.
§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

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 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 may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 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.

§ 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 responsibly in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS
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 that 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 Section 14.2 and only for those subcontract agreements that 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.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 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.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

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 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 Article 15.

§ 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. 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 Owner until subsequently revised.

§ 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 that 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.

§ 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 Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor’s delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 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 Section 3.14.

§ 6.3 OWNER’S RIGHT TO CLEAN UP
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 allocate the cost among those responsible.

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.

§ 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 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 The 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.

§ 7.3 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.

§ 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:
   .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
§ 7.3.4 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.

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

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

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment 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, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3, 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 Section 7.3.7 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.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that 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.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim 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 15.

§ 7.3.10 When the Owner and Contractor agree with a 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 the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK
The Architect has 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 will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
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 Section 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.

§ 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.

§ 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
§ 8.3.1 If the Contractor is 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 that 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.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 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
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
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT
§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. 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 shall reflect retainage if provided for in the Contract Documents.
§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay 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 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.

§ 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 Section 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 to the best of the Architect’s knowledge, information and belief, the Work has progressed to the point indicated and that 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 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 Section 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 Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the 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 Section 3.3.2, because of

1 defective Work not remedied;
2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate 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 repeated failure to carry out the Work in accordance with the Contract Documents.

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

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

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

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the 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.

§ 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 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. 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 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 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 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
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 binding dispute resolution, 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 shutdown, 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.

§ 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.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that 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 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 such acceptance and consent of surety, if any, the Owner shall make payment 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.

§ 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 Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. 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 Section 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.

§ 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.

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

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the 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.

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

ARTICLE 10  PROTECTION OF PERSONS AND PROPERTY
§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS
The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 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.

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§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on 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 Sections 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 Sections 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 Section 3.18.

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

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and 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), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor’s written notice, 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 cause it to be 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. By Change Order, 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.
§ 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 Section 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), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency 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.

§ 10.4 EMERGENCIES
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 Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in 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 and completed 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 that 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 Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction
of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. 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.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE
§ 11.3.1 Unless otherwise provided, the 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" 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 Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

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

§ 11.3.1.2 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 that 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.

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

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

§ 11.3.1.5 Partial occupancy or use in accordance with Section 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.

§ 11.3.2 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.

§ 11.3.3 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.

§ 11.3.4 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.

§ 11.3.5 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 Section 11.3.7 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.

§ 11.3.6 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 Section 11.3. 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.

§ 11.3.7 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, any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 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, 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.

§ 11.3.8 A loss insured under the 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 of Section 11.3.10. 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.

§ 11.3.9 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 as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. 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.

§ 11.3.10 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 in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND
§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 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 authorize a copy to be furnished.

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 requested 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.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of 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
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, the cost of uncovering and replacement, 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 Section 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 Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the 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 Section 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 that portion 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 Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that 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 that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 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
If the Owner prefers to accept Work that 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
The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS
§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, 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 a lender providing construction financing for the Project, if the lender assumes 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
Written notice shall be deemed to have been duly served if delivered in person to the individual, to 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 or by courier service providing proof of delivery 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.

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§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. 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 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 (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 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 Section 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 Section 13.5.3, shall be at the Owner’s expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 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.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest 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 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14  TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 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 that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that 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 Section 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

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 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, there were suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constituting 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 Section 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 executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 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 repeatedly 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 Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

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

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

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

§ 14.2.2 When any of the above-mentioned reasons exist, the Owner, upon certification by the Initial Decision Maker 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 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery theretofore owned by the Contractor;

.2 Accept assignment of subcontracts but subject to Section 5.4; and

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

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

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages 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 Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 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 increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or 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.

ARTICLE 15 CLAIMS AND DISPUTES
§ 15.1 CLAIMS
§ 15.1.1 DEFINITION
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, 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. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 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. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME
§ 15.1.5.1 If the Contractor wishes to make a 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.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.
§ 15.1.6 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 Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a 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 Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker’s sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker 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 Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner’s expense.

§ 15.2.4 If the Initial Decision Maker 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 (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.
§ 15.2.7 In the event of a Claim against the Contractor, 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 Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

§ 15.2.8 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.

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation, which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

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

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

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

§ 15.4.2 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.

§ 15.4.3 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.

§ 15.4.4 CONSOLIDATION OR JOINER
§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an
additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.
NORTHSIDE INDEPENDENT SCHOOL DISTRICT

SUPPLEMENTARY CONDITIONS

The following Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201-2007 (“General Conditions”). Where any article, paragraph, subparagraph or clause of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered provisions of that article, paragraph, subparagraph or clause shall remain in effect.

GENERAL PROVISIONS (Article 1):

1.1.1 Add the following to the end of the Subparagraph:

The Owner’s Special Conditions and the Bid or Proposal Documents prepared and submitted by the Owner and the Contractor’s Bid or Proposal submitted by the Contractor (to the extent such Bid or Proposal submitted by the Contractor is not inconsistent with other portions of the Contract Documents) shall be a part of the Contract Documents. Any reference in the Specifications to codes, standard specifications, or manufacturer’s instructions shall mean the latest printed edition of each in effect on the date that Contractor last submitted its bid or proposal for the Work, unless the date of the item is specifically noted.

1.1.2 Add the following to the end of the Subparagraph:

The Contract Documents and applicable Texas law comprise the entire agreement between the Owner and the Contractor and there are no conversations, understandings, agreements, conditions or representations, express or implied, with reference to the subject matter hereof that are not merged herein or superseded hereby. The Contract Documents may be amended only in a writing executed by duly authorized representatives of both the Owner and the Contractor.

1.1.3 Add the following to the end of the first sentence:

“. . ., including the transportation of materials and supplies to or from the site, competent supervision of the Work and the provision of insurance and payment and performance bonds in accordance with the Contract Documents.”

1.1.3.1 The term “provide” shall mean to furnish, install and complete, in place and ready for operation and use.
The “Initial Decision Maker” wherever referenced throughout the General Conditions, shall be hereby referenced as the Owner or Owner’s designated representative.

1.1.5.1 Add the following new Subparagraph:

Any discrepancy or conflict within or between the Drawings and Specifications shall be brought to the attention of the Architect. Notwithstanding Subparagraph 1.2.1, discrepancies or conflicts not brought to Architect’s attention and clarified during the bidding of the Project will be deemed to have been bid or proposed in the more costly or difficult manner, and the better quality or greater quantity of the Work shall be provided by the Contractor in accordance with Architect's interpretation.

1.2.3.1 Add the following new Subparagraph:

Subject to the terms of Subparagraph 1.1.5.1, in the event of conflicts or discrepancies among the Contract Documents, the following Contract Documents will be given the following priorities in resolving such conflicts or discrepancies:

(1) The Agreement between Owner and Contractor (the “Contract”)

(2) Addenda (with those of later date having precedence over those of earlier date)

(3) Supplementary Conditions

(4) Owner’s Special Conditions

(5) Specifications

(6) Drawings

(7) General Conditions

(8) Bid or Proposal Documents, including the Contractor’s Bid or Proposal Form (to the extent such Bid or Proposal submitted by the Contractor is not inconsistent with other portions of the Contract Documents)

OWNER (Article 2):

2.1.2 Subparagraph 2.1.2 is hereby deleted in its entirety.
2.2.1 Change current wording as follows:
Subparagraph 2.2.1 is hereby modified in its entirety to read as follows:

Prior to commencement of the Work the Contractor may request in writing that the Owner provide reasonable evidence that the Owner had made financial arrangements to fulfill the Owner’s obligations under the Contract. The Contractor shall provide a form acceptable to the Owner for the Owner to execute representing that the funds to fulfill the financial contractual obligation have been secured.

2.2.3 Subparagraph 2.2.3 is hereby modified in its entirety to read as follows:

The Owner may furnish surveys describing physical characteristics, legal limitations, and utility locations for the site of the Project, but the Owner shall have no duty to do so. The Contractor shall be responsible to independently investigate the physical characteristics, legal limitations, and utility locations for the site of the Project. In the event that the Contractor damages any utilities during construction, the Contractor, at its cost, shall immediately repair the same.

2.2.5 Change the Subparagraph to read as follows:

At the time of award of the Contract, the Contractor will be furnished, free of charge, up to thirty (30) complete sets of Drawings and Project Manuals. Additional sets of the Drawings or Project Manuals will be furnished to the Contractor at the request and expense of the Contractor, to be paid by the Contractor at the time such Drawings or Project Manuals are provided to the Contractor.

CONTRACTOR (Article 3):

3.1.1 Add the following to the end of the Subparagraph:

The Contractor shall at all times be an independent contractor, not an employee or agent of the Owner, and the relationship of the parties hereunder shall in no event be construed as constituting any other relationship.

3.3.1 The last sentence of Subparagraph 3.3.1 is hereby deleted.

3.3.1.1 On trench excavations in excess of five feet in depth, Contractor shall bear sole responsibility for design and execution of acceptable trenching and shoring procedures. Contractor shall pay a qualified engineer to prepare detailed plans and specifications directing Contractor in safe execution of trenching and shoring.
3.3.2 The following is hereby added to Subparagraph 3.3.2:

The Contractor shall ensure that the Project site is alcohol-free, drug-free, tobacco-free, weapon-free, and sexual-harassment free. In addition, the Contractor shall ensure that no person working under the Contractor or any of its subcontractors has been convicted of a felony or any crime involving moral turpitude. Contractor shall prohibit fraternization between all persons working under Contractor or any of its subcontractors and students while on Owner’s property.

3.3.4 Add a new Subparagraph as follows:

Contractor acknowledges that the Work may be performed in connection with an educational or other facility which may be currently occupied and in use. It is imperative that Contractor’s operations and the performance of the Work not interfere with, interrupt, disturb or disrupt Owner’s normal operations or facilities. Contractor agrees to and shall comply with all rules, regulations and requirements of the Owner and the school campus or facility on which the Work is to be performed, and shall take all steps necessary to protect and guard the safety of the employees, students and invitees of Owner. Contractor shall exercise the utmost skill and judgment to ensure that continuing construction activity will not interfere with the use, occupancy and quiet enjoyment of facilities in use on the site. Contractor recognizes that the ongoing activities in proximity with its construction activities shall result in the need for prompt and effective coordination of its services with those involved in the ongoing utilization of the premises. Such coordination and adequate site access shall be the responsibility of Contractor. Contractor understands and accepts the difficulties and costs associated with working in an existing facility and the potential delays and disruptions in its Work and has included such items in the Contract Time and the Contract Sum. The Contractor shall perform all the Work in such a manner as to cause minimum interference with the operations of the Owner and other contractors and subcontractors on the site, and shall take, and cause the Contractor’s and its Subcontractor’s employees, agents, licensees and permittees to take all necessary precautions to protect the Work and the site and all persons and property thereon from damage or injury. The Contractor shall maintain good order among its employees and those of its Subcontractors, and shall confine its employees to such work areas, roads and gates as directed by the Owner.

3.4.2.1 Add a new Subparagraph as follows:

Within thirty (30) days after the Contract has been executed, the Owner and the Architect will consider any formal request made by the Contractor for the substitution of products in place of those specified in the Contract Documents only if the Instructions to Bidders and/or Offerors for the
Project specifically permits the submission by Contractor of requests for substitutions.

If a request for substitution by Contractor is permitted, the Owner and the Architect may accept or reject any such request in their sole discretion. Requests for substitutions submitted after such thirty (30) day period will not be considered unless a product becomes impossible to obtain due to circumstances beyond the Contractor’s control.

By making requests for substitutions pursuant to this Subparagraph 3.4.2.1, the Contractor:

.1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;

.2 Represents that the Contractor will provide the same warranty for the substitution product that the Contractor would have provided for the product specified;

.3 Certifies that the cost breakdown presented with the request is complete and includes all related costs, except for the Architect’s redesign costs, if any, and waives all claims for additional costs related to the substitution which subsequently become apparent;

.4 Agrees to coordinate and supervise the installation of the proposed substitute, making such changes as may be required for the Work to be complete in all respects; and

.5 Agrees to reimburse Owner and Architect for review or redesign services associated with any re-approval by applicable governmental authorities related to the substitution.

Any request for substitution will include complete data substantiating compliance of the proposed substitution with the Contract Documents, together with a detailed breakdown of the cost of the project bid and the cost of the suggested substitution, which will include the cost of labor and materials and Contractor’s overhead and profit allocable thereto. Each request for substitution shall be submitted to the Architect with appropriate shop drawings, product data, and certified test results substantiating the proposed product equivalence. The Architect shall notify the Contractor in writing of its decision to accept or reject any request for substitution submitted by Contractor in accordance with this subparagraph 3.4.2.1.
3.5.1 Add the following at the end of the Subparagraph:

Neither the Owner’s or Architect’s inspection nor failure to inspect shall relieve the Contractor of any obligation hereunder. If any Work fails to conform to the Contract Documents, the Contractor shall promptly replace and remedy the same at the Contractor’s expense. No acceptance or payment by the Owner shall constitute a waiver of the foregoing and nothing herein shall exclude or limit any warranties implied by law.

3.6.2 Add a new Subparagraph as follows:

The Owner, as a tax-exempt organization, is not required to pay state sales tax. The materials to be used in the Work will be exempt from the limited sales, excise and use tax imposed by the Texas Tax Code. The Contractor shall obtain an exemption certificate evidencing exemption from such taxes from the local office of the State Comptroller of Public Accounts.

3.7.2 Delete the Subparagraph and replace with the following:

In performing its obligations hereunder, the Contractor shall comply fully with all applicable laws, ordinances, rules, regulations, lawful orders and decrees of all applicable authorities, and when requested shall furnish evidence satisfactory to the Owner of such compliance. The Contractor agrees to indemnify, defend and hold harmless the Owner, its trustees, officers, representatives, agents and employees from and against all claims, fines, penalties, or liabilities from, arising out of, or based upon the actual or asserted violation of any laws, ordinances, rules, regulations, orders or decrees.

The Contractor shall be responsible for compliance with all required provisions of Senate Bill 9 (81st Texas Legislative Session) at no additional cost to the Owner. Senate Bill 9 requires finger printing, background checks and registration through the Texas Department of Public Safety (DPS) of all employees of the Contractor, Subcontractors, and material and/or any other type suppliers who may enter any site where Northside ISD students are attending classes or are on the site for any purpose. The Contractor shall maintain all records of such finger printing and background checks through the DPS and make such available to the Owner within seventy-two (72) hours of request by the Owner. No person shall be permitted to work at any site where Northside ISD students are present until such time as finger printing and background checks have been completed. No additional compensation shall be provided by the Owner to the Contractor for any part of this requirement.
Without limiting the generality of the foregoing, the Contractor shall comply with all requirements of Chapter 2258 of the Texas Government Code, Prevailing Wage Rates, and the rules and regulations promulgated thereunder. The Contractor shall pay and cause all of its Subcontractors to pay not less than the general prevailing rate of per diem wages and the prevailing rate for legal holidays and overtime work in the locality of the Work for each type of workman needed to execute the Work. The Owner has ascertained such general prevailing rate of per diem wages and the prevailing rate for legal holidays and overtime work in the locality of the Work for each type of workman needed to execute the Work, and has set forth the same in the Contract Documents. The Contractor shall keep or cause to be kept, and shall cause each of its Subcontractors to keep or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed in connection with the Project, and showing also the actual per diem wages paid to each of such workers, which records shall be open at all reasonable hours to the inspection of the Owner, its officers or agents. The Contractor shall cause each of its Subcontractors to submit to the Contractor, with each request for payment, certified copies of such records. At the request of the Owner, the Contractor will provide the Owner with certified copies of its records of per diem wage paid to its employees, together with copies of its Subcontractor’s records. The Contractor shall forfeit to the Owner the statutory penalty provided for each laborer, workman or mechanic employed, for each calendar day or portion thereof that such laborer, workman or mechanic is paid less than the stipulated prevailing rates for any Work performed by the Contractor or any Subcontractor. In addition, the Contractor shall be responsible to pay the Owner, upon Owner’s written demand, the sum of $60.00 per diem for each day during which a violation of this paragraph occurs.

3.7. Claims for Concealed or Unknown Conditions. Contractor acknowledges that there may exist at the project site certain soil and geological conditions and/or subsurface physical, structures, equipment, utilities, and/or other conditions which are not disclosed in the Contract Documents, and which have been known to or may be reasonably anticipated to occur in the area or be related to any past use of the project site, including, without limitation, the presence of rock and its hardness, geologic formations, differing soils, and subsurface structures, equipment, utilities, or other impediments, either natural or man-made (collectively, “Subsurface Conditions”). Owner makes no representations or warranties regarding Subsurface Conditions at the Project site, or of the accuracy or continuity of conditions which may be noted in any reports furnished or made available to Contractor. Contractor covenants and agrees that any such reports are furnished or made available by Owner to Contractor for information purposes only, and Contractor acknowledges that Owner is not responsible for the content thereof. Contractor shall be responsible for
inspecting the site and determining the existence or likelihood of any Subsurface Conditions which may affect the Contract Time or the Contract Sum, or both. The Contract Time and the Contract Sum bid by Contractor shall be deemed to include all costs of and time to complete all work associated with or attributable to Subsurface Conditions, and Contractor shall not be entitled to submit a claim for or to obtain an extension of the Contract Time or increase in the Contract Sum due to the existence of Subsurface Conditions.

Except as provided above with respect to Subsurface Conditions, if conditions are encountered at the site which are (1) concealed physical conditions which, in the opinion of the Architect, differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which, in the opinion of the Architect, 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 Contractor or Owner, as applicable, shall be given to the other promptly before conditions are disturbed and in no event later than 21 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 days after the Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

3.9.2 Change as follows:

The first sentence of the Subparagraph is deleted and replaced with the following:

Contractor shall provide adequate supervision at the jobsite at all times. The Architect and Owner shall determine adequacy of supervision. At least on full-time job superintendent shall be provided. The job superintendent shall be approved by the Owner and Architect as follows, and will be replaced by the Contractor upon request by the Owner.
3.12.7 Add the following:

The Contractor shall proceed at its own risk by performing any Work for which the Contract Documents require submittal review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

3.13.1 Add the following at the end of the Subparagraph:

The Contractor shall so conduct its operations as not to unreasonably interfere with traffic on public thoroughfares adjacent or near to the Project site.

3.18.1 Delete the Subparagraph and replace with the following:

TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS THE OWNER, ARCHITECT, THEIR RESPECTIVE TRUSTEES, OFFICERS, EMPLOYEES, REPRESENTATIVES AND AGENTS, FROM AND AGAINST ALL SUITS, DEMANDS, CLAIMS, CAUSES OF ACTION, DAMAGES, LOSSES, FINES, PENALTIES, COSTS AND EXPENSES (INCLUDING LEGAL FEES AND COURT COSTS) CAUSED BY, RESULTING FROM, ARISING OUT OF, OR OCCURRING IN CONNECTION WITH THE PERFORMANCE OF THE WORK OR COMPLIANCE (OR FAILURE TO COMPLY) WITH THE TERMS OF THIS AGREEMENT, EVEN THOUGH SUCH LOSS, COST, DAMAGE INJURY, CLAIM, DEMAND, SUIT OR EXPENSE MAY BE ATTRIBUTABLE TO THE JOINT, CONCURRENT, COMPARATIVE OR CONTRIBUTORY NEGLIGENCE OF ANY PARTY INDEMNIFIED HEREBY (BUT NOT THE SOLE NEGLIGENCE OF ANY SUCH PARTY). THE LIABILITY OF THE CONTRACTOR, ITS AGENTS, SERVANTS, EMPLOYEES, OR SUBCONTRACTORS HEREUNDER SHALL NOT BE LIMITED TO ANY MINIMUM INSURANCE LIMITS SET FORTH IN THE CONTRACT DOCUMENTS. THE OWNER MAY, AT ITS OPTION, PARTICIPATE IN THE DEFENSE OF ANY SUCH CLAIM OR SUIT WITHOUT RELIEVING THE CONTRACTOR OF ANY OBLIGATION HEREUNDER. SUCH OBLIGATION SHALL NOT BE CONSTRUED TO NEGATE, ABRIDGE OR REDUCE ANY OTHER RIGHTS OR OBLIGATIONS OF INDEMNITY WHICH WOULD OTHERWISE EXIST AS TO ANY PARTY OR PERSON DESCRIBED IN THIS PARAGRAPH. INDEMNIFICATION HEREUNDER SHALL INCLUDE, WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, LIABILITY WHICH ARISES OR COULD ARISE PURSUANT TO THE PROVISIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, AS AMENDED (29 U.S.C. SECTION 652 ET SEQ.), AND ALL OTHER LAWS, RULES AND REGULATIONS FOR THE PROTECTION, SAFETY AND HEALTH OF WORKMEN, IT BEING
AGREED THAT, AS BETWEEN THE OWNER AND THE CONTRACTOR, THE CONTRACTOR IS PRIMARILY LIABLE FOR COMPLIANCE WITH SAID STATUTES.

The Contractor represents that it possesses the skills required for the Work, assumes the responsibilities of an employer for performance of the Work, and acts as an employer of one or more employees by paying wages, directing activities, and performing other similar functions. The Contractor is an independent contractor, free to determine the manner in which the Work is performed. The employees of the Contractor are not employees of the Owner, and the Owner shall have no responsibility to maintain Workers' Compensation Insurance for the employees of the Contractor, the Contractor having sole responsibility therefor. The Contractor agrees, at the request of the Owner, to execute a written agreement in the form promulgated by the Texas Department of Insurance - Division of Workers' Compensation, stating that the Contractor is an independent contractor, not an employee of the Owner, and that neither the Contractor nor its employees are entitled to Workers' Compensation coverage from the Owner.

4.2.1 Add the following:

The Architect will provide administration of the Contract as described in the Contract Documents, and will act as an Owner's representative (1) during construction, (2) until the date the Architect issues the final Certificate for Payment, and (3) from time-to-time during the one-year period for correction of Work (warranty period) described in Section 12.2 The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

ADMINISTRATION OF THE CONTRACT (Article 4):

4.2.6 Add the following at the end of the Subparagraph:

Certain portions of the Work will be tested and/or observed at various stages, sometimes off the Project site, between initial observation or review and final positioning of the completed Work. Nothing in any initial or prior approval or test result shall govern if at any subsequent time the Work or any portion thereof is found not to conform to the requirements of the Contract Documents.

4.2.7 Delete the Subparagraph and replace with the following:

The Architect will review and comment 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 the design concept expressed in the Contract Documents. The Architect’s action will be taken with reasonable promptness as to cause no delay in the Work or in the activities of the Owner 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, or for coordination of the various trades, or for compliance with schedules, all of which remain the sole 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 its obligations under Paragraphs 3.3, 3.5 and 3.12. The Architect’s review shall not constitute consideration or approval of safety precautions or, unless otherwise 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. If, on occasion, the Architect reviewed and/or commented upon items or subjects which are the responsibility of the Contractor, such action shall be interpreted as voluntary assistance by the Architect, and shall not create a duty or obligation upon the Architect to provide similar review and comment on other items or subjects.

4.2.11 Delete the Subparagraph and replace with the following:

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 five (5) business days after request therefor, unless the Architect advises the Contractor and the Owner, within such five (5) day period, that additional time will be required.

SUBCONTRACTORS (Article 5):

5.2.4 Subparagraph 5.2.4 is hereby deleted in its entirety, and replaced with the following:

The Contractor shall notify the Owner prior to changing any subcontractor, person, or entity previously selected to perform Work on the Project or to supply materials to the Project, and the provisions of Subparagraph 5.2.1 shall apply to the proposed replacement.

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS (Article 6):

6.2.3 Subparagraph 6.2.3 is hereby deleted in its entirety, and is hereby replaced with the following:
Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible for the same.

**CHANGES IN THE WORK (Article 7):**

**7.1.4** A new Subparagraph 7.1.4 is added to provide as follows:

Contractor must respond to each Proposal Request within 10 working days after receiving the same. If the Owner does not receive a Proposal or other written response to the Proposal Request within such timeframe, then the Contractor shall provide the services described in the Proposal Request at no additional charge to the Owner.

**7.2.2** A new Subparagraph 7.2.3 is added, to provide as follows:

Requests for a Change Order from the Contractor due to the discovery by the Contractor of an unexpected or unforeseeable condition at the Project site must be submitted to the Owner and the Architect within 21 calendar days after the discovery by the Contractor of such condition. If the Owner and Architect are not so notified within such 21 calendar days time frame, then the Contractor shall be responsible for any additional construction costs associated with the unexpected or unforeseeable condition at the Project Site.

**7.3.5** The word “promptly” in Subparagraph 7.3.4 is hereby replaced with the word “immediately.” Any adjustment in the Contract Sum related to a Construction Change Directive shall not exceed the Contractor’s last estimate of such increase.

**7.3.7** Delete the word “an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount”, and substitute the phrase “an allowance for overhead and profit as set forth in Subparagraph 7.3.11.

**7.3.11** Add the following as a new Subparagraph 7.3.10:

In Subparagraph 7.3.6, the allowance for the combined overhead and profit included in the total cost to the Owner shall be based upon the following schedule:

1. For the Contractor, for Work performed by the Contractor’s own forces, fifteen percent (15%) of the cost (but zero percent (0%) for change orders to be paid out of any contingency allowance).
For the Contractor, for the Work performed by the Contractor’s Subcontractors, five percent (5%) of the amount due the Subcontractors (0% for the change orders to be paid out of any contingency allowance).

For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor’s or Sub-subcontractor’s own forces, fifteen percent (15%) of the cost.

The costs to which the above percentages shall be applied will be determined in accordance with Subparagraph 7.3.6.

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 quantities and unit costs of labor and materials, extended and totaled.

The Contractor is entitled to no allowance for combined overhead and profit for Change Orders to be paid out of a contingency allowance.

7.3.12 Add the following as a new Subparagraph:

When Change Orders are indicated to be paid from a contingency allowance, if any, identified in the Contract Documents, the Contractor’s supervision and all other overhead items and profit shall be deemed to be included in the Contract Sum, and not in the contingency allowance.

TIME (Article 8):

8.2.1 The Date of Commencement of Work shall not be before the Notice to Proceed is issued. Contractor shall not be entitled to any delay days for any period between the Contractor’s receipt of the Notice of Award and the Contractor’s receipt of the Notice to Proceed. The Contractor must anticipate that the Contractor shall not receive the Notice to Proceed until 60 to 120 days after the Contractor’s receipt of the Notice of Award.

8.3 Delete the Paragraph (Subparagraphs 8.3.1, 8.3.2 and 8.3.3) and replace with the following:

If the Contractor is delayed at any time in the commencement or progress of the Work because of changes ordered in the Work or because of strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties, unusual inclement weather, or other causes beyond the Contractor’s control which constitute a justifiable delay, the Contract Time may be extended, as the Contractor’s sole and exclusive remedy for such
delay. Extended general conditions (or any other amounts) will not be considered or paid for extensions of time. The Owner will extend the Contract Time by Change Order subject to the following:

.1 Claims for extension of time must be made in writing on or before the due date of Contractor's Application for Payment covering the period in which the delay began. In the case of a continuing cause of delay, only one claim is necessary.

.2 Claims for extension of time shall be stated in whole or half calendar days, as applicable. The actual date on which the delay(s) occurred must be stated in the claim.

.3 When establishing the Contract Time, the Owner and the Contractor have taken into consideration the normal number of days of inclement weather for each month during which the Project shall be constructed. A list of the normal inclement weather days for each such month is included in the Contract Documents. In case of claims for extension of time because of unusual inclement weather, that is, a number of inclement weather days greater than normal as set out in the Contract Documents, such extension of time will be granted only to the extent that such unusual inclement weather prevented the execution of Work on normal working days and affected the critical path of the work. “Normal working days” will be Mondays through Fridays, exclusive of legal holidays. “Unusual inclement weather” as used herein means unusually severe weather which is beyond the normal weather recorded and expected for the locality of the Work and/or the season or seasons of the year. Normal weather conditions shall be determined based upon information compiled from the records at the location of the Work. If unusually inclement weather conditions are the basis for a claim for additional time, such claim shall be documented by data substantiating such conditions, the fact that the same could not have been reasonably anticipated, and the fact that such conditions had an adverse effect on the scheduled construction.

.4 Any claim for extension of time for strikes or lockouts shall be supported by a statement of facts concerning the strike, including the dates, the craft concerned, the reason for the strike, efforts to resolve the dispute, and the efforts of the Contractor to minimize the impact of the strike upon progress of the Work.

.5 Any claim for extension of time for delays in transportation shall be supported by a statement of facts demonstrating that the delays are beyond the Contractor’s control, and reciting the Contractor's efforts to overcome such delays.
The cost of all performance bonds and payment bonds, whether procured by the Contractor or any subcontractor, is included in the Contractor’s overhead and profit.

8.4 Add the following new paragraph:

Acceleration to Meet Schedule. In the event of any delay in the progress of the Work with respect to which Contractor is not entitled to an extension of time under the terms hereof, or in the event that the Owner reasonably believes that the Project will not be completed within the Contract Time without acceleration, Owner may direct that the Work be accelerated by means of overtime, additional crews or additional shifts or resequencing of the Work. All such acceleration shall be at no cost to Owner.

PAYMENTS AND COMPLETION (Article 9):

9.1.1 Add the following:

All costs of overtime work required by the Contract Time and the nature of the Work, as set forth in or inferable from the Contract Documents, except costs of emergencies covered in Paragraph 10.4, shall be and are included in the Contract Sum. The Contract Sum shall not be increased because the Contractor experiences an unexpected or unforeseeable increase in the price of labor or materials required to complete the Project.

9.3.1 Change “ten days” to “seven calendar days.”

9.3.1.3 Add the following as a new Clause to Subparagraph 9.3.1:

Along with the Application for Payment, and as a condition to the payment of any amounts stated therein, the Contractor will comply with Chapter 8 of the Owner’s Special Conditions, and will submit the following:

.1 An Affidavit certifying that payment has been made to all Subcontractors, Sub-subcontractors, suppliers, employees, materialman and other persons relating to Work for which the Contractor has been paid; and

.2 A revised and updated Construction Schedule reflecting actual job progress to the date of the Application for Payment, taking into account all factors known at the time of such Application for Payment.

.3 Payment shall be made on the percentage of value of the Work actually performed and included in the Application for Payment, as specified in Article 5 of the Agreement.
9.3.1.4 Add the following as a new clause to Subparagraph 9.3.1:

Until Substantial Completion, the Owner will pay 95 percent of the amount due the Contractor on account of progress payments.

9.5.4 The progress of construction must not lag behind the construction progress schedule approved by the Owner. If the construction or any portion or phase thereof falls behind the schedule approved by the Owner, further payment may be withheld until the pace of construction is accelerated to the satisfaction of the Owner to meet the scheduled Contract Time.

9.7 Subparagraph 9.7 is hereby modified as follows:

Delete the term “or awarded by binding dispute resolution: in the first sentence.

9.8.5 Add the following to the end of the Subparagraph:

The payment shall be sufficient to increase the total payments to 95 percent of the Contract Sum, less amounts as the Architect shall determine for all incomplete Work and unsettled claims.

9.10.6 Add the following as a new Subparagraph:

The Contractor shall not permit any actual or purported lien, charge or claim to attach or attempt to attach to the Work, the site or any amounts due or to become due to the Contractor under the Contract Documents. If any such lien, charge or claim is so asserted, the Contractor shall promptly procure its release and indemnify the Owner against all damage and expense incident thereto. Upon completion of the Work and before any final payment and settlement, the Contractor shall provide evidence satisfactory to the Owner of payment and release of all debts, taxes, liens, charges, obligations and claims for or relating to labor, materials, Subcontractors and Sub-subcontractors; provided, however, that if the Contractor has not paid for any of the aforesaid as a result of a bona fide dispute, and payment of such is guaranteed and covered by the payment bond provided by the Contractor, then the Contractor shall not be required to pay such claim as a condition to final payment and settlement, but instead shall be required to provide Owner with written consent to final payment executed by such surety, expressly acknowledging the existence of such unpaid claim, and agreeing that full and final payment to the Contractor shall not impair any of the Owner’s rights or the surety’s obligations under the bond.

PROTECTION OF PERSONS AND PROPERTY (Article 10):

10.3. Subparagraph 10.3.3 is hereby deleted in its entirety.
10.3.4 Subparagraph 10.4 is hereby modified in its entirety to read as follows:

Owner shall not be responsible for materials or substances brought to the site by the Contractor.

10.3.6 Subparagraph 10.3.6 is hereby deleted in its entirety.

10.5 Subparagraph 10.5 is hereby deleted in its entirety.

INSURANCE AND BONDS (Article 11):

Add the following Subparagraphs:

11.1.2.1 Minimum coverages and limits required of the Contractor are as follows:

.1 Workers’ Compensation: Statutory Limits

Employers’ Liability:

$500,000 each accident;
$500,000 disease - policy limit;
$500,000 disease - each employee.

.2 Commercial General Liability Insurance:

$2,000,000 general aggregate;
$1,000,000 products/completed operations aggregate;
$1,000,000 personal and advertising injury;
$1,000,000 each occurrence;
$50,000 fire damage;
$5,000 medical expense.

Such policy shall include all of the coverages which may be included in coverages A, B and C contained in the Standard Texas Form Commercial General Liability Policy, without deletion. Such policy must be issued upon an “occurrence” basis, as distinguished from a “claims made” basis.

.3 Comprehensive Automobile Liability Insurance to cover all vehicles (any auto) owned by, hired by or used on behalf of the Contractor, with minimum Combined Single Limit of $1,000,000.00.

.4 Owner’s and Contractor’s Protective Liability Insurance:
$500,000 bodily injury;
$500,000 property damage.

Such policy must contain an endorsement to the effect that the insurance company waives its right to use as a defense the Owner’s governmental immunity.

.5 Umbrella Liability Insurance written on an occurrence basis, with minimum limits in the amount of:

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<td>3,000,000</td>
</tr>
<tr>
<td>$7,500,000 and over</td>
<td>4,000,000</td>
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.6 Should the Contractor fail to purchase, or fail to continue to force until completion of the Work, insurance in the amounts indicated above, the Owner may purchase such insurance and the cost thereof shall be borne by the Contractor, and may be deducted from any amounts owed by the Owner to the Contractor.

11.1.3 Change the first and second sentences of the Subparagraph to read as follows:

Certificates of Insurance acceptable to the Owner shall be filed with the Owner within ten (10) days after award of the Contract to Contractor and prior to commencement of the Work. The Certificates shall be ACORD Form 25, accompanied by a completed AIA Document G715, Instruction Sheet and Attachment for ACORD Certificate of Insurance. 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 cancelled, materially modified, or allowed to expire until at least thirty (30) days’ prior written notice has been given to the Owner.

Add the following at the end of the Subparagraph:

The provisions of this Subparagraph 11.1.3 shall apply to all policies of insurance required to be maintained by the Contractor pursuant to the Contract Documents.

Add new Subparagraphs as follows:

11.1.5 The Contractor shall cause the Subcontractors employed by the Contractor to furnish and maintain the following types and amounts of
insurance, with any specific coverages and endorsements reasonably requested by the Owner:

.1 **Workers’ Compensation**: Statutory Limits

   **Employers’ Liability**: $100,000

.2 **Commercial General Liability Insurance**:

   $500,000 general aggregate

.3 **Comprehensive Automobile Liability Insurance**:

   $250,000 per person/accident

11.1.6 All insurance policies and bonds shall be provided by a company or companies with a rating of not less than B+ in the last available Best’s Rating Guide. All such policies shall include clauses whereby each underwriter agrees to waive its rights of subrogation against the Owner. The Commercial General Liability, Automobile Liability and Umbrella Liability policies shall be endorsed to add the Owner as an additional insured. The limits of liability shown for each type of insurance coverage to be provided by the Contractor pursuant hereto shall not be deemed to constitute a limitation of the Contractor’s liability for claims hereunder or otherwise. Notwithstanding anything herein to the contrary, the Owner may to the fullest extent permitted by applicable law, accept alternate or different coverages for the insurance specified herein upon receipt from a licensed insurance agent or company acceptable to Owner of a written evaluation of the proposed alternate coverage in form acceptable to Owner confirming that such alternate coverage provides comparable or greater protection to the Owner as the coverage specified.

11.2 Subparagraph 11.2.1 is hereby deleted in its entirety.

11.3.1 Change the Subparagraph to read as follows:

The Contractor shall purchase and maintain an “All Risk” Builders Risk policy covering the entire Work at the site for the full insurable value of the Work, including transit thereto and including materials stored off-site and destined to become a part of the Work. Such policy shall be maintained until final payment is made to the Contractor pursuant to Article 9. Such policy shall include an endorsement allowing occupancy of the Project, in part or whole, by the owner prior to final completion of construction. No deductibles shall exceed $5,000
without the prior written approval of the Owner. The policy shall insure the respective interests of the Owner and the Contractor in the Work.

11.3.1.2, 11.3.1.3, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, and 11.3.7: Delete these Subparagraphs in their entirety.

11.4.8 Change 11.4.8 to 11.3.8 and 11.4.9 to 11.3.9. Also change 11.4.9 in the body of the paragraph to 11.3.9.

11.4.8 and 11.3.9: Change the words “the Owner’s” and “the Owner” to read “the Contractor’s” and “the Contractor,” except in the last sentence of Subparagraph 11.3.9

11.3.9 Change Subparagraph as follows:

Delete the term “or as determined in accordance with the method of binding dispute resolution selected”.

11.4.10 Change to 11.4.10 to 11.3.10 in each case. Also add a second paragraph with the following:

Delete the term "by the Owner and Contractor as the method of binding dispute resolution in".

11.3.10 Subparagraph 11.3.10 is hereby modified in its entirety to read as follows:

The Owner shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within 5 days after the occurrence of the loss to the Owner's exercise of this power.

11.4.1 Change the Subparagraph to read as follows:

Prior to executing the Agreement and commencing any Work, the Contractor shall furnish to Owner, at the Contractor’s expense, a payment bond (if the Contract Sum exceeds $25,000.00) and a performance bond (if the Contract Sum exceeds $100,000.00), each such bond to be in the amount of 100% of the Contract Sum, issued by such corporate sureties duly authorized and admitted to do business in the State of Texas and licensed by the State of Texas to issue surety bonds and in accordance with the requirements of Chapter 2253 of the Texas Government Code, Public Work Performance and Payment Bonds. If the Contract Sum exceeds the underwriting limitation of the surety the Contractor shall provide the Owner with evidence that the excess is protected by re-insurance or co-insurance in a form and amount acceptable to the Owner. If the amount of the bond (whether
payment or performance) exceeds $100,000.00, then the surety must also hold a certificate of authority from the United States Secretary of the Treasury to qualify as a surety on obligations permitted or required under federal law; or have obtained reinsurance for any liability in excess of $100,000.00 from a reinsurer that is authorized and admitted as a reinsurer in the State of Texas and who is a holder of a certificate of authority from the United States Secretary of the Treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law. The Contractor shall require any attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto an original certified and current copy of a Power of Attorney evidencing the authority of such attorney-in-fact to so execute such bonds, indicating the monetary limit of such power and authority.

11.4.3 Add the following as a new Subparagraph 11.5.3:
By inclusion of this Subparagraph 11.5.3 in the Contract Documents, the surety which issues the bonds is hereby notified that the Owner, the Architect, and their agents and employees do not represent and will not be responsible for the surety’s interests during the course of the Work. To protect its interests, the surety shall have the right to attend pay estimate meetings, review Applications for Payment when requested in writing by them, comment upon and make recommendations regarding payments, and inspect the Work in the presence of the Contractor and the Architect. By providing the bonds for the Work, the surety shall and hereby waives any cause of action against the Owner, the Architect, their agents and employees, for any loss suffered by the surety by reason of overpayment of any amounts to the Contractor, unless such is a direct result of a fraudulent or grossly negligent act committed by such party.

Add the following as a new Subparagraph:

11.6 Change all items starting with “11.6” to begin with “11.5” hereafter. Applies to 12 lines

11.5 Workers’ Compensation

11.5.1 Definitions:

.1 Certificate of coverage (“certificate”) - a copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Department of Insurance - Division of Workers’ Compensation, or a coverage agreement on a form issued by such Division showing statutory workers’ compensation insurance coverage for the person’s or entity’s employees providing services on the Project, for the duration of the Project.
.2 Duration of the Project - includes the time from the beginning of the Work on the Project until the Contractor's Work on the Project has been completed and accepted by the Owner.

.3 Persons providing services on the Project ("subcontractor" in Texas Labor Code, §406.096) - includes all persons or entities performing all or part of the services the Contractor has undertaken to perform on the Project, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project.

.4 Services - includes, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services related to the Project. Services do not include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

11.5.2 The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the Contractor providing services on the Project, for the duration of the Project.

11.5.3 The Contractor must provide a certificate of coverage to the Owner prior to being awarded the Contract.

11.5.4 If the coverage period shown on the Contractor's current certificate of coverage ends during the duration of the Project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with Owner showing that coverage has been extended.

11.5.6 The Contractor shall obtain from each person providing services on a Project, and provide to Owner:

.1 A certificate of coverage, prior to that person beginning work on the Project, so the Owner will have on file certificates of coverage showing coverage for all persons providing services on the Project; and
.2 No later than seven (7) days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the Project.

11.5.7 The Contractor shall retain all required certificates of coverage of the duration of the Project and for one year thereafter.

11.5.8 The Contractor shall notify the Owner in writing by certified mail or personal delivery, within 10 days after the Contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project.

11.5.9 The Contractor shall post, on each Project site, notice, in the text, form and manner prescribed by the Texas Workers’ Compensation Commission, informing all persons providing services on the Project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

11.5.10 The Contractor shall contractually require each person with whom it contracts to provide services on a Project, to:

.1 Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the Project, for the duration of the Project;

.2 Provide to the Contractor, prior to that person beginning work on the Project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the Project, for the duration of the Project;

.3 Provide the Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the Project;

.4 Obtain from each other person with whom it contracts, and provide to the Contractor:

(a) a certificate of coverage, prior to the other person beginning work on the Project; and
(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the Project;

.5 Retain all required certificates of coverage on file for the duration of the Project and for one (1) year thereafter or until the expiration of the subcontractor's warranty period, whichever is longer;

.6 Notify the Owner in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project; and

.7 Contractually requires each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

11.5.11 By signing this Contract or providing or causing to be provided a certificate of coverage, the Contractor represents to the Owner that all employees of Contractor who will provide services on the Project will be covered by workers' compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the Commission's Division of Self-Insurance Regulation. Contractor acknowledges that providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

11.5.12 The Contractor’s failure to comply with any of these provisions is a breach of contract by the Contractor which entitles the Owner to declare the Contract void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

UNCOVERING AND CORRECTION OF WORK (Article 12):

12.2.2.1 Subparagraph 12.2.2.1 is hereby modified by deleting the second to the last sentence of that Subparagraph.

MISCELLANEOUS PROVISIONS (Article 13):

13.1.1 Subparagraph 13.1.1 is hereby modified to read as follows:
The Contract shall be governed by the law of the place where the Project is located.

13.2.2 Subparagraph 13.2.2 is hereby deleted in its entirety.

13.7.1.1, 13.7.1.2 and 13.7.1.3 Modify so there is a single 13.7 heading and each subparagraph heading 13.7.1, 13.7.2 and 13.7.3 using the same text.

Note: All items hereafter are new.

13.7.1 Subparagraph 13.7.1 is hereby modified in its entirety to read as follows:

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 on the later of the date of Substantial Completion or the date of discovery;

13.7.2 Subparagraph 13.7.2 is hereby modified in its entirety to read as follows:

Between Substantial Completion And Final Certificate For Payment. Between Substantial Completion and Final Certificate For Payment. As to acts or failure 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 limitation shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events on the later to occur of the date of issuance of the Final Certificate for Payment, or the date of discovery; and

13.7.3 Subparagraph 13.7.3 is hereby modified in its entirety to read as follows:

After Final Certificate For Payment. 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 limitation 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 hereunder, the date of any correction of the Work or failure to correct the Work by the Contractor hereunder, or the date of actual commission of any other act or failure to perform any duty or obligation by the
Contractor or Owner, or the date of discovery, whichever occurs last.

13.8.1 A new Paragraph 13.8 is added as follows:

Contractor and Contractor's subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin.

13.8.2 Contractor and Contractor’s subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf in connection with the Project, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

TERMINATION OR SUSPENSION OF THE CONTRACT (Article 14):

14.1.1.4 Subparagraph 14.1.1.4 is hereby deleted in its entirety:

14.2.1.5 Add a new Subparagraph as follows:

or any Subcontractor becomes insolvent, enters bankruptcy, receivership or other like proceeding (voluntarily or involuntarily), or makes an assignment for the benefit of creditors, and the Contractor, within fifteen (15) days after receipt of notice from the Owner, fails to provide satisfactory evidence that the Contractor will either (i) perform the Work of such Subcontractor with the Contractor's own forces, in a timely manner, or (ii) replace the Subcontractor with another similarly qualified subcontractor who is ready, willing and able to do such Subcontractor's Work in a timely manner.

14.2.2 Add the following at the end of the Subparagraph:

In any such event, title to the Work and any products thereof, whether completed or partially completed, as well as all materials prepared, procured or set aside by the Contractor for use in the Work, shall vest in the Owner at the Owner’s option, and the Owner may enter the Contractor’s premises and remove the same therefrom. No election hereunder shall be construed as a waiver of any rights or remedies of the Owner with regard to any breach of the Contract Documents.

14.4.3 Subparagraph 14.4.3 is hereby modified in it entirety to read as follows:

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed
payment for specially ordered and shipped products for the Project, and an amount equal to ten percent (10%) of the reasonably estimated Pay Applications for the then next succeeding three months.

CLAIMS AND DISPUTES (Article 15):

15.1 Wherever the term “Initial Decision Maker” appears it shall mean “Owner” or “Owner’s designated representative” anywhere within this Article.

15.1.2 Delete Subparagraph 15.2 and replace with the following:

Claims by the Contractor must be initiated by written notice to the Owner with a copy sent to the Architect. Claims must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the Contractor first recognizes the condition giving rise to the Claim whichever is later. Failure to make a claim within the prescribed period will result in the claim not being allowed.

The Owner may make a claim at any time during the entirety of the contract and warranty period, and will endeavor to give notice to the Contractor, with a copy sent to the Architect, within 21 days of the time the condition giving rise to the Claim in first recognized. The period to make claim shall not in any way diminish the Owner’s right to seek remedy due to the statute of limitation for failure to adequately complete the Work as contracted.

15.1.5 Delete Subparagraphs 15.1.5.1 and 15.1.5.2 in its entirety and replace with the following:

No increase in the Contract Time will be allowed except as otherwise expressly provided in Paragraph 8.3 above.

15.1.6 Delete Subparagraphs 15.1.6 in its entirety and replace with the following:

In the event the Contractor fails to achieve Substantial time, the Owner will be damaged thereby. The Contractor and Owner jointly agree that the amount of said damages is difficult if not impossible of definite ascertainment and proof. The Contractor and Owner hereby agree that the sum of $1,250.00 per calendar day, starting on the first day of the delay and ending on the day Substantial Completion of the entire work is declared, is a reasonable and appropriate set amount of the damages which will be incurred by the Owner for each day of
delay. The Contractor recognizes this amount is liquidated damages and not a penalty of any kind.

In the event that the Contractor achieves Substantial Completion then fails to complete all punch list items satisfactorily within the prescribed period for completion of the punch list, the Owner may reinstate claim for liquidated damages at the rate of $250.00 per consecutive calendar day until the punch list is complete.

The Contractor agrees that any liquidated damages due under this Contract shall be deducted from amounts due under the Contract, or if no further sums are due the Contractor hereunder, Contractor agrees to pay to the Owner such liquidated damages as shall be due hereunder for such delay within ten (10) days after receipt of demand thereof. Contractor further agrees that if it fails to pay the Owner such liquidated damages within ten (10) days following the Owner's demand thereof, the Contractor shall be liable to the Owner for interest at the statutory rate on said sum, plus any related costs of collection, including attorney's fees.

15.2 Wherever the term “Initial Decision Maker” appears it shall mean “Owner” or “Owner’s” designated representative anywhere within Article.

15.2.1 Delete Subparagraph 15.2.1 in its entirety and replace with the following:

Decision of Architect. Claims, excluding those arising under Section 1.3, 10.4, 11.3.9 and 11.3.10, shall be referred initially to the Architect to initial decision. Except for those claims excluded by Section 15.2.1, an initial decision by the Architect shall be required as a condition precedent to mediation, of any Claim 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 rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

15.2.2 Change the term “Initial Decision Maker” to “Architect” in each location.

15.2.3 Change the term “Initial Decision Maker” to “Architect” in each location.

15.2.4 Change the term “Initial Decision Maker” to “Architect” in each location.
15.2.5 Change the term “Initial Decision Maker” to “Architect” in each location.

15.2.6 Paragraph 15.2.6 and Subparagraph 15.2.6.1 are deleted in their entirety.

15.2.8 Subparagraph 15.2.8 is hereby deleted in its entirety.

15.3 Paragraph 15.3 and Subparagraphs 15.3.1 and 15.3.2 are hereby deleted in their entirety.

Mediation and any other terms of the General Condition requiring Mediation are deleted in their entirety, and is not required that any controversy or claim arising under any of the Contract Documents be submitted to Mediation.

15.4 Paragraph 15.4 and Subparagraphs 15.4.1, 15.4.1.1, 15.4.2, 15.4.3, 15.4.4, 15.4.4.1, 15.4.4.2 and 15.4.4.3 are hereby deleted in their entirety.

Arbitration and any other terms of the General Conditions requiring Arbitration are deleted in their entirety, and it is not required that any controversy or claim arising under any of the Contract Documents be submitted to Arbitration.
Department of Facilities and Operations

Owner’s
Special Conditions
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INTRODUCTION

The Owner’s Special Conditions have been developed by Northside Independent School District, Department of Facilities and Operations (Owner), to assist the Contractor with procedures during the construction and close-out of this project. Depending upon the specific type of project (addition, renovation, new school, mechanical work, roof replacement, etc.) certain sections or paragraphs may not be applicable. In general, this manual attempts to define an agenda and format for the Pre-Construction Conference and supplement many of the contractual requirements of the project specifications. No part of this Manual shall take precedence over or supplant the requirements set forth in the General Conditions and Supplementary General Conditions unless specifically stated.

Throughout the span of the project, the Owner solicits suggestions from any team member for ways to decrease time, improve quality or reduce costs. All suggestions may not be accepted. Acceptance of proposed changes shall be at the sole discretion of the Owner. The Owner is under no obligation to explain its reasons for its action.

A thorough review of this manual will provide important information on topics essential to the orderly management of the construction project. An understanding of the relationships of all team members and adherence to the procedures outlined is intended to improve the flow of information.
PRE-CONSTRUCTION CONFERENCE
Recommended Agenda

A. Introduction of all attendees
   • Distribute general information attachments

B. Discussion of Project Responsibilities
   • Team Concept - NISD, Architect/Engineer, Contractor
   • Owner’s Responsibility
   • Director of Facilities Construction
   • Architect/Engineer Responsibility
   • Construction Administration
   • Contractor Responsibility
     Protects Owner’s interest
     Coordinate all construction
     Manage all construction
   • School Personnel
     Principal
     Staff

C. Project Restrictions
Access to site
   • Office and Trailer Location
   • Construction Parking
   • Material Storage Area
   • Temporary Fencing
   • Top Soil Stockpile Area
   • Disposal of Soil
   • Not allowed to use school restrooms or cafeteria
   • Restrict workmen in existing school
   • Temporary Utilities
     Power
     Water
   • Security and Protection
     OFCI Storage Area
   • Harassment
   • Dress Code
   • Tobacco Use
   • Illegal Drugs and Alcohol

D. Permits, Licenses, Certificates, and Fees
   • General Contractor Bonds
   • Builder’s Risk Insurance
   • Liability and Worker’s Compensation Insurance
   • Licenses
   • Building Permits
Northside Independent School District
Owner’s Special Conditions

- Fees

E. Submittals
   - Review Procedure
     - Number and Type of Copies
     - Routing
     - Owner’s Copies
     - Submittal Log
   - Color Schedule
   - Substitutions
   - Samples

F. Project Meetings
   - Regular Bi-Weekly Meetings
   - Agenda
   - Minutes

G. Construction Phasing
   - New Schools
     - Early Completion
   - Temporary Partitions
   - Construction Phasing
     - Existing Equipment Storage and Relocation
     - Agency Inspections
     - School Occupancy
   - Utility Shutdown/Changeover

H. Inspections/Observations
   - A/E Observations
   - Contractor's Quality Control
   - Agency Inspections
   - Concealed Space Observation
   - Substantial Completion Inspection
     - Contractor
     - A/E
   - Future Maintenance
   - System Verification

I. Application and Certificate for Payment
   - Schedule of Values
   - Application for Payment
     - Match Schedule of Values
     - Review Procedure
   - Final Pay Application
     - Pre-Requisites
J. Schedules
   • Construction Schedule
     Monthly Revisions
   • Construction Delays
   • School Staff Support During Workdays

K. Construction Changes
   • Control of Construction Changes
   • Authority to Issue Changes
   • Proposed Change Order Procedure
   • Change Order

L. Record Documents
   • Contractor Responsible to Maintain
     Enforce with subcontractors
   • Pre-requisite for final payment

M. Maintenance Manuals
   • Contents of Manual
   • Arrangement of Information
   • Distribution

N. Project Clean-Up
   • Periodic and Final Clean-Up

O. Warranty Procedures
   • Expectations
   • Initiation of Requests
   • Acknowledgment of Repairs
   • Follow-up Letters
CHAPTER 1: PROJECT RESPONSIBILITIES

1.1 Team Concept

The Owner solicits the cooperation of the Architect, Engineer, Consultants and Contractor as team members to work under a Team Concept toward a successful project, but not limited to:

1.2 Owner’s Responsibility

The Owner’s responsibilities are defined in the General Conditions, Supplementary General Conditions and Contract. The Owner has assigned the following team members to the project with general duties as indicated.

DIRECTOR OF FACILITIES CONSTRUCTION / DIRECTOR OF ENGINEERING SERVICES

* Manages Owner’s Project staff
* Liaison with existing school personnel
* Liaison with other NISD team members
* Reviews and approves all payments
  * Reviews and approves all Allowance Expenditure Authorizations,
  Construction Change Directives and Change Orders
  * Assists in resolving disputes

OWNER’S PROJECT MANAGER

* Observes construction
* Liaison with existing school personnel
* Liaison with other NISD team members
* Reviews submittals
* Reviews and approves all payments
* Schedules and attends project meetings
* Attends substantial completion and final inspections.
  * Reviews and approves all Allowance Expenditure Authorizations,
  Construction Change Directives and Change Orders
* Works with Architect on document interpretations or clarifications
* Liaison with agency representatives
* Submits warranty requests through the Architect to the Contractor

OWNER’S CONSTRUCTION OBSERVERS

* Observes all phases of construction
* Approves mock-ups of various materials and systems
* Attends project meetings when necessary
* May review submittals
* Attends all above-ceiling, substantial completion and final inspections.
* Conducts Pre-Installation Meetings.
* Collects manpower counts when required.

1.3 **Architect's Responsibility**

The Architect's responsibilities are defined by the General Conditions, Supplementary General Conditions, Construction Contract, and its Contract with the Owner. General areas of responsibility include, but are not limited to:

* Interpretation and clarification of the Contract Documents
* Observation of construction
* Reporting of defective or deficient work
* Review of submittals
* Review of Contractor's applications for payment and request for extension of time
* Review and processing of Proposal Requests, Construction Change Directives, Allowance Expenditure Authorizations, and Change Orders
* Review of the work at Substantial Completion and Final Inspection.
* Warranty Period

The Architect is responsible for employing Consultants for appropriate phases of the work such as mechanical, plumbing, electrical, technology and others as may be necessary. As the single source design professional, the Architect is therefore responsible for his consultants providing the services provided by these Consultants.

1.4 **Contractor's Responsibility**

The Contractor's responsibilities are defined by the General Conditions, Supplementary General Conditions and Contract. This includes coordinating, scheduling and expediting the work for completion within the agreed upon schedule. General area of responsibility include, but are not limited to:

* Management and coordination of all subcontractors
* Responsibility for all acts of all construction workers
* Protecting the Owner's interests
* Protection of students, Owner's Staff, people and property
* Maintaining an orderly, clean and safe construction site
* Coordination of trades and testing laboratories
  * Notification or Architect and Owner upon discovery of any questionable, conditions, designs, materials, details, or procedures
* Coordination with school principal to ensure student and staff safety
* Keeping the Architect and Owner informed through reports and meetings
* Quality Control of all construction
* Compliance with all applicable codes and regulations
  * Scheduling timely concealed space observations by Architect, Owner and Governing Agencies
* Prompt correction of all warranty items
1.5 School Personnel

Many of the Owner's projects involve school personnel such as the principal. The Owner will designate appropriate school staff for contact/coordination purposes at the start of the project. Designated school staff is made available for coordination between the construction work and school activities during and after normal school hours. School staff shall not be contacted for interpretation of the Contract Documents, changes in the work, or other duties reserved for the Architect or other Owner personnel previously designated.

During addition or renovation projects, it is frequently necessary to shutdown utilities or services for connections or change-over. This must be coordinated through the Owner’s Project Manager and Architect 72 hours prior to the shutdown to allow the school district to make alternative preparations. This is defined as weekday hours only excluding designated holidays.

The Contractor is not authorized to make any changes in the work requested by school personnel unless directed by the Architect, or unless it is an emergency affecting the safety of students, school personnel, other persons or property.

Project visitation or tours shall be coordinated with the school principal and Owner’s Project Manager. Random tours by school personnel will not be allowed due to safety concerns. Tours shall be arranged in advance with the General Contractor and approved by the Owner and General Contractor. All visitors must check-in at the field office. All visitors must abide by all safety and insurance regulations at all times.

CHAPTER 2: PROJECT RESTRICTIONS

2.1 Access to Site

Routes for access to the site shall be restricted to those shown on the Contract Documents. If none are indicated, access routes shall be agreed upon during the Pre-Construction Conference. No change to this access route shall be allowed unless approved in writing by the Architect. Any damage to existing paving, curbs, walkways, landscaping, Irrigation, etc. shall be repaired or replaced by the Contractor at no cost to the Owner. The Contractor shall be required to maintain the access roads in a clean condition at all times and remove any temporary access provisions at completion of the work.

In projects involving additions and renovations to existing facilities, access shall be limited to locations agreed upon by the Owner, the school principal, the Architect, and the Contractor and/or as shown on the Drawings. The Contractor shall enforce access restrictions with all personnel. Deliveries may be restricted to hours convenient to the school to avoid conflicts.

2.2 Field Office and Trailers
Provide temporary field offices, weather tight, lockable, and of sufficient size to accommodate required office personnel at the project site, furnished and equipped as specified below. The room(s) shall be maintained in a clean and orderly condition.

- Light colored resilient floor, wall and ceiling finishes
- Operable windows with blinds and insect screens
- Air conditioning and heating to maintain indoor temperatures of 68° F and 74° F respectively.
- Adequate fluorescent lighting
- 110-120 volt duplex outlets as necessary
- Telephone service with fax and internet connectivity
- Office furniture as necessary for Contractor’s personnel
- Plan table(s) and bookshelves
- Meeting room with table and seating for 12 (minimum 250 sf)
- Tack boards as required and erasable marker board
- Wall calendar
- Drinking water cooler

  * The Field Office shall maintain/provide six (6) OSHA approved hardhats for NISD personnel. Hardhats shall be new and white in color and shall not have any logos.

The location of the trailer and other temporary buildings such as tool sheds, toilets, etc., shall be agreed upon by the Owner’s Project Manager, the school principal, the Architect, and the Contractor or as shown on the Drawings. The location shall be coordinated with future work so as not to interfere with utility work, paving, etc. and to avoid interference with existing school operations. The Contractor shall not locate trailers in existing parking area unless approved by the Owner.

2.3 Construction Parking

The Contractor shall allow parking by workers in areas designated in the Contract Documents. If not designated, a joint agreement shall be reached by the Owner, principal and Contractor. If space is not available, the Contractor shall require workers to park off-site.

2.4 Material Storage Areas

The Contractor shall restrict storage of materials to areas designated on the contract Documents. If not designated, a joint agreement shall be reached by the Owner, principal and Contractor. Storage containers shall be immediately repaired/replaced if vandalized or damaged during construction.

2.5 Temporary Fencing

The Contractor shall provide a temporary construction fence where shown by the Contract Documents. Temporary fencing shall be chain link, except as permitted otherwise by the Architect and Owner, minimum 6’—0” in height, with locking gates
for entry. Posts shall be minimum 1.5" diameter galvanized steel firmly embedded in concrete. Fencing shall be maintained straight and secure for the duration of operations requiring its presence.

2.6 **Restrooms**

The Contractor shall provide adequate temporary sanitary facilities for construction workers. These should be located to avoid odors and visibility by the students, staff and visitors. Workers will not be allowed to use restrooms within the existing school facilities. Facilities shall be secured to prevent vandalism.

2.7 **Use of School Cafeteria/Telephones**

Construction workers may not use the existing school cafeteria, vending machines, or telephones.

2.8 **Construction Traffic within Existing School**

The Contractor shall monitor on a full-time basis all construction personnel within existing buildings, especially when buildings are occupied by students or school staff.

2.9 **Identification Badges**

All construction workers, delivery persons and others associated with the Contractor’s work shall be required to be identified by a personnel badge. The Contractor shall provide badges and maintain an issuance log. The badge shall be worn at all times the person is present on an existing campus. The badge shall have a current photo, person’s name and the company under which the person is employed. Persons found at the site without their badges will be asked to leave the premises and will be reported to the Contractor’s Superintendent.

2.10 **Use of Existing Utilities**

In new construction the Contractor shall provide and pay the costs of temporary utilities for the duration of the project until such time as the project is fully accepted. Acceptance and turn-over of utility costs shall be the joint determination of the Architect, Contractor and Owner.

For renovation and addition work on existing campuses, in general the cost of utilities (with exception of telephone and internet service) shall be borne by the Owner unless designated otherwise in the Contract Documents. When using the Owner’s utilities the Contractor shall enforce energy and utility conservation whenever possible. If usage is determined to be excessive, in the sole determination of the Owner, the Contractor shall be required to reimburse the Owner for utility costs.

The Contractor shall be fully responsible to coordinate and verify existing utilities on site. Any damage occurring to existing utilities resulting from the work shall be the
Contractor’s responsibility to promptly repair at its cost. The Contractor shall immediately notify the Architect and Owner should any utility service be interrupted during the project.

2.11 Security

The Contractor shall provide security to protect the work, materials and site at various times. Temporary barriers, signage, lighting, etc., shall be provided as necessary. A full-time security person may be required for protection of the work against vandalism, theft and other malicious acts. The cost of security shall be borne by the Contractor unless otherwise stated.

2.12 Harassment

Harassment of students, staff and other NISD personnel will not be tolerated. The Contractor will be informed of any complaints and will immediately and permanently remedy the problem.

2.13 Dress Code

Workers shall be fully clothed at all times. Workers wearing shorts or without shirts will not be allowed on the project. Clothing shall not have indecent or suggestive logos or words. Advertisements for tobacco, alcohol, drugs or firearms are prohibited.

2.14 Tobacco

Smoking and chew less tobacco products are prohibited on the Owner’s properties at all times and shall be fully enforced by the Contractor. Tobacco products may not be brought onto the Owner’s property by any person at any time.

2.15 Illegal Drugs and Alcohol

No alcoholic beverages or illegal drugs shall be brought on the Owner’s property at any time. Workers found or believed to be under the influence of illegal drugs or alcohol shall be permanently removed from the project.

2.16 Firearms

Firearms shall not be brought onto the Owner’s property at any time. Anyone found to be in possession of a firearm(s) will be immediately referred to the local authorities and will be permanently expelled from the project.

2.17 Project Sign

The Contractor shall provide, erect and maintain a project sign as shown in the Contract Documents. The sign shall be immediately repaired/replaced in the event of any damage during construction. Coordinate the location of the project sign with the
Owner’s Project Manager and, if required, the Principal of existing campuses.

2.18 **Project Photographs**

The Contractor shall maintain a comprehensive file of project photographs from the start to completion of the project. The photographs shall include documentation of all trades and be chronologically ordered by date and trade to indicate the order and progression of the work. Particular attention shall be paid to concealed conditions. The files of photos shall be provided to the Architect and Owner for inspection on CD-ROM upon request at any stage of construction.

**CHAPTER 3: PERMITS, LICENSES, CERTIFICATES, AND FEES**

3.1 **Contractor Licenses**

The Contractor and all subcontractors involved in the project shall obtain and pay for all necessary business and contractor licenses as required by any law or the Authority Having Jurisdiction (AHJ).

3.2 **Building Permits**

The Owner shall pay for the building permit unless otherwise indicated by the Contract Documents. The Contractor shall obtain and pay for all other required trade permits and pay for all inspections required by any authority having jurisdiction over the project.

3.3 **Grading and Foundation Permits**

On projects that are developed on a fast-tract basis, the Owner shall obtain and pay for the necessary clearing, grading and/or foundation permit.

3.4 **State Highway Permits**

In certain instances, the connection of a school entry drive to a highway requires a State Highway Permit. Unless otherwise noted the Contractor shall pay for this permit.

3.5 **Utility Impact Fees**

The Owner shall pay the utility impact fees only to connect to existing utilities at the property line or in adjacent streets and right-of-way for the project. All other fees are the responsibility of the Contractor unless otherwise defined by the Contract Documents.
CHAPTER 4: SUBMITTALS

4.1 Submittals/Shop Drawings

The requirements for the submittal of shop drawings and submittal of material brochures are outlined in the project specifications. All subcontractor submittals shall be submitted to the Architect through the Contractor. The Architect shall review and take the appropriate action on submittals within Thirty (30) days after receipt.

All copies of submittals shall be reviewed and approved by the Contractor prior to submitting to the Architect. The Architect will retain three (3) copies of each submittal. The Contractor shall also retain two (2) copies of all approved submittals for Owner records. The complete set of all approved submittals (including an index) shall be transmitted through the Architect to the Owner at the completion of the project. The Contractor and Architect shall maintain a log of submittals so that the status of all shop drawings, etc., may be monitored through the construction phase. The log shall contain adequate information regarding the submittal, review dates, submittal descriptions, and action taken.

Within forty-five (45) days of award of contract the Contractor shall prepare and provide a reasonable schedule of submittal due dates to the Architect for review provided that a reasonable schedule is not established in the Contract Documents. The schedule is intended to establish an advance time line for when each submittal is required to avoid material delays. Lesser times shall be designated in the Contract Documents and be applicable for smaller scope projects.

4.2 Interior and Exterior Color Schedule

Color and material selections must be approved by the Owner’s Building Committee and may take up to five (5) weeks for approval. All items involving color or material selections shall be assembled and submitted to the Architect at one time.

4.3 Substitutions

See Specifications.

4.4 Mock-ups

The Contract Documents shall establish a list of mock-ups for various materials. Mock-ups are intended to establish a standard by which to gauge the work as it is constructed. It is intended that each mock-up shall be exact and of the highest quality workmanship. The mock-up shall be constructed and completed at least three (3) days in advance of the subject work proceeding. Approval of the mock-up by the Owner and Architect is required prior to work proceeding. Should the mock-up not be approved it shall be promptly removed and replaced at no cost to the Owner until such time as it meets the required standard.
4.5 **Masonry Samples (on applicable project only)**

As soon after the award of contract as practical, the Contractor shall obtain samples of applicable masonry units specific to the project and submit them to the Architect for review. The Architect and Owner will select samples and advise the Contractor to proceed with building sample panels, at least 6' wide x 8' high of each of the masonry samples selected. Approval of the selected sample will be provided through the Architect. The sample panel shall remain in good condition at the project site until substantial completion of the project.

**CHAPTER 5: PROJECT MEETINGS**

5.1 **Project Meetings**

Regular project meetings shall be scheduled by the Owner on a bi-weekly or as needed basis depending upon the size and complexity of the project. The meeting should be on the same time of day and day of week. The exact day, time and location of project meetings shall be agreed upon during the Pre-Construction Conference.

Representatives of these organizations should be in attendance at each meeting
* General Contractor’s Project Manager and Superintendent
* Mechanical/Plumbing Subcontractor
* Electrical Subcontractor
* Other Subcontractors as required
* Architect/Engineer
* Owner’s consultants
* Owner

Special meetings may be called when required with appropriate prior notice to all applicable parties by the Owner, Architect or Contractor.

The Architect shall chair all project meetings and be responsible for scheduling, preparing the necessary agenda and minutes, and ensuring that necessary topics are discussed.

The General Contractor shall be responsible for submitting a two-week Outlook Construction Schedule. In the Outlook Schedule the Contractor shall outline a forecast for the work that is planned for the upcoming weeks. He shall inform the Design Team of what work will be started and or completed. Additionally he shall state the current status of on-going work, new material (i.e. brick, joist, roofing, etc) or equipment (i.e. Chillers, RTU, Kitchen, etc) that is anticipated to arrive on the job site. The two-week outlook shall be submitted in writing at each bi-weekly project meeting.

5.2 **Project Meeting Agenda**

The Architect shall prepare an agenda for the meeting and distribute copies of the agenda to the Owner and Contractor at least twenty-four (24) hours prior to the
meeting. Topics for the agenda shall include, but not be limited to:

* Unfinished business from past project meetings
* Summary report on the status of the Overall Construction Schedule
* Review of the Outlook Construction Schedule
* Review of potential problems
* Review of the Submittal Log
  * Review of status of Requests for Information (RFI), Proposal Requests, and Changes
* Review of status of Requests for Information (RFI), Proposal Requests, and Changes
* Review of status of Requests for Information (RFI), Proposal Requests, and Changes
* Review of status of Requests for Information (RFI), Proposal Requests, and Changes
* Other business

5.3 Meeting Minutes

The Architect shall prepare formal minutes and forward a draft copy for review to the Owner, Consultants and Contractor within five (5) work days of the meeting requesting that any changes or corrections be returned to him within three (3) work days. The final formal minutes shall be issued within three (3) work days thereafter.

5.4 Pre-Installation Meetings

Pre-installation meetings shall be conducted for various trades. A list of the minimum required pre-installation conferences is included as an exhibit to this document. Other pre-installation conferences may be required and will be listed in other portions of the Contract Documents. Topics to be discussed in the pre-installation conference are found in the Contract Documents in each respective Section. In general, persons required to be in attendance at each pre-installation conference are as follows:

* General Contractor’s Project Manager and Superintendent
* Specific Trade Subcontractor
* Related Trade Subcontractors (as necessary)
* Manufacturer’s Representative (as necessary)
* Architect/Engineer
* Owner’s consultants (as necessary)
* Owner

CHAPTER 6: CONSTRUCTION PHASING

6.1 New Campuses and Additions/Renovation to Existing Campuses

The Contractor shall cooperate with the new school staff and Owner to turn over portions of the building as required to meet the Owner’s required schedule. Specifics regarding turn-over shall be discussed in various project meetings as completion of the project nears.

In addition or renovation projects, it may be necessary to divide the construction into phases so the school can continue to operate. Phasing of the project is defined in the Contract Documents. Detailed discussions regarding phasing, room relocation, utility changeover, utility shut-off, etc., shall occur during the Pre-Construction Conference.
6.2 **Temporary Partitions**

Temporary partitions are required to isolate areas under construction from operating portions of the school and, when necessary, are indicated on the Contract Documents. Temporary partitions shall be constructed as shown in the Contract Documents. Partitions shall be caulked or sealed to prevent dust on the construction side from passing through the school operation side. Temporary partitions shall be insulated to contain construction noise.

6.3 **Temporary Entrances**

Temporary entrances shall be erected where shown by the Contract Documents or located where required by the Contractor operations for safe passage of students and staff. Temporary entrances and coverings (if any) shall be structurally sound, engineered when required, comply with applicable building codes, allow for the safe operation of doors, adequate steps or ramps, have non-slip surfaces, and temporary signage.

The location and construction of temporary partitions and temporary exits shall be reviewed with the Architect and a representative of the agency having jurisdiction prior to construction.

6.4 **Temporary Fire Protection**

Minimum 20-lb. Type ABC fire extinguishers shall be located where required to meet the Contractor’s safety plan and provide adequate temporary fire protection. Workers shall be skilled in the operation of these extinguishers. Fire watches shall be established and maintained by industry standard and the Contract Documents when working with hazardous materials that may cause fire such as welding, open flame torches, etc. When working in an existing facility, special care should be taken to minimize the risk of fire.

The existing fire alarm and fire sprinkler systems shall remain operational wherever required in existing buildings.

6.5 **Existing Equipment Relocation**

The Contractor is responsible for investigating existing equipment to be relocated, determining the procedure, means, and method of removal and determining the appropriate rough-ins so the equipment can be relocated with minimal downtime. The time schedule for relocating the equipment shall be coordinated with the Architect.

6.6 **Authority Have Jurisdiction**

During any project, the governing authority having jurisdiction normally requires a final inspection prior to occupancy of completed areas. The Contractor shall schedule these inspections to allow prompt occupancy of completed areas. A Temporary
Certificate of Occupancy may be required and is the responsibility of the Contractor to obtain. Obtaining and maintaining the Temporary Certificate of Occupancy is the sole responsibility of the Contractor until such time as a permanent Certificate of Occupancy has been issued.

6.7 School Occupancy

Adequate time shall be allowed in the construction schedule for the school to relocate staff, furnishings and equipment to the completed phases or areas of the project. Timing shall take into consideration deployment of technology and preparation of floors by the Owner’s custodial staff. The Owner’s project manager shall provide this information. The current School Calendar will be provided to Contractor by Owner. Construction shall be coordinated with school operations, both during and after regular hours, during testing periods, etc.

6.8 Utility Shutdown/Change Over

Contractor shall issue a request to the Owner’s Project Manager and Architect for a utility shutdown a minimum of 72 weekday hours. Owner’s approval is required prior to any utility shut down.

All permits, testing and inspection required by both the local jurisdiction and the Owner shall be provided and coordinated with each shutdown. Where applicable the Owner’s Maintenance Department will require “green tag” approvals from utility shut down inspection before any equipment may be restarted after a shutdown.

The Contractor shall ensure that the necessary materials and equipment are available on-site before beginning the shutdown or change-over. Any after hours connections, if required, will be at no additional cost to the District. The Contractor shall be aware of school holiday schedules and attempt to schedule shutdowns/changes over these days when practical.

CHAPTER 7: INSPECTIONS/OBSERVATIONS

7.1 Architect/Engineer Responsibility

The Architect’s responsibilities during the Construction Phase, and those of his team, are defined in the General Conditions, Supplemental General Conditions, his contract with the Owner and the Contract. Following each site visit, the Architect and/or his consulting engineers, are required to report in writing their observations to the Contractor and Owner.

7.2 Contractor’s Responsibility

The Contractor’s responsibilities are defined in the General Conditions, Supplemental General Conditions, the Contract and the various Specification Sections.
7.3 Concealed Space Observation

Prior to the installation of any wall or ceiling material the Contractor shall notify the Architect and Owner’s Project Manager so that arrangements can be made for a review of the area proposed to be closed. The Contractor shall give as much advance notice as possible, but no less than 72 weekday hours. Preferably this task shall be scheduled on the Contractor’s two week look ahead schedule.

7.4 Special Inspections

Special Inspections are required by the Building Code and Authority Having Jurisdiction (AHJ). Evidence of the successful completion of the Special Inspections, which are defined in the Contract Documents, must be provided by the Contractor prior to Substantial Completion.

The Contractor shall provide and maintain at the job trailer a log for sign-in by the Testing Laboratory. The Contractor’s Superintendent shall monitor the log and ensure that the Testing Laboratory representative logs-in and out for each required task. The log shall also include dates and the log-in and log-out times for each inspection. The Project Superintendent shall also maintain on-site all Special Inspection reports from the Testing Laboratory.

7.5 Substantial Completion Inspection

Prior to requesting the substantial completion inspection by the Architect/Engineer, the Contractor shall conduct his own inspection of the construction and provide the Architect with a list of deficiencies (punch list). He should identify areas of unacceptable quality and construction that may be incomplete. He should then work to ensure that these areas are corrected and construction is completed prior to notifying the Architect/Engineer that the project is ready for a substantial completion inspection.

The following people should be in attendance for the substantial completion inspection:

* General Contractor
* Mechanical Subcontractor
* Electrical Subcontractor
* Other Subcontractors as required
* Architect
* Consulting Engineers
* Owner’s Project Manager
* Owner’s Construction Observers
* Owner’s Maintenance Personnel

The punch list generated by the substantial completion inspection tour will be prepared by the Architect and distributed to the Contractor and Owner.

It is essential that correction of all punch list items be completed within thirty (30)
calendar days after its formation. After correction is complete, the Contractor should notify the Architect who will perform a follow-up review and sign off and date each item on the punch list to assure completion of each item on the punch list. Upon satisfactory completion of the deficiencies, the Architect will submit to NISD through the Contractor a signed off punch list and AIA Document G704 Certificate of Substantial Completion.

7.6 Future Maintenance

Adequate clearance around equipment, valves, VAV boxes, electric panels, controls, etc. must be taken into consideration as each item is installed. It is the Contractor's responsibility to coordinate other trades that may be involved with installation of equipment in the same area as an item that has been previously installed. Any equipment installed without the proper access or which restricts access to other equipment will be required to be removed or relocated and reinstalled to provide ample maintenance accessibility at no cost to the Owner.

7.7 Systems Verification

Near the completion of the project, the Owner will conduct an all systems verification for the purpose of confirming that the mechanical and electrical systems, fire alarm, intercom, security, public address, energy management controls, etc. are operating adequately. Systems verification will occur only after the test and balance report has been completed.

CHAPTER 8: SCHEDULE OF VALUES AND APPLICATIONS AND CERTIFICATE FOR PAYMENT

8.1 Schedule of Values

The Contractor shall submit a completed AIA Document G703 Schedule of Values to the Architect prior to the first Application and Certificate for Payment. A construction schedule for the entire project shall also be provided. Multiple site projects shall have a separate AIA Document G703 prepared for each site. See General Conditions Article 9.2.1.

8.2 Application for Payment

The Contractor's monthly Application and Certificate for Payment shall be submitted on AIA Document G702 (see exhibit C). The various categories for the cost included in the Application and Certificate for Payment shall parallel the Schedule of Values previously submitted to the Architect and approved by the Owner. An updated copy of the Schedule of Values, AIA Document G703 shall be re-submitted with each application for payment. The Contractor shall submit a minimum of three (3) copies of the completed Application and Certificate for Payment, Schedule of Values and supporting documents to the Architect for review.
The following process shall be followed for submission of each application:

* The Contractor shall submit a rough draft of the application for payment to the Architect a minimum of five (5) working days prior to the date of the project meeting when the formal application is set for review.

* The Architect shall promptly review the draft application and advise the Contractor at least 24-hours in advance of the formal meeting of any required changes.

* At the formal review meeting the Architect, Owner and Contractor shall review the formal application along with the required updated schedule, affidavit of bills paid and release of lien. If all is found to be in order the Architect shall sign the original and each copy of the application and hand them to the Owner’s Project Manager who will deliver them to the Facilities and Operation Office in-house accounting personnel for processing.

* Should any part of the submission found to contain error the application will be returned to the Contractor. It shall be the Contractor’s responsibility to hand deliver the corrected documents to the Architect and Owner in a timely manner to meet the Owner’s payment deadlines.

Provided that an Application for Payment is reviewed under the above scenario no later than the last Wednesday of the month, the Owner shall make payment to the Contractor not later than the second Friday of the following month. If an Application for Payment is received after the application date fixed above, payment shall be made by the Owner not later than the fourth Friday of the following month after receipt of the application. See Article 9.3.1.3 of the Supplementary General Conditions.

The Owner will only allow payment for materials stored at the project site or other Owner-owned site. Materials shall be properly stored and available for inspection by the Architect and Owner at all times.

8.3 Final Application for Payment

The final application for payment may not be submitted until the project has been approved by the Architect, the Owner, and applicable governing agencies. Additionally, the final application for payment will not be reviewed until all prerequisites for project close-out have been satisfactorily completed and delivered to the Architect, including record drawings, lien releases, maintenance manuals, warranties, equipment instruction, etc.

CHAPTER 9: SCHEDULES

9.1 Construction Schedules

A bar chart type “critical path method” schedule is required for all projects. The information shall be provided in a detailed format by trade, task and time frame. Each task shall be divided into defined units of work that can be measured against the
schedule. The overall project must be separated into portions or phases that can be easily monitored. The Contractor shall continuously monitor and frequently (monthly) update the schedule.

At the end of each month, the Contractor shall revise and update the master construction schedule adjusting the tasks and dates as necessary to reflect the actual condition of the project. The Contractor shall submit a revised copy of the construction schedule with each monthly application for payment.

9.2 Construction Delays

The Contractor shall notify the Architect and Owner of any claim for extension of time in writing on or before the due date of the Contractor's application for payment concerning the period in which the delay began per Article 8.3.1 of the Supplementary General Conditions.

The Owner reserves the right to substitute unused monthly weather delay days for time extension days claimed for any reason by the Contractor, whether those be for delay of any kind or for change orders to the work.

The Owner, at its sole discretion, may elect to log delay days and hold such days for adjustment at the end of the contract. Time extensions for weather delays will not be granted until completion of the project, but will be logged monthly and adjusted at the end of the project, if needed.

9.3 School Staff Support During Workdays

Work involving existing occupied buildings requires an Owner's staff member be present during construction activities. Generally, the school custodial staff will open and close occupied facilities where construction is in progress. Facilities will be open and available during normal workdays. Extra workdays, such as, weekends and holidays, will require special arrangements with the school staff via the Owner’s Project Manager. Minimum 72 weekday hour request is required in order to make adjustments in custodial hours. Short notice requests which results in overtime costs may be charged to the Contractor. A minimum of two hours time will be charged for any period in which a custodian is required.

CHAPTER 10: CONSTRUCTION CHANGES

10.1 Control of Construction Changes

The Architect will maintain a log of Proposal Requests (PR’s), Allowance Expenditure Authorizations, Construction Change Directives, and Change Orders indicating the status at any time of those various documents. Only after a PR has been approved by the Owner can the change be included in an Allowance Expenditure Authorizations, Construction Change Directive or Change Order (AIA Document G701). The Architect is responsible for assigning Change Order numbers, issuing Change Orders and
keeping current logs of approved changes.

10.2 Authority to Issue Changes

The authority to order a change to a project under construction, however, rests solely with NISD. Changes in the monetary sum of the contract for sums less than $50,000 may be made by the Owner’s staff with approval of the Assistant Superintendent of Facilities and Operations. Changes in the monetary sum of the contract for sums exceeding $50,000 require action by the Northside ISD Board of Trustees in a scheduled Board of Trustees Meeting.

10.3 Proposed Change Order Procedure

Issuing the PR  The Architect issues the Proposal Request (PR) to the Contractor requesting pricing for certain defined work. When practical a PR is to be issued within ten (10) working days of the date that the Architect finds cause for issuing the PR. The PR shall contain specific information, drawings and/or specifications related to the specific work to be priced.

Contractor’s Response  Within ten (10) working days the Contractor shall provide to the Architect a detailed labor and material breakdown of the proposed pricing for the PR. Labor shall be broken down by man hours and include hourly rates and labor burden. Materials shall include all quantities, units and unit prices. Overhead and profit shall be separated for subcontractors. Overhead and profit shall be affixed for the Contractor only when the PR will be taken from funds other than the Contingency Allowance.

Architect’s Review  The Architect shall review the Contractor’s response within ten (10) working days and either request further information or forward it with a recommendation to the Owner’s Project Manager. If the PR is returned to the Contractor a subsequent response shall be provided back to the Architect in no more than ten (10) working days.

Owner’s Review  The Owner reserves the right to return a PR for further review. In the event that a PR is returned by the Owner the Contractor shall respond with the requested information within ten (10) working days. If the PR is found to be acceptable, and if the sum is less than $50,000, the Owner will direct the Architect to issue a Contingency Change Order, Construction Change Directive or Change Order. If the sum exceeds $50,000 the PR will be forwarded for Board of Trustees action.

10.4 Change Orders

Contingency Change Orders  Contingency change orders are drawn against a fund established within the Contract. Upon completion of the project any remaining funds will be credited by Change Order to the Owner. Upon approval of an Allowance Expenditure Authorization, by the Owner, the Architect shall issue same with his signature, the Contractor shall sign it, and it will be finally executed by the Owner and
take effect. At that time the Contractor is authorized to proceed with the work.

**Construction Change Directive** A construction change directive (CCD) is issued to expedite the work in a case when time is of the essence. These documents are often issued with a “price not-to-exceed” meaning that negotiations to a final price will continue once the work is authorized. The Contractor is bound by the Contract to proceed with the work when a CCD is issued regardless of whether a final price has been agreed upon. A formal Allowance Expenditure Authorization or Change Order will follow once a final price has been determined. Upon approval of issuance of a Construction Change Directive by the Owner, the Architect shall issue same with his signature, the Contractor shall sign it, and it will be finally executed by the Owner and take effect. At that time the Contractor is authorized to proceed with the work.

**Change Order** A change order is drawn against funds that are not presently within the Contract. The General Contractor is allowed to add overhead and profit to change orders. Upon approval of a Change Order by the Owner, the Architect shall issue same with his signature, the Contractor shall sign it, and it will be finally executed by the Owner and take effect. At that time the Contractor is authorized to proceed with the work.

**Board of Trustees Approval** Depending on timing approval of a +$50,000 PR by the Board of Trustees may take up to one month or more. For PR’s of this type it is generally necessary to have all pricing settled no later than the first Monday of each month. Each PR must be reviewed by the Board of Trustees “Building Committee” prior to being submitted for final Board of Trustees action.

**CHAPTER 11: RECORD DOCUMENTS**

11.1 **Record Documents**

The Contractor and its Subcontractors shall maintain an accurate, current set of record documents as construction progresses. These record documents shall be maintained on-site in the Contractor's or Subcontractors' office area(s). All deviations from the contract set of drawings shall be noted in red for clear identification. The Architect, Engineers and Owner may periodically review the record documents.

11.2 **Final Close-out of Project**

Within 30 days after substantial completion of the total project, the complete record documents shall be compiled by the Contractor and submitted to the Architect.

11.3 **Closing Documents**

The Contractor shall use a spread sheet format for submission of required close-out documents. The General Contractor shall list each subcontractor alphabetically on EXHIBIT H and will check to insure a "Release of Lien", AIA Documents G706A is included for each. Additionally, he will check that a "Payment of Debts", AIA Document
G706 is also included for each subcontractor. Each subcontractor shall fill out the form at exhibit I indicating any supplies used and their Release of Lien AIA Document G706A. Warranties shall be included for any equipment furnished. All items shall be combined in the same tab for the subcontractor.

**CHAPTER 12: MAINTENANCE MANUALS**

12.1 Contents of Maintenance Manuals

The Contractor shall prepare maintenance and operating manuals for certain pieces of equipment and systems. The Maintenance Manuals shall contain information relative to the operation and maintenance of the equipment, wiring diagrams and replacement parts lists.

12.2 Arrangement of Information

Maintenance Manuals shall be bound in sturdy three-ring binders with an index on the outside explaining the contents. Each separate piece of equipment shall be separated by tabs identifying that piece of equipment. Immediately behind each tab shall be a typed list of equipment including manufacture, model number, serial number, quantity and location (plan room number of each). Provide copies of shop drawings where applicable.

12.3 Distribution of Maintenance Manuals

The Contractor shall prepare three (3) copies of maintenance information on the specified equipment. Two (2) copies of this information shall be delivered to the Owner within seven (7) days following completion of installation of that particular piece of equipment if the Owner is to operate that equipment prior to final completion of the project. The remaining copy of the maintenance manuals shall be delivered to the Architect within thirty (30) days following substantial completion of the project along with all other close-out documents.

**CHAPTER 13: PROJECT CLEAN-UP**

13.1 Contractor's Responsibility

Continual clean-up of the project and the site is the responsibility of the Contractor. On addition or renovation projects, it is extremely important that the construction area be kept as clean as possible. A complete site and building clean-up shall be accomplished each Friday leaving the site and building clean and orderly over the weekend.

13.2 Final Clean-up
The Contract Documents specify the Contractor's clean-up responsibility. At a minimum the following shall be provided:

* Mop all ceramic, quarry and vinyl tile floors (The Contractor shall not wax vinyl floor tiles.)
* Vacuum and clean all carpet
* Clean all windows, interior and exterior finishes
* Clean all light fixtures, plumbing fixtures and interior equipment
* Remove all non-permanent labels (except fire labels)
* Wash and clean all paved and sidewalk areas
* Clean all landscaped areas

CHAPTER 14: WARRANTY PROCEDURES

14.1 Response to Request

The Architect upon receipt of a warranty item shall forward it immediately to the Contractor. Upon receipt of the warranty item, the Contractor shall initiate the repair. Prior to commencing any repairs the Contractor shall contact the person who submitted the form prior to visiting the school. Upon arrival at the school, or Owner's building, each worker shall check in and sign-in at the office or reception desk in the Administration Office. All workers shall be identified by their photo i.d.

14.2 Repairs and Acknowledgment of Repairs

Coordination should be made with the Owner's personnel prior to commencing repairs. In any event, Owner-designated personnel must be present to acknowledge completion of the repair and must sign off on the copy and date it. A copy shall be sent back through the Contractor/Architect and then to the Director of Facilities Construction. The return of the signed copy constitutes completion of the request and all file copies can be so annotated.

See 6.8 Utility Shutdown/Change Over for utility interruptions required for repairs.

14.3 Follow-up Letters

The Facilities Construction Department will maintain a log of all warranty items mailed through the Architect to the Contractor. After 10 working days from initiation of the request, if the signed copy has not been returned, follow-up letters will be sent to the Architect for their action. Warranty items which take longer than 20 calendar days to complete will be considered severely deficient and meetings may be required to ascertain the failure of the Contractor to respond. It is expected that Architects will establish their own logs and follow-up procedures to avoid meetings of this nature.
**Project Name**

NISD Pre-Installation or Pre-Construction Meetings
All the meetings shall be coordinated with NISD Facilities Construction.

<table>
<thead>
<tr>
<th>Division</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division 2 – Site Work</strong></td>
<td>Site Work/Drainage/Utilities&lt;br&gt;Drilled Piers&lt;br&gt;Irrigation&lt;br&gt;Landscaping&lt;br&gt;Modular Block Retaining Wall&lt;br&gt;Playground</td>
</tr>
<tr>
<td><strong>Division 3 – Concrete</strong></td>
<td>Concrete (place – finish)&lt;br&gt;Stucco/Plaster</td>
</tr>
<tr>
<td><strong>Division 4 – Masonry</strong></td>
<td>Unit Masonry Assemblies: 2 week minimum prior to starting work in this section. (before lock work starts) *Note: this meeting to be combined with Dampproofing and Storefront, Windows and Glazing.</td>
</tr>
<tr>
<td><strong>Division 5 – Metals and Division 6 - Carpentry</strong></td>
<td>Structural Steel General Contractor, Architect, NISD Inspector, Structural Engineer Erector Sub Contractor, and Testing Lab.&lt;br&gt;Finish Carpentry and Millwork.</td>
</tr>
</tbody>
</table>
| **Division 7 – Thermal and Moisture Protection** | Dampproofing: 2 weeks minimum prior to starting work in this section. *Note: this meeting to be combined with Unit Masonry Assemblies and Storefront, Windows and Glazing.  
Waterproofing  
Roofing – (Metal, Torch Applied Modified Bitumen Roof System, etc): 2 weeks min prior to deck installation. GC, Roofing subcontractor, Mechanical Electrical and Plumbing subcontractor, Roofing Materials supplier, roofing consultants, Architect, NISD Roofing Inspector, and NISD Executive Director of Construction and Engineering.  
Sprayed on the Fire Proofing: 1 week min. prior to starting work in this section.  
Exterior Finish Insulation System EIFS: 1 week minimum prior to starting work in this section.  
Gypsum Drywall (Includes all stud framing for GWB or sheathing) |
| **Division 8 – Doors and Windows** | Storefront, Windows and Glazing: 2 week min prior to starting work in this section. *Note: This meeting to be combined with Unit Masonry Assemblies and Dampproofing. |
| **Division 9 – Finishes** | Tile – Quarry, Ceramic, and VCT: 1 week minimum prior to starting work in this section.  
Painting |
| **Division 22-23 – Mechanical & Division 26 - Electrical** | HVAC/Plumbing/Electrical/Firesprinkler  
Controls – Controls and HVAC sub at this meeting. |
| **Division 27 – Telecommunication** | Telecomm and Cabling  
Security |
Weather Data Sheet for San Antonio, Texas  
(Rain related)

<table>
<thead>
<tr>
<th>Month</th>
<th>30 Year Average Rainfall</th>
<th>Average Rain Days*</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1.71</td>
<td>8</td>
</tr>
<tr>
<td>February</td>
<td>1.81</td>
<td>8</td>
</tr>
<tr>
<td>March</td>
<td>1.52</td>
<td>9</td>
</tr>
<tr>
<td>April</td>
<td>2.59</td>
<td>6</td>
</tr>
<tr>
<td>May</td>
<td>4.22</td>
<td>7</td>
</tr>
<tr>
<td>June</td>
<td>3.71</td>
<td>8</td>
</tr>
<tr>
<td>July</td>
<td>2.16</td>
<td>7</td>
</tr>
<tr>
<td>August</td>
<td>2.54</td>
<td>6</td>
</tr>
<tr>
<td>September</td>
<td>3.41</td>
<td>8</td>
</tr>
<tr>
<td>October</td>
<td>3.17</td>
<td>9</td>
</tr>
<tr>
<td>November</td>
<td>2.62</td>
<td>8</td>
</tr>
<tr>
<td>December</td>
<td>1.51</td>
<td>7</td>
</tr>
<tr>
<td>TOTALS</td>
<td>30.97</td>
<td>91</td>
</tr>
</tbody>
</table>

*Rain days expressed here to the nearest whole day.

Data gathered from NOAA web site:
http://www.srh.noaa.gov/FTPROOT/EWZIhtml/cli/satnorm.htm

A rain day, for the purposes of this contract, shall be defined as any day where work on the project is substantially affected by the weather or muddy conditions so as to materially affect the critical path of the project. A minimum of 0.20 inches of rain must be measured and documented at the site by an Owner-recognized gauging device provided by the Contractor. Extensions of time for weather-related delay shall be exclusively defined by terms outlined in the Supplementary General Conditions and Owner’s Special Conditions.
## Application and Certificate for Payment

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Original Contract Sum</td>
<td>$100,000</td>
</tr>
<tr>
<td>2.</td>
<td>Net Change by Change Orders</td>
<td>$5,000</td>
</tr>
<tr>
<td>3.</td>
<td>Contract Sum to Date</td>
<td>$105,000</td>
</tr>
<tr>
<td>4.</td>
<td>Total Completed &amp; Stored to Date</td>
<td>$105,000</td>
</tr>
<tr>
<td>5a.</td>
<td>Retainage as % of Completed Work</td>
<td>$5,000</td>
</tr>
<tr>
<td>5b.</td>
<td>Retainage as % of Stored Material</td>
<td>$2,000</td>
</tr>
<tr>
<td>6.</td>
<td>Total Earned Less Retainage</td>
<td>$98,000</td>
</tr>
<tr>
<td>7.</td>
<td>Less Previous Certificates for Payment</td>
<td>$10,000</td>
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<tr>
<td>8.</td>
<td>Current Payment Due</td>
<td>$88,000</td>
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<tr>
<td>9.</td>
<td>Balance to Finish, including Retainage Amount Certified</td>
<td>$5,000</td>
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</table>

### Change Order Summary

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Change Orders Approved in Previous Months by Contractor</td>
<td>$10,000</td>
</tr>
<tr>
<td>2.</td>
<td>Change Orders Approved This Month</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

### Architect's Certificate for Payment

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, the amount certified is due and payable to the Contractor.
<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION OF WORK</th>
<th>SCHEDULED</th>
<th>WORK COMPLETED AND STORED TO DATE</th>
<th>BALANCE TO FINISH</th>
<th>RETAINAGE FINAL</th>
<th>THIS PERIOD</th>
<th>APPLICATION VALUE</th>
<th>100% OF TOTAL APPLICATION</th>
<th>RETAINAGE FROM PREVIOUS APPLICATION</th>
<th>RETAINAGE FROM CURRENT APPLICATION</th>
<th>APPLICATION NO.</th>
<th>EXHIBIT &quot;B&quot;</th>
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</tbody>
</table>

**APPLICATION NO:**

**DATE:**

**PERIOD TO:**

**ARCHITECTS PROJECT NO.:**

**APPLICATION:**

**DESCRIPTION OF WORK:**

**NOTE:**

**TOTAL COMPLETED AND STORED TO DATE:**

**RETAINAGE:**

**BALANCE TO FINISH:**

**TOTAL SCHEDULED:**

**WORK COMPLETED AND STORED TO DATE:**

**PERIOD:**

**APPLICATION VALUE:**

**100% OF TOTAL APPLICATION:**

**RETAINAGE FROM PREVIOUS APPLICATION:**

**RETAINAGE FROM CURRENT APPLICATION:**

**APPLICATION NO.:**

**EXHIBIT "B":**
Change Order

THE CONTRACT IS CHANGED AS FOLLOWS:
(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

The original Contract Sum was $0.00.
The net change by previously authorized Change Orders is $0.00.
The Contract Sum prior to this Change Order was $0.00.
The Contract Sum will be increased by this Change Order in the amount of $0.00.
The new Contract Sum including this Change Order will be $0.00.

The Contract Time will be increased by Zero (0) days.
The date of Substantial Completion as of the date of this Change Order is __________.

NOTE: This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.
# Certificate of Substantial Completion

**PROJECT:** (name and address)  
**CONTRACT INFORMATION:**  
*Contract For:*  
*Date:*  
**CERTIFICATE INFORMATION:**  
*Certificate Number:*  
*Date:*  

**OWNER:** (name and address)  
**ARCHITECT:** (name and address)  
**CONTRACTOR:** (name and address)  

The Work identified below has been reviewed and found, to the Architect’s best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.

(Identify the Work, or portion thereof, that is substantially complete.)

**ARCHITECT**  
(Firm Name)  
**SIGNATURE**  
PRINTED NAME AND TITLE  
DATE OF SUBSTANTIAL COMPLETION

**WARRANTIES**  
The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

**WORK TO BE COMPLETED OR CORRECTED**  
A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:

(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within (     ) days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected:  

$  

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:

(Note: Owner’s and Contractor’s legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

**CONTRACTOR**  
(Firm Name)  
**SIGNATURE**  
PRINTED NAME AND TITLE  
DATE

**OWNER**  
(Firm Name)  
**SIGNATURE**  
PRINTED NAME AND TITLE  
DATE

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ACORD CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFER NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE

<table>
<thead>
<tr>
<th>INSURER A</th>
<th>INSURER B</th>
<th>INSURER C</th>
<th>INSURER D</th>
<th>INSURER E</th>
</tr>
</thead>
</table>

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

<table>
<thead>
<tr>
<th>INSR LTR</th>
<th>TYPE OF INSURANCE</th>
<th>POLICY NUMBER</th>
<th>POLICY EFFECTIVE DATE (MM/DD/YY)</th>
<th>POLICY EXPIRATION DATE (MM/DD/YY)</th>
<th>LIMITS</th>
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<td>GENERAL LIABILITY</td>
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<td>CLAIMS MADE [ ] OCCUR [ ]</td>
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<td>ALL OWNED AUTOS</td>
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DESCRIPTION OF OPERATIONS, LOCATIONS, VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

CERTIFICATE HOLDER | ADDITIONAL INSURED, INSURER LETTER: | CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDOW TO MAIL _______ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

DO NOT COPY
IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.
The below item was identified by NISD personnel during the project warranty period.

PROBLEM DESCRIPTION

SUBMITTED BY: (Please Print)  WARRANTY TECHNICIAN SIGNATURE: PETE UHL
NAME: SHOP:

REMARKS / CORRECTIVE ACTION

NISD FACILITIES CONSTRUCTION USE ONLY

TO: MAINTENANCE DEPARTMENT WARRANTY TECHNICIAN

ACKNOWLEDGEMENT: TO BE SIGNED UPON COMPLETION OF WORK

PRINTED NAME: ___________________________ SIGNATURE: ___________________________ DATE: ___________________________

NISD CONSTRUCTION INSPECTOR

TO BE SIGNED UPON DETERMINATION THAT IN THE BEST INTEREST OF THE DISTRICT, MAINTENANCE IS TO COMPLETE ABOVE ITEM(s). SEE REMARKS, IF ANY.

REQUEST FOR NISD MAINTENANCE SUPPORT:

SIGNATURE: ___________________________ DATE: ___________________________

NISD DIRECTOR OF FACILITIES CONSTRUCTION
OR NISD DISTRICT ENGINEER

MAINTENANCE SUPPORT APPROVAL:

SIGNATURE: ___________________________ DATE: ___________________________

ASSISTANT SUPERINTENDENT of FACILITIES & OPERATIONS

SIGNATURE: ___________________________ DATE: ___________________________

DIRECTOR MAINTENANCE & OPERATIONS
### Northside ISD Facilities and Operations Project Closeout Checklist

PM: / GC: RFCSP#  

**PROJECT NAME:**

<table>
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<tr>
<th>CONTRACT CLOSEOUT DELIVERABLES*</th>
<th>RESPONSIBLE PARTY</th>
<th>COMPLETION DATE</th>
<th>COMMENTS</th>
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<td><strong>FINANCIAL / AIA DOCUMENTS:</strong> Original Not A Copy</td>
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<td>G702 - Application and Certificate for Payment. Submit FINAL Application for Payment.</td>
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<td>G706 - Contractor's Affidavit of Payment of Debts and Claims</td>
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<td>G706A - Contractor's Affidavit of Release of Liens</td>
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<td>G707 - Consent of Surety to Final Payment with Power of Attorney</td>
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<td>Final Change Order Log (Log must show all allowances with zero balance)</td>
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<td>Controls Plans &amp; Fire Sprinkler Plans ***</td>
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<td>Record Copy of Software w/Fire Alarm Panel Password***</td>
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<td><strong>OTHER HARD COPY DOCUMENTS</strong></td>
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<td>Testing &amp; Balancing Report, including Water &amp; Air reports</td>
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<td>Set of approved submittals with A/E comments (including all shop drawings)</td>
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<td>Maintenance &amp; Operation manuals on all equipment (Division 2-17)</td>
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<td>Specifications w/ all addendums &amp; change orders (MS Word) on CD-ROM &amp; Project Manuals</td>
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<td>Completed Punch List verified by A/E and letter</td>
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<td>Fire Alarm Installation Certificate (FML-009A) - (1) copy to NISD Maint. &amp; (1) posted at the Fire Alarm Control Panel ***</td>
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<td>Fire Alarm Certification / Completion Record *** (4) pg document from NFPA 72, fig. 4.5.2.1</td>
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<td>Asbestos free affidavit by Contractor on form ***</td>
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<td>Asbestos free affidavit by Architect on letterhead</td>
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<td>Short Term Worker / Contractor Asbestos Notification of form ***</td>
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<td>Warranties from General Contractor; SubContractor and Suppliers provide duplicated notarized copies (including 2 year roof warranties, Siemens and Cabling Warranty)</td>
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<td>G704 - Certificate of Substantial Completion</td>
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<td>TEA: &quot;Certification of Project Compliance&quot; from A/E</td>
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<td>TDLR &quot;Closed with Compliance&quot; letter, Plan review &amp; inspection worksheets</td>
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<td>Original &quot;Certificate of Occupancy&quot; and/or &quot;Letter from City&quot;</td>
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<td>Overstock Keys</td>
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* Final payment cannot be issued to the contractor until all documents have been received by the Owner and verified by the Architect. Confirm with Owner software compatibility.  
** Partial retainage may be held until A/E Team has received record drawings.  
*** These documents are generated by the Contractor and are to be delivered to the Architect.

---

NISD Project Manager  
Date  

Director of Facilities Construction  
Date  

Asst. Director of Engineering Services  
Date  

Executive Director of Construction & Engineering  
Date  

Asst. Supt for Facilities & Operations  
Date

Updated: 11/13/18
### Exhibit "H"

Closing Documents Required of General Contractor

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<th>Warrantees</th>
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Exhibit "I"
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<td></td>
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<tr>
<td>6TH ADD/RENOV</td>
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<table>
<thead>
<tr>
<th>OTHER USEFUL DATA:</th>
<th>FACILITY CODE: 511</th>
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<tr>
<td>PARKING SPACES AVAILABLE:</td>
<td>REGULAR</td>
</tr>
<tr>
<td>TOTAL ACREAGE OF SITE:</td>
<td>PLATTED</td>
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<tr>
<td>ASPHALT SQ.FT. AREA:</td>
<td></td>
</tr>
<tr>
<td>LEGAL DESCR.:</td>
<td></td>
</tr>
</tbody>
</table>
PART 1 - SUMMARY

A. Documents Include:

PART 2 - SUBSURFACE INVESTIGATION REPORT

A. Copy of the original geotechnical report is appended to the end of this document as Exhibit - A and is titled as follows:

   Geotechnical Engineering Study
   New Building Addition & Canopy Upgrades
   at Adams Hill Elementary School
   San Antonio, Texas
   Arias Job No. 2019-1083
   As prepared by: Arias GeoProfessionals
   February 6, 2020

B. This report identifies properties of below grade conditions and offers recommendations for design of foundations, prepared primarily for use of Architect/Engineer in the construction of the building addition and adjacent pavement.

C. Recommendations described are not requirements of this Contract, unless specifically referenced in Contract Documents.

D. This report, by its nature, cannot reveal all conditions existing on the site. Should subsurface conditions be found to vary substantially from this report, changes in design and construction of foundations will be made, with resulting credits or expenditures to Contract Price/Sum.

(REPORT TO FOLLOW)
Geotechnical Engineering Study

New Building Addition & Canopy Upgrades at Adams Hill Elementary School
San Antonio, Texas

Arias Job No. 2019-1083

Prepared For
Northside Independent School District
February 6, 2020
February 6, 2020  
Arias Job No. 2019-1083

Mr. Leroy San Miguel  
Northside Independent School District  
NISD Central Office Building E  
5900 Evers Road  
San Antonio, Texas 78238-1506

RE: Geotechnical Engineering Study  
Canopy Upgrades at Adams Hill Elementary School  
San Antonio, Texas

Dear Mr. San Miguel:

This report presents the results of a Geotechnical Engineering Study for the proposed new Building Addition and Canopy Upgrades at Adams Hill Elementary School in San Antonio, Texas. This study was authorized on January 31, 2020 by the signing of Arias Proposal No. 2019-1093, dated December 6, 2019.

The purpose of this geotechnical engineering study was to establish foundation and pavement engineering properties of the subsurface soil and groundwater conditions present at the site. The scope of the study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation and pavement design. Our findings and recommendations should be incorporated into the design and construction documents for the proposed development.

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. The quality of construction can be evaluated by implementing Quality Assurance (QA) testing. As the Geotechnical Engineer of Record (GER), we recommend that the earthwork and foundation construction be tested and observed by Arias in accordance with the report recommendations. A summary of our qualifications to provide QA testing is discussed in the “Quality Assurance Testing” section of this report. Furthermore, a message to the Owner with regard to QA testing is provided in the GBA publication included in Appendix E.

Thank you for the opportunity to be of service to you.

Sincerely,

Arias & Associates, Inc.  
TBPE Registration No: F-32

Kacy M. Crawford, P.E.  
Geotechnical Engineer

Jerry D. Shepherd, P.E., D.GE  
Senior Geotechnical Engineer

Austin • Corpus Christi • Eagle Pass • Fort Worth • San Antonio
REPORT FORMAT INFORMATION

To improve clarity in the intent of our geotechnical recommendations for this project, the report is organized into two separate and equally important sections.

**Section I – Synopsis** is a summary of our geotechnical recommendations specific to this project.

**Section II - The Main Report** contains more detailed information including foundation and pavement design parameters and site work recommendations.

A study of both of the above referenced sections is recommended for the Project Team Members. Arias cautions that Section I is a consolidated quick reference overview of the more detailed geotechnical recommendations contained in Section II and should not be utilized exclusively from the remainder of the report.
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<td>Table 13</td>
<td>Pavement Design Parameters and Assumptions</td>
<td>II-13</td>
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<td>Fill Requirements and Subgrade Treatment Options</td>
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<td>Flexible Pavement Requirements</td>
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<td>Table 17</td>
<td>Rigid Pavement Section Materials</td>
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<td>Site Work (Non Structural/General Fill) Requirements</td>
<td>II-17</td>
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SECTION I:  SYNOPSIS

This synopsis includes a brief description of the project, subsurface findings, preferred foundation type, generalized earthwork requirements for construction, pavement recommendations, and specific items of concern from a geotechnical standpoint for consideration during the design, construction, and maintenance phases of this project.

Table 1: Project Description

| Project: | New Building Addition and Canopy Upgrades at Adams Hill Elementary School |
| Project Location: | 9627 Adams Hill Dr, San Antonio, TX 78245 |
| Proposed Development: | 1-Story Building Addition, Canopy Upgrades, and Pavements |
| Preferred Foundation Type: | Drilled Piers for the Canopies, and Driller Piers with a Suspended Floor Slab for the Building Addition |
| Improved Site Condition (Design PVR): | 1-inch |

Table 2: Existing Conditions at Time of Geotechnical Study

| Ground Cover: | Pavement and Landscaping |
| Predominant Soil Types: | Fat Clay (CH) and Lean Clay (CL) with sand and gravel percentages |
| Plasticity Index (PI): | Range: 32 - 60; Average: 50 |
| Groundwater Depth Measured: | At Approximately 33 feet During Field Exploration; See Table 6. |
| Estimated Potential Vertical Rise (PVR): | 5 to 6 inches |
### Table 3: Drilled Pier Foundation Recommendations

| Recommended Foundation Type: | Drilled Pier Foundations with suspended floor slab for Building Addition  
|                             | Individual Drilled Pier Foundation for each Canopy structure |
| Scarify, Moisten & Compact Exposed Subgrade (Building Addition): | 18 inches  
| | 18 inches  
| | Designed for positive drainage to maintain moisture conditions beneath the floor slab. A minimum 2% subgrade slope to appropriate sumps is recommended to prevent ponding of surface water. |
| Minimum Crawl Space, Void or Clear Space Between underlying subgrade soils and Floor Slab, Grade Beams and suspended utilities: | 18 inches  
| Minimum Pier Depth: | Straight shaft drilled Piers at least 30 feet below the existing surface.  
<p>| | Deeper depths may be required to resist compressive, uplift, pullout, or lateral loads as determined by the Project Structural Engineer. If piers are designed to be deeper than 40-feet, we should be contacted to provide additional borings and recommendations. |</p>
<table>
<thead>
<tr>
<th>Layer</th>
<th>Material</th>
<th>Flexible Asphaltic Concrete</th>
<th>Rigid Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Parking Drive, Truck Lane</td>
<td>Parking Drive, Truck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Area - Light Duty</td>
<td>Lane - Medium Duty</td>
</tr>
<tr>
<td>Surface</td>
<td>HMAC/PCC</td>
<td>2&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Base</td>
<td>Flexible Base</td>
<td>10&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Subgrade</td>
<td>Moisture conditioned flexible</td>
<td>&quot;6&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td></td>
<td>asphalt sections should also</td>
<td>&quot;6&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td></td>
<td>have Tensar TX-140 geogrid</td>
<td>*6&quot;</td>
<td>*6&quot;</td>
</tr>
<tr>
<td></td>
<td>installed over the 6-inch</td>
<td>*6&quot;</td>
<td>*6&quot;</td>
</tr>
<tr>
<td></td>
<td>moisture conditioned subgrade</td>
<td>*6&quot;</td>
<td>*6&quot;</td>
</tr>
</tbody>
</table>

**Notes:**

1. Pavements founded on top of expansive soils will be subjected to PVR soil movements estimated and presented in this report (*i.e.*, approximately 5-6 inches). These potential soil movements are typically activated to some degree during the life of the pavement. Consequently, pavements can be expected to crack and require periodic maintenance. Periodic/preventative maintenance should be planned for to reduce deterioration of the pavement structure while aiding to preserve the investment.

2. Light duty areas include parking and drive lanes that are subjected to passenger vehicle traffic only. Light duty areas exclude entrance aprons and drives into the site and single access route drive lanes to parking areas.

3. Medium duty areas include entrance aprons and drives into the site (such as school bus loading and unloading lanes), single access route drive lanes to parking areas, and areas where paving will be subjected to delivery truck traffic. Medium duty areas exclude areas where trucks may travel or park, and dock areas.

4. Heavy duty areas include areas subjected to 18-wheel tractor trailers, trash collection vehicles, dumpster pads including loading and unloading areas and the path of the dumpster truck from the street, and areas where truck turns and maneuvering may occur. **Eight (8)-inch thick concrete pavement is recommended for heavy duty areas and is not shown in Table 6.**

5. During the paving life, maintenance to seal surface cracks within concrete or asphalt paving and to reseal joints within concrete pavement should be undertaken to achieve the desired paving life. Perimeter drainage should be controlled to reduce the influx of surface water from areas surrounding the paving. Water penetration into base or subgrade materials, sometimes due to irrigation or surface water infiltration leads to pre-mature paving degradation. Curbs should be used in conjunction with paving to reduce potential for infiltration of moisture into the base course. Curbs should extend the full depth of the base course and should extend at least 3 inches into the underlying clayey subgrade. The base layer should be tied into the area inlets to drain water that may collect in the base.

6. For flexible pavements only where the moisture conditioned subgrade will be utilized, Tensar TX-140 geogrid should be installed over the 6-inch moisture conditioned subgrade.

7. Material specifications, construction considerations, and section requirements are presented under “Pavement Subgrade and Section Materials” included in Section II of this report.
## Table 5: Project Compaction, Moisture and Testing Requirements

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
<th>Percent Compaction</th>
<th>Optimum Moisture Content</th>
<th>Testing Requirement</th>
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</thead>
<tbody>
<tr>
<td><strong>Pavement Areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Scarified, Moisture</td>
<td>≥ 95%</td>
<td>0 to +4%</td>
<td>1 per 2,500 SF; min. 3</td>
<td></td>
</tr>
<tr>
<td>Conditioned On-site Soil</td>
<td></td>
<td></td>
<td></td>
<td>tests</td>
</tr>
<tr>
<td>(Subgrade)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Fill</td>
<td>≥ 95%</td>
<td>0 to +4%</td>
<td>1 per 2,500 SF; min. 3</td>
<td></td>
</tr>
<tr>
<td>(Onsite Material)</td>
<td></td>
<td></td>
<td></td>
<td>per lift</td>
</tr>
<tr>
<td>Base Material</td>
<td>≥ 95% (ASTM D 1557)</td>
<td>+3%</td>
<td>1 per 2,500 SF; min. 3</td>
<td></td>
</tr>
<tr>
<td>Hot-mix asphaltic</td>
<td>91% to 95% Theoretical Lab Density</td>
<td>Not applicable</td>
<td>1 per 2,500 SF; min. 3</td>
<td></td>
</tr>
<tr>
<td>concrete</td>
<td>(TEX 207 F)</td>
<td></td>
<td></td>
<td>per lift</td>
</tr>
<tr>
<td><strong>Non-Structural Areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Outside Building</td>
<td>≥ 95%</td>
<td>0% to +4%</td>
<td>1 per 2,500 SF; min. 3</td>
<td></td>
</tr>
<tr>
<td>Addition)</td>
<td></td>
<td></td>
<td></td>
<td>per lift</td>
</tr>
</tbody>
</table>
SECTION II: MAIN REPORT

PROJECT AND SITE DESCRIPTION

The proposed project will consist of the construction of new canopies, a one-story building addition, and new pavements at Adams Hill Elementary School, located at 9627 Adams Hill Dr, San Antonio, TX 78245. The new addition will be located on the northeast side of the existing school, and the new canopies will be located at the front drive of the existing building. Additional new associated parking areas are also planned as some of the current parking located off of Mossy Creek Drive will be removed and replaced during construction. A Site Vicinity Map is provided as Figure 1 in Appendix A.

Design details regarding the planned structure have not been provided, but we anticipate that the planned canopies and building addition will have column loads of approximately 25 to 100 kips and that each canopy structure will be supported on an individual drilled pier foundation and the building addition will be supported by a drilled pier foundation with a suspended floor slab.

This study was authorized on January 31, 2020 by the signing of Arias Proposal No. 2019-1093, dated December 6, 2019.

For the purposes of this geotechnical engineering study, we are assuming that the acceptable design PVR for the any grade supported structure is 1-inch. If a different foundation type or magnitude of PVR is desired, we should be contacted to provide additional recommendations.

SOIL BORINGS

Four (4) soil borings were drilled at the approximate locations shown on the Boring Location Plan provided as Figure 2 in Appendix A. The boring depths were measured from below the existing ground or pavement surface elevation that existed during our drilling and sampling activities on January 20, 2020.

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Structure</th>
<th>Depth, feet</th>
<th>Coordinates</th>
<th>Groundwater</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Latitude</td>
<td>Longitude</td>
</tr>
<tr>
<td>B-1</td>
<td>Addition</td>
<td>40</td>
<td>29.410000</td>
<td>-98.672556</td>
</tr>
<tr>
<td>B-2</td>
<td>Addition</td>
<td>40</td>
<td>29.410000</td>
<td>-98.672417</td>
</tr>
<tr>
<td>B-3</td>
<td>Canopy</td>
<td>40</td>
<td>29.409861</td>
<td>-98.672389</td>
</tr>
<tr>
<td>B-4</td>
<td>Pavement</td>
<td>10</td>
<td>29.409944</td>
<td>-98.672389</td>
</tr>
</tbody>
</table>
All of the borings were sampled in accordance with ASTM D1586 procedures for Split Spoon sampling techniques and in accordance with ASTM D 1587 thin wall tube sampling as described in Appendix C. A truck-mounted drill rig using continuous flight augers together with the sampling tool noted was used to secure the subsurface soil samples.

Soil classifications and borehole logging were conducted during the exploration by our engineering technician working under the supervision of the Project Geotechnical Engineer. Final soil classifications, as seen on the boring logs included in Appendix B, were determined by the Project Geotechnical Engineer based on laboratory and field test results and applicable ASTM procedures. A key to the terms and symbols used on the boring logs is also included in Appendix B.

LABORATORY TESTS

As a supplement to the field exploration, laboratory testing was performed to determine soil water content, Atterberg Limits, percent passing the US Standard No. 200 sieve, and unconfined compressive strength testing. The laboratory test results are reported in the attached boring logs included in Appendix B. The soil laboratory testing for this project was done in accordance with applicable ASTM procedures. Specifications and definitions for these tests are listed in the Appendix C.

Remaining soil samples recovered from this exploration will be routinely discarded following submittal of this report.

SUBSURFACE CONDITIONS

Generalized stratigraphy and groundwater conditions encountered are discussed in the following sections. The subsurface and groundwater conditions are based on conditions encountered at the boring locations to the depths explored.

Geology

The overall geology at the site consisted of Alluvium (Qal), overlying soils belonging to the Navarro Group (Kn).b

Alluvium (Qal) - Alluvium soils are water deposited and floodplain deposits and consist primarily of clays, along with various amounts of silt, sand, and gravel. These materials are typically tan to gray in color, although significant variation can happen across a project area due to their nature of creation and deposition. Localized zones of alluvial soils may include significant gravel deposits, which will typically contain angular, and cherty material. Because of the potential for increased permeability within the gravels relative to the much lower permeabilities of the underlying formational soils, a "perched" water zone could be encountered at the contact between the gravels and underlying clay formation.

Navarro Group (Kn) - The Navarro Group in San Antonio is a Late Cretaceous aged rock formation that consists primarily of mudstone and claystone, with some localized thin beds of
either sandstone or limestone. Claystone encountered would be montmorilanian, highly calcareous, aphanitic, light gray to dark gray, that contained thin beds of marine fossils. Upper members of the Navarro typically have a higher sand content, while lower members consist primarily of clay and silt. In the San Antonio area, the Navarro is upwards of 200 feet thick and is underlain by the Marlbrook Marl.

**Site Stratigraphy and Engineering Properties**

The generalized pavement sections and subsurface stratigraphy encountered at this site is summarized in the tables 7 and 8 below. The presence and thickness of the various subsurface materials can be expected to vary away from and between the exploration locations. The descriptions generally conform to the Unified Soils Classification System.

**Table 7: Existing Pavement Details**

<table>
<thead>
<tr>
<th>Boring</th>
<th>Asphalt (in)</th>
<th>Base (in)</th>
<th>Total (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-4</td>
<td>2.0</td>
<td>6.0</td>
<td>8.0</td>
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</table>

**Table 8: Generalized Soil Conditions**

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (ft)</th>
<th>Material Type</th>
<th>PI range</th>
<th>No. 200 range</th>
<th>PP range</th>
<th>N Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAVEMENT</td>
<td>0 to 0.75</td>
<td>2.0” Asphalt over 6.0” Base (Only encountered in B-4)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>0.75 to 10</td>
<td>Tan, Brown, Dark Brown, Gray – FAT CLAY (CH); FAT CLAY with SAND (CH); SANDY FAT CLAY (CH), LEAN CLAY (CL) – stiff to very hard</td>
<td>31 - 60</td>
<td>65 - 92</td>
<td>3.5 - 4.5+</td>
<td>9 - 50/5***</td>
</tr>
<tr>
<td>I</td>
<td>10 - 40</td>
<td>Gray – CLAYEY SAND with GRAVEL – medium dense (Only encountered in Boring B-2)</td>
<td>32*</td>
<td>38*</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

**Where:**
- Depth - Depth from existing ground surface at the time of geotechnical study, feet
- PI - Plasticity Index, %
- No. 200 - Percent passing #200 sieve, %
- PP - Pocket Penetrometer, tsf
- N - Standard Penetration Test (SPT) N-value, blows per foot
- ** - Denotes blows during seating penetration
- -- - No test taken in that stratum
- * - Only one test in that stratum
Groundwater

A dry soil sampling method was used to obtain the soil samples at the project site. Groundwater was encountered during the field exploration in three (3) of the borings on January 20, 2020. Groundwater readings are detailed above in Table 6. The open boreholes were backfilled using soil cuttings generated from the drilling process, and then patched with either cold mix asphalt or concrete to match existing surface, if required.

Groundwater levels will often change significantly over time and should be verified immediately prior to construction. Water levels in open boreholes may require several hours to several days to stabilize depending on the permeability of the soils. Groundwater levels at this site may differ during construction because fluctuations in groundwater levels can result from seasonal conditions, rainfall, drought, or temperature effects.

Pockets or seams of gravels, sands, silts or open fractures and joints can store and transmit “perched” groundwater flow or seepage. Should dewatering become necessary, it is considered means and methods and is solely the responsibility of the contractor.

MOISTURE VARIATIONS AND ESTIMATED MOVEMENT

Structural damage can be caused by volume changes in clay soils. Clays can shrink when they lose water and swell (grow in volume) when they gain water. The potential for expansive clays to shrink and swell is typically related to the Plasticity Index (PI). Clays with a higher PI generally have a greater potential for soil volume changes due to moisture content variations. The soils found at this site are capable of swelling and shrinking in volume dependent on potentially changing soil water content conditions during or after construction. The term swelling soils implies not only to the tendency to increase in volume when water is available, but also to decrease in volume or shrink if water is removed.

The measured PIs of the near-surface soil samples obtained at this site suggest that the soils have a very high potential for shrinking and swelling due to fluctuations in soil moisture content. Several methods exist to evaluate swell potential of expansive clay soils. We have estimated potential heave utilizing the TXDOT method (Tex 124-E). Using the TXDOT method, we estimate that the PVR is approximately 5 to 6 inches considering the existing soil moisture conditions at the time of the sampling activities.

It has been our experience that the PVR method can sometimes underestimate the potential shrink/swell movements. Fluctuations in the soil moisture content generated from climatic conditions (i.e., droughts or floods) or as a result of development (e.g., irrigation of landscaping in the immediate vicinity of the canopy foundations, poor surface drainage, leaking plumbing or water lines) may result in greater shrink/swell movements than calculated.
FOUNDATION DESIGN CONSIDERATIONS

Both shallow and deep foundation types are utilized in areas with expansive soils. Deep drilled piers are suited to structures with moderate to heavy loading conditions. The piers, when properly founded, can reduce foundation movement of the superstructure. Grade beams, isolated from the soil, typically span between the piers.

A shallow foundation type consisting of a slab-on-grade is a common alternate approach for small to moderate size structures. When founded within expansive soils, subgrade improvement is recommended in order to reduce potential soil and foundation movement to a magnitude acceptable to the owner and design team. Some aesthetic distress is normally acceptable to the owner and design team with this foundation alternative.

Each approach has its advantages and disadvantages in terms of cost and overall performance. Structures founded on expansive clay soils can be expected to experience some distress.

As previously noted in this report, expansive clays shrink when they lose water and swell or grow in volume when they gain water content. Change in soil moisture is the single most important factor affecting the shrinking and swelling of clays. Therefore, soils having a high Plasticity Index and located in an area that the soil moisture varies considerably from drought to wet seasons will typically experience the highest magnitude of foundation movement. Surface and subsurface drainage and the presence of trees and/or other large vegetation can also affect foundation performance significantly.

Structures constructed during dry periods on expansive soils generally experience the greatest amount of foundation movement. This is a result of water gaining access under the foundation. Water access under the foundation can occur from various sources including subsurface “perched” groundwater infiltration, poor surface drainage, leaking irrigation or plumbing lines, and/or climate change. Often, movement of a foundation placed on highly expansive clay will be minimal provided the soil moisture content remains stable over time. Although initial construction cost is generally higher, a structurally suspended floor slab system is often used instead of a soil supported floor slab on an improved building pad in order to reduce the risk of excessive foundation movements and floor/wall cracking due to moisture fluctuations in the expansive clays.

Recommended Foundation Type

Due to the high PVR (5 to 6 inches) at this site, we recommend that the building addition be supported on a drilled shaft foundation with a suspended floor slab. The new canopies can each be supported on a single drilled pier. The project team may determine that other foundation types are desired for this project during the design phase. Should an alternate foundation type be desired, we should be contacted to provide additional geotechnical design data for the alternate foundation type as a Supplement to this Geotechnical Report.
RECOMMENDATIONS FOR DRILLED PIERS

Straight shaft drilled piers can be used for the foundation for the building addition and canopy structures. Recommendations for evaluation of axial capacity and lateral capacity for the piers are presented in the following tables. Pier capacities for axial loading were evaluated based on design methodologies included in FHWA-IF-99-025 - Drilled Shafts: Construction Procedures and Design Methods.

Table 9: Drilled Pier Design Parameters Axial Capacity

<table>
<thead>
<tr>
<th>Depth</th>
<th>Material</th>
<th>Recommended Design Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Allowable Skin Friction, psf</td>
</tr>
<tr>
<td>0 to 5</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH)</td>
<td>NEGLECT</td>
</tr>
<tr>
<td>5 to 15</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH), SANDY FAT CLAY (CH)</td>
<td>250</td>
</tr>
<tr>
<td>15 to 30</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH), SANDY FAT CLAY (CH), LEAN CLAY (CL).</td>
<td>500</td>
</tr>
<tr>
<td>30 to 40</td>
<td>FAT CLAY (CH), LEAN CLAY (CL)</td>
<td>600</td>
</tr>
</tbody>
</table>

Constraints to be Imposed During Pier Design

- Minimum embedment depth: Straight shaft drilled Piers at least 30 feet below the existing surface.
  - Deeper depths may be required to resist compressive, uplift, pullout, or lateral loads as determined by the Project Structural Engineer. If piers are designed to be deeper than 40-feet, we should be contacted to provide additional borings and recommendations.

- Minimum shaft diameter: 18 inches

- Under reamed (belled) piers: Belled piers may be necessary in order to resist the uplift. The bell diameter should not be more than 3 times the shaft diameter

- Minimum Void Space Grade Beams, Pier Caps and suspended floor system (Building Addition Only): 18 inches

Notes:

1. For straight shaft piers, the contribution of the soils for the top 5 feet of soil embedment and for a length equal to at least 1 pier diameter from the bottom of the shaft should be neglected in determination of friction capacity for compression loading. The recommended design parameters include a factor of safety of 3 for end bearing and 2 for skin friction.

2. Total and differential settlement of piers are expected to be less than 1 inch and ½ inch, respectively. Estimated settlements are based on performance of properly installed piers in the South Texas areas. A detailed settlement estimate is outside of the scope of this service.

3. Sufficient reinforcing steel should be placed within the pier to account for tension and lateral loading as applicable. Pier vertical reinforcing steel should be designed to resist the uplift forces from swelling soils and uplift and lateral forces from wind loading. The final reinforcing requirements should be determined by...
the project structural engineer. Tensile rebar steel should be designed in accordance with ACI Code Requirements.

4. A minimum shaft diameter of 18 inches is recommended. Larger shaft diameters may be required. Straight-shaft piers should be spaced at least 3 diameters apart center-to-center. If the recommended pier spacing cannot be maintained, Arias should be consulted to consider the group effect of closely spaced piers.

5. The uplift force resulting from expansion of soils in the active zone may be computed using the above formula in Table 9 above where D is the shaft diameter in feet. For drilled straight-sided piers, the contribution from soils to resist uplift is the allowable skin friction resistance of the soils below the 15-ft deep estimated active zone. For uplift loading only, the allowable skin resistance for the bottom 1 pier diameter can be used. Sustained dead loads will also aid in resisting uplift forces. Pier depths greater than 30 feet may be required to: (1) resist expansive soil uplift forces, and/or (2) as a result of axial or lateral loading requirements. It should also be noted that relatively shallow piers at this site will be subject to the potential magnitude of PVR movements as noted previously. In addition, shallow piers may exhibit rotation, tilt, etc. The Owner and Design Team must understand and accept the risks associated with shallow piers at this site.

6. Uplift resistance can also be increased by installing a bell at the planned bearing depth. The uplift resistance for an underreamed (belled) pier can be evaluated by utilizing the bell as an anchor. For this case, the diameter of the bell may be evaluated by equating the net upward force (uplift force less sustained compressive load) to the soil bearing capacity above the bell as determined by the following formula:

\[
UR_{\text{net}} = 9 \times (B^2 - D^2)
\]

Where:  
\( UR_{\text{net}} \) = net upward resistance in kips 
\( B \) = under-ream diameter in feet 
\( D \) = shaft diameter in feet

7. If bells are used, the piers should be spaced at a minimum of 2 bell diameters apart measured from the center of each pier. If the recommended pier spacing of the belled piers cannot be maintained, Arias should be consulted to consider the group effect of closely spaced piers.

Lateral pile analyses including capacity, maximum shear, and maximum bending moment will be evaluated by the project structural engineer using LPILE or similar software. In the following table, Arias presents geotechnical input parameters for the encountered soils at the project site. Please note that the depths to the top and bottom of each layer were interpreted using approximate elevation data at the explored boring locations and layer boundaries as shown on the boring logs.

### Table 10: Drilled Pier Geotechnical Input Parameters for LPILE Analyses

<table>
<thead>
<tr>
<th>Depth, Feet</th>
<th>Description</th>
<th>LPILE Soil Type</th>
<th>( \gamma_e )</th>
<th>( C_u )</th>
<th>( \phi )</th>
<th>( K ) Static / Cyclic</th>
<th>( e_{50} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH)</td>
<td></td>
<td>NEGLECT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 to 15</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH), SANDY FAT CLAY (CH)</td>
<td>Stiff Clay</td>
<td>120</td>
<td>1,000</td>
<td>0</td>
<td>100/0</td>
<td>0.10</td>
</tr>
<tr>
<td>15 to 30</td>
<td>FAT CLAY (CH), FAT CLAY with SAND (CH), SANDY FAT CLAY (CH), LEAN CLAY (CL),</td>
<td>Stiff Clay</td>
<td>120</td>
<td>2,000</td>
<td>0</td>
<td>400/200</td>
<td>0.075</td>
</tr>
<tr>
<td>30 to 40</td>
<td>FAT CLAY (CH), LEAN CLAY (CL)</td>
<td>Stiff Clay</td>
<td>120</td>
<td>3,000</td>
<td>0</td>
<td>700/300</td>
<td>0.006</td>
</tr>
</tbody>
</table>
**Where:**

- $\gamma_e$ = effective soil unit weight, pcf
- $c_u$ = undrained soil shear strength, psf
- $\phi$ = undrained angle of internal friction, degrees
- $K$ = soil modulus, pci
- $e_{50}$ = 50% strain value

**Suspended Floor Slab**

A void space, or crawl space, of at least 18 inches must be constructed to isolate the suspended slab and grade beams from the soil subgrade. Construction options to create this void space may include the use of cardboard carton forms (void boxes), soil retainers, and/or formwork. The use of a suspended floor slab should significantly reduce the chances for differential vertical foundation movement and distress associated with the highly expansive soils encountered at this site. However, even with this system some nominal upward movement may occur.

If void boxes are used to create the void beneath the floor slab, care must be taken not to damage the boxes prior to or during concrete placement. The void boxes should be protected from the elements (rain and excessive moisture) at all times. The void boxes should have a tight fit to the pier foundations. Furthermore, the void boxes should be designed to deteriorate properly after construction so that pressures from swelling soils will collapse the carton forms rather than be transmitted to the overlying grade beams and/or floor slab. The carton form supplier should provide a technical representative to attend a preconstruction meeting, and to also be present during the start of foundation construction, to instruct the workforce in proper carton form construction techniques.

Soil retainers such as precast concrete panels should be placed vertically along the exterior grade beams to: (1) prevent soil from sloughing under the grade beams; and (2) reduce the risk of significant water from migrating into the void space under the floor system. Backfill against the retainers and exterior grade beams should consist of compacted clay soil to aid in preventing the easy movement of outside surface water from infiltrating under the floor system. The backfill clay soil should be compacted to at least 95 percent of the Standard Proctor maximum dry density as evaluated by ASTM D 698 at moisture contents ranging from optimum to plus four (+4) percentage points of optimum moisture content.

Positive drainage should also be provided for the building addition so that surface water does not enter beneath the foundation or enter into air vents that may be situated in the exterior grade beam. Roof drains should be tied to storm drains or be discharged on top of pavements well outside of the building footprint.

Formwork other than carton forms may be used to create the crawl space beneath the building. Provisions should be made to collect and dispose of any surface and/or subsurface water that may enter in the crawl space. This can generally be accomplished by constructing a 4-inch-thick unreinforced lean concrete slab or “mudmat” on the surface of the crawl space.
beneath the concrete floor. The surface of the “mudmat” should be sloped to drain to a sump where the water can be collected and pumped away from the building. These steps can help reduce the potential for soil moisture fluctuations under the floor which can often lead to pier and floor movement. Proper ventilation should be provided to help limit moisture from collecting in the crawl space. In some instances, forced-air-ventilation/circulation is used to reduce moisture accumulation and humidity in the crawl space. Mold growth may occur if the crawl space is not adequately ventilated.

*It should also be noted that the subsurface materials encountered in our borings generally consisted of stiff to hard clays and very hard clays. Thus, we anticipate that high-torque drilling equipment will be required for pier installation at this site. Groundwater was also encountered at the time of our drilling activities. Therefore, temporary casing may also be required for pier installation at this site. The Contractor should be familiar with and prepared for such conditions. See Table 12 for Pier Construction Recommendations*

**Design Measures to Reduce Changes in Soil Moisture**

Although a drilled shaft foundation system with a suspended floor slab for the Building Addition is recommended to reduce potential shrink/swell related foundation movements, the design and construction of a of the foundation should also include the following elements:

- Roof drainage should be controlled by gutters and carried well away from the building. The ground surface adjacent to the perimeter should be sloped and maintained a minimum of 5% grade away from the sidewalks for 10 feet to result in positive surface flow or drainage away from the perimeter.

- Hose bibs, sprinkler heads, and other external water connections should be placed well away from the foundation perimeter such that surface leakage cannot readily infiltrate into the subsurface or compacted fills placed under the proposed foundations and slabs.

- No trees or other vegetation over six (6) feet in height shall be planted within 20 feet of the structure unless specifically accounted for in the foundation design.

- Paved areas around the structure are helpful in maintaining equilibrium within the soil water content. If possible, pavement and sidewalks should be located immediately adjacent to, and sloped away from the new sidewalks.

- Flower beds and planter boxes should be piped or watertight to prevent water infiltration under the sidewalks. Experience indicates that landscape irrigation is a common source of foundation movement problems and pavement distress.

- Site work excavations should be protected and backfilled without delay to reduce changes in the natural moisture regime.
See **ADDITIONAL DESIGN CONSIDERATIONS** shown subsequently for further discussion of utilities.

**Flatwork Considerations**

Minor differential movements between the planned structure and abutting sidewalks should be expected if the flatwork is supported on similar conditions. Flatwork supported on the unimproved, natural site conditions will result in foundation movements of the magnitudes reported in the PVR section. We recommend that the flatwork and the canopies be designed to include details that permit foundation movements without resulting in vertical separations and without distressing either element. Control joints should include steel reinforcing to prevent vertical shear, but to allow bending.

The flatwork and abutting sidewalks should be designed and constructed to allow for positive drainage away from the foundation. The planned site grading should allow for potential future differential movements and should **never** be allowed to reach a level or negative slope that promotes drainage toward the foundation.

**IBC Site Classification and Seismic Design Coefficients**

Section 1613 of the International Building Code (2015) requires that every structure be designed and constructed to resist the effects of earthquake motions, with the seismic design category to be determined in accordance with Section 1613 or ASCE 7. Site classification according to the International Building Code (2015) is based on the soil profile encountered to the 100-foot depth. The stratigraphy at the site location was explored to a maximum 40-foot depth.

Soils having similar consistency were extrapolated to be present between the 40 and 100-foot depths. On the basis of the site class definitions included in the 2015 Code and the encountered generalized stratigraphy, we characterize the site as Site Class D.

Seismic design coefficients were determined using the on-line software, Seismic Hazard Curves and Uniform Response Spectra, version 5.1.0, dated February 10, 2011 accessed at [http://earthquake.usgs.gov/hazards/designmaps/javacalc.php](http://earthquake.usgs.gov/hazards/designmaps/javacalc.php). Analyses were performed considering the 2015 International Building Code. Input included GPS coordinates and Site Class D. Seismic design parameters for the site are summarized in the following table.

<table>
<thead>
<tr>
<th>Site Classification</th>
<th>$F_a$</th>
<th>$F_v$</th>
<th>$S_s$</th>
<th>$S_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1.6</td>
<td>2.4</td>
<td>0.076g</td>
<td>0.025g</td>
</tr>
</tbody>
</table>

*Where:*

- $F_a$ = Site coefficient
- $F_v$ = Site coefficient
- $S_s$ = Mapped spectral response acceleration for short periods
- $S_1$ = Mapped spectral response acceleration for a 1-second period
ADDITIONAL DESIGN CONSIDERATIONS

Utilities
Utilities which go through the slabs should be designed with some flexibility to allow free movement in the lines as a result of potential soil shrinkage or swelling.

INSTALLATION RECOMMENDATIONS

Site Preparation
Strip away any existing topsoil, grass, organics, and deleterious debris as needed and dispose outside of the foundation area.

Drilled Pier Construction Considerations
The contractor should verify groundwater conditions before production pier installation begins. Comments pertaining to high-torque drilling equipment, groundwater, slurry, and temporary casing are based on generalized conditions encountered at the explored locations. Conditions at individual pier locations may differ from those presented and may require that these issues be implemented to successfully install piers. Construction considerations for drilled pier foundations are outlined in the following table.
**Table 12: Drilled Pier Installation Considerations**

<table>
<thead>
<tr>
<th>Recommended installation procedure</th>
<th>FHWA-NHI-10-016, May 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-torque drilling equipment anticipated</td>
<td>Yes; hard soils were encountered</td>
</tr>
<tr>
<td>Groundwater anticipated</td>
<td>Potentially, groundwater was encountered in the borings during drilling (see Table 6). Contractor should be prepared for such conditions.</td>
</tr>
<tr>
<td>Temporary casing anticipated</td>
<td>Potentially, the extent of casing use depends upon subsurface soil and groundwater conditions encountered during construction. Contractor should be prepared for such conditions.</td>
</tr>
<tr>
<td>Slurry installation anticipated</td>
<td>Possible if subsurface soil and groundwater conditions dictate.</td>
</tr>
<tr>
<td>Concrete placement</td>
<td>Same day as drilling. If a pier excavation cannot be drilled and filled with concrete on the same day, temporary casing or slurry may be needed to maintain an open excavation.</td>
</tr>
<tr>
<td><strong>Maximum water accumulation in excavation</strong></td>
<td><strong>2 inches MAXIMUM</strong></td>
</tr>
<tr>
<td>Concrete installation method needed if water accumulates</td>
<td>Tremie, or pump to displace water. If tremie is used, care should be taken to place the tremie in the center of the shaft and not allow the concrete to ricochet of shaft walls and/or reinforcing steel. Pump discharge should be placed at the bottom of the shaft to start so that groundwater is forced to the top of the concrete.</td>
</tr>
<tr>
<td>Quality assurance monitoring</td>
<td>Geotechnical engineer’s representative should be present during drilling of all piers, should observe drilling and verify the installed depth, should verify material type at the base of excavation, cleanliness of base, depth of existing groundwater, if present, and should observe placement of reinforcing and placement of concrete.</td>
</tr>
</tbody>
</table>

**Notes:**

1. The contractor should verify groundwater conditions before production pier installation begins. Temporary casing may be needed due to groundwater conditions, dependent on seasonal conditions. Payment provisions for temporary casing and for placement of concrete by the tremie method are recommended for inclusion in the Contract Documents.

2. Comments pertaining to high-torque drilling equipment, groundwater, temporary casing, and slurry drilling methods are based on generalized conditions encountered at the explored locations. Importantly, these are considered means and methods and are the sole responsibility of the contractor. Conditions at individual pier locations may differ from those presented and may require that these techniques be implemented to successfully install piers.

3. The following installation techniques will aid in successful construction of the shafts:
   a. The clear spacing between rebar or behind the rebar cage should be at least 3 times the maximum size of coarse aggregate.
   b. Centralizers on the rebar cage should be installed to keep the cage properly positioned.
   c. Cross-bracing of a reinforcing cage may be used when fabricating, transporting, and/or lifting. However, experience has shown that cross-bracing can contribute to the development of voids in a concrete shaft. Therefore, we recommend the removal of the cross-bracing prior to lowering the cage in the open shaft.
d. The use of a tremie should be employed so that concrete is directed in a controlled manner down the center of the shaft to the shaft bottom. The concrete should not be allowed to ricochet off the pier reinforcing steel nor off the pier side walls.

e. The pier concrete should be designed to achieve the desired design strength when placed at a 7-inch slump, plus or minus 1-inch tolerance. Adding water to a mix designed for a lower slump does not meet these recommendations.

PAVEMENT RECOMMENDATIONS

Pavement Design Parameters and Assumptions

The pavement recommendations were prepared in accordance with the 1993 AASHTO Guide for the Design of Pavement Structures for asphalt and the ACI 330R (Guide for Design and Construction of Concrete Parking Lots) for concrete. No traffic specific design information was received for this project therefore, the following design parameters and assumptions were used in our analysis:

<table>
<thead>
<tr>
<th>Traffic Load for Light Duty Pavement</th>
<th>15,000 equivalent single axle loads (ESALs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Load for Medium Duty Pavement</td>
<td>50,000 equivalent single axle loads (ESALs)</td>
</tr>
<tr>
<td>Average Daily Truck Traffic vehicle with at least 6 Wheels</td>
<td>One (1)</td>
</tr>
<tr>
<td>Concrete Compressive Strength</td>
<td>4,000 psi</td>
</tr>
<tr>
<td>Raw Subgrade California Bearing Ratio (CBR)</td>
<td>2.0 for clayey subgrade</td>
</tr>
<tr>
<td>Raw Subgrade Modulus of Subgrade Reaction, k in pci</td>
<td>75 for clayey subgrade</td>
</tr>
</tbody>
</table>

Options for section thickness for flexible and rigid pavements are provided in SECTION I: SYNOPSIS, Table 4. Note that the truck lane traffic sections correspond to only one heavy-duty truck per day. If more heavy-duty truck traffic is anticipated, we recommend the use of an eight (8)-inch thick concrete pavement.

A truck traffic section (8-inches thick) is recommended for use at loading docks, entrances, driveways, dumpster pads and channeled traffic areas. Areas subjected to truck traffic stopping, starting, loading, unloading or turning should not utilize asphalt pavement. For these areas, a concrete section is recommended. The 8-inch truck traffic section is not shown in Table 4.

Rigid Concrete Pavement Joints

Placement of expansion joints in concrete paving on potentially expansive subgrade or on granular subgrade subject to piping often results in horizontal and vertical movement at the joint. Many times, concrete spalls adjacent to the joint and eventually a failed concrete area is the result. This problem is primarily related to water infiltration through the joint.
One method to mitigate the problem of water infiltration through the joints is to eliminate all expansion joints that are not absolutely necessary. It is our opinion that expansion or isolation joints are needed only adjacent where the pavement abuts intersecting drive lanes and other structures. Elimination of all expansion joints within the main body of the pavement area would significantly reduce access of moisture into the subgrade. Regardless of the type of expansion joint sealant used, eventually openings in the sealant occur resulting in water infiltration into the subgrade.

The use of sawed and sealed joints should be designed in accordance with current Portland Cement Association (PCA) or American Concrete Institute (ACI) guidelines. Research has proven that joint design and layout can have a significant effect on the overall performance of concrete pavement.

Recommendations presented herein are based on the use of reinforced concrete pavement. Local experience has shown that the use of distributed steel placed at a distance of 1/3 slab thickness from the top is of benefit in crack control for concrete pavements. Improved crack control also reduces the potential for water infiltration.

**Performance Considerations**

Our pavement recommendations have been developed to provide an adequate structural thickness to support the anticipated traffic volumes shown in Table 13. Some shrink/swell movements due to moisture variations in the underlying soils, or potential movement from settling utility backfill material, should be anticipated over the life of the pavements. The owner should recognize that over a period of time, pavements may crack and undergo some deterioration and loss of serviceability. We recommend the project budgets include an allowance for maintenance such as patching of cracks or occasional overlays over the life of the pavement.

**Pavement Subgrade and Section Materials**

Recommendations for the planned pavement subgrade and section materials are shown in tables 14 through 17:
### Table 14: Pavement Subgrade Materials

<table>
<thead>
<tr>
<th>Subgrade Preparation Prior to Paving Section Construction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum undercut depth</td>
<td>6 inches or as needed to remove organics and existing pavement/foundations</td>
</tr>
<tr>
<td>Reuse excavated soils</td>
<td>Provided they are free of roots and debris and meet the material requirements for their intended use</td>
</tr>
<tr>
<td>Horizontal extent for undercut</td>
<td>2 feet beyond the paving limits</td>
</tr>
<tr>
<td>Exposed subgrade treatment (before moisture conditioning or lime treatment)</td>
<td>Proof rolling the subgrade is very important. Proof roll with rubber-tired vehicle weighing at least 20 tons such as a loaded dump truck with Geotechnical Engineer’s representative present during proof rolling.</td>
</tr>
<tr>
<td>Pumping/rutting areas discovered during proof rolling</td>
<td>Pumping and rutting areas should be removed to firmer materials and replace with compacted general or select fill under direction of Geotechnical Engineer’s representative</td>
</tr>
</tbody>
</table>

### Table 15: Fill Requirements and Subgrade Treatment Options

<table>
<thead>
<tr>
<th>Fill Requirements for Grade Increases</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General fill type</td>
<td>Material free of roots, debris and other deleterious material with a maximum rock size of 3 inches; on-site clays having CBR &gt; 2.0 may be used</td>
</tr>
<tr>
<td>Minimum general fill thickness</td>
<td>As required to achieve grade</td>
</tr>
<tr>
<td>Maximum general fill loose lift thickness</td>
<td>8 inches</td>
</tr>
<tr>
<td>General fill compaction and moisture criteria</td>
<td>ASTM D 698 ≥ 95% compaction at 0 to +4 from optimum</td>
</tr>
</tbody>
</table>

### Subgrade Treatment Option - Moisture Conditioning

| Depth of moisture conditioning | 9 inches (disk in place and moisture condition) |
| Compaction and moisture criteria | ASTM D 698 ≥ 95% compaction at 0 to +4 from optimum |

### In-Place Density and Moisture Verification Testing

| Testing frequency (Subgrade) | 1 test per 2,500 square feet with minimum of 3 tests |

### Table 16: Flexible Pavement Requirements

<table>
<thead>
<tr>
<th>Flexible Pavement Section Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible Base Material Type</td>
<td>2004 TxDOT Item 247, Type A, Grade 1 or 2</td>
</tr>
<tr>
<td>Maximum Flexible Base Loose Lift Thickness</td>
<td>9 inches</td>
</tr>
<tr>
<td>Flexible Base Placement Criteria</td>
<td>Compact to ≥ 95% maximum dry density at -3 to +3 percentage points of optimum moisture content (ASTM D 1557)</td>
</tr>
<tr>
<td>Hot Mix Asphaltic Concrete (HMAC) Type</td>
<td>2004 TxDOT Item 340, Type D</td>
</tr>
<tr>
<td>HMAC Placement Criteria</td>
<td>91% to 95% Theoretical Lab Density (TEX 207 F)</td>
</tr>
</tbody>
</table>
### Table 17: Rigid Pavement Section Materials

<table>
<thead>
<tr>
<th>Portland Cement Concrete Section Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum compressive strength at 28 days</strong></td>
</tr>
<tr>
<td><strong>Desired slump during placement</strong></td>
</tr>
<tr>
<td><strong>Reinforced Steel</strong></td>
</tr>
<tr>
<td><strong>Construction Joint Dowels</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Expansion Joints</strong></td>
</tr>
<tr>
<td><strong>Contraction Joints – transverse and longitudinal</strong></td>
</tr>
<tr>
<td><strong>Placement</strong></td>
</tr>
</tbody>
</table>

To help reduce degradation of the prepared subgrade, paving preferably should be placed within 14 days. If pavement placement is delayed, protection of the subgrade surface with an emulsion-based sealer should be considered.

### CONSTRUCTION CRITERIA

**Site Preparation**

Strip away any existing asphalt, concrete, topsoil, grass, organics, soft or wet materials, and deleterious debris as needed and dispose outside of the building addition, canopies, and pavement areas. Undercut to the required depth and extent as noted in the main report. Additional excavation may be required to remove existing fill materials, utilities or foundations. Additional excavation may also be necessary due to encountering deleterious materials such as buried debris and/or rubble, or undesirable soft and wet subgrade conditions and/or existing fill materials. The site representative of the geotechnical engineer should observe undercutting operations. Unless passing density reports are provided for a specific area, existing fill soils found during the excavation should be considered as uncertified and removed to suitable natural soils.

After the surface materials are removed, the exposed pavement subgrade surface should be proof rolled with a heavily loaded dump truck weighing at least 20 tons. Any areas which excessively yield or pump under the wheel loading should be undercut to the depth specified by the geotechnical engineer’s representative and replaced with compacted select fill to
existing grade as specified. The voids in undercut areas can be backfilled and compacted with on-site general fill materials.

### Table 18: Site Work (Non Structural/General Fill) Requirements

<table>
<thead>
<tr>
<th>Stripping Depth</th>
<th>6-inch minimum or as needed to remove any existing asphalt, concrete, and vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Structural/General Fill Type</td>
<td>On-site material free of roots, debris and other deleterious material with a maximum particle size of 4 inches</td>
</tr>
<tr>
<td>Maximum Non-Structural/General Fill Loose Lift Thickness</td>
<td>9 inches</td>
</tr>
</tbody>
</table>

The backfill should be placed and compacted in accordance with the General Fill requirements in Table 6 in Section I.

At least one (1) density test should be conducted per 2,500 square feet of sidewalk per lift of prepared fill and subgrade or a minimum of three (3) density tests should be taken per lift.

**Drainage**

Good positive drainage during and after construction is very important to reduce expansive soil volume changes that can detrimentally affect the performance of the planned development. Proper attention to surface and subsurface drainage details during the design and construction phase of development can aid in preventing many potential soil shrink-swell related problems during and following the completion of the project.

**Earthwork and Foundation Acceptance**

Exposure to the environment may weaken the soils at the foundation bearing level if the excavation remains open for long periods of time. Therefore, it is recommended that all foundation excavations be extended to final grade and constructed as soon as possible in order to reduce potential damage to the bearing soils. If bearing soils are exposed to severe drying or wetting, the unsuitable soil must be re-conditioned or removed as appropriate and replaced with compacted fill, prior to concreting. The foundation bearing level should be free of loose soil, ponded water or debris and should be observed prior to concreting by the geotechnical engineer or his representative.

Foundation concrete should not be placed on soils that have been disturbed by rainfall or seepage. If the bearing soils are softened by surface water intrusion during exposure or by desiccation, the unsuitable soils must be removed from the foundation excavation and replaced with compacted select fill prior to placement of concrete.

Subgrade preparation and fill placement operations should be monitored by the geotechnical engineer or his representative. As a guideline, at least one in-place density test should be
performed for each 2,500 sq. ft. of compacted surface per lift or a minimum of three (3) tests per lift. Any areas not meeting the required compaction should be recompacted and retested until compliance is met.

**GENERAL COMMENTS**

The scope of this study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation and pavement designs. Environmental studies of any kind were not a part of our scope of work or services even though we are capable of providing such services.

This report was prepared as an instrument of service for this project exclusively for the use of Northside Independent School District and the project design team. If the development plans change relative to site layout, size, grades, or anticipated loads or if different subsurface conditions are encountered, we should be informed and retained to ascertain the impact of these changes on our recommendations. We cannot be responsible for the potential impact of these changes if we are not informed.

**Geotechnical Design Review**

Arias should be given the opportunity to review the design and construction documents. The purpose of this review is to check to see if our geotechnical recommendations are properly interpreted into the project plans and specifications. Please note that design review was not included in the authorized scope and additional fees may apply.

**Subsurface Variations**

Soil and groundwater conditions may vary between the sample boring locations. Transition boundaries or contacts, noted on the boring logs to separate soil types, are approximate. Actual contacts may be gradual and vary at different locations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions or highly variable subsurface conditions are encountered during construction, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

**Quality Assurance Testing**

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. As Geotechnical Engineer of Record (GER), we should be engaged by the Owner to provide Quality Assurance (QA) testing. Our services will be to evaluate the degree to which constructors are achieving the specified conditions they’re contractually obligated to achieve and observe that the encountered materials during earthwork for foundation and pavement installation are consistent with those encountered during this study. In the event that Arias is not retained to provide QA testing, we should be immediately contacted if differing
subsurface conditions are encountered during construction. Differing materials may require modification to the recommendations that we provided herein. A message to the Owner with regard to the project QA is provided in the GBA publication included in Appendix E.

Arias has an established in-house laboratory that meets the standards of the American Standard Testing Materials (ASTM) specifications of ASTM E-329 defining requirements for Inspection and Testing Agencies for soil, concrete, steel and bituminous materials as used in construction. We maintain soils, concrete, asphalt, and aggregate testing equipment to provide the testing needs required by the project specifications. All of our equipment is calibrated by an independent testing agency in accordance with the National Bureau of Standards. In addition, Arias is accredited by the American Association of State Highway & Transportation Officials (AASHTO), the United States Army Corps of Engineers (USACE) and the Texas Department of Transportation (TxDOT), and also maintains AASHTO Materials Reference Laboratory (AMRL) and Cement and Concrete Reference Laboratory (CCRL) proficiency sampling, assessments and inspections.

Furthermore, Arias employs a technical staff certified through the following agencies: The National Institute for Certification in Engineering Technologies (NICET), the American Concrete Institute (ACI), the American Welding Society (AWS), the Precast/Prestressed Concrete Institute (PCI), the Mine & Safety Health Administration (MSHA), the Texas Asphalt Pavement Association (TXAPA) and the Texas Board of Professional Engineers (TBPE). Our services are conducted under the guidance and direction of a Professional Engineer (P.E.) licensed to work in the State of Texas, as required by law.

**Standard of Care**

Subject to the limitations inherent in the agreed scope of services as to the degree of care and amount of time and expenses to be incurred, and subject to any other limitations contained in the agreement for this work, Arias has performed its services consistent with that level of care and skill ordinarily exercised by other professional engineers practicing in the same locale and under similar circumstances at the time the services were performed.

Information about this geotechnical report is provided in the GBA publication included in Appendix D.
APPENDIX A: FIGURES AND SITE PHOTOGRAPHS
VICINITY MAP

New Classroom and Canopy Upgrades at Adams Hill Elementary School

9627 Adams Hill Dr, San Antonio, TX 78245

Figure 1

Drawn By: RWL
Checked By: JDS
Approved By: SAH
Scale: N.T.S.
BORING LOCATION PLAN

New Classroom and Canopy Upgrades at Adams Hill Elementary School

9627 Adams Hill Dr, San Antonio, TX 78245

Date: February 5, 2020  Job No.: 2019-1083

Drawn By: KMC  Checked By: JDS
Approved By: SAH  Scale: N.T.S.

Figure 2
Photo 1 – View looking at B-2 drilling operations.

Photo 2 – View looking at B-4 drilling operations.

SITE PHOTOS
New Classroom and Canopy Upgrades at Adams Hill Elementary School
9627 Adams Hill Dr, San Antonio, Texas 78245

Date: February 10, 2020
Job No.: 2019-1083
Drawn By: RWL
Checked By: KMC
Approved By: JDS
Scale: N.T.S.
APPENDIX B: BORING LOGS AND SYMBOL KEY SHEET
**Boring Log No. B-1**

**Project:** Adams Hill Elementary School  
New Canopies and Building Addition  
9627 Adams Hill Dr, San Antonio, TX 78245,  
Location: Building Addition: See Boring Location Plan  
**Sampling Date:** 1/20/20  
**Coordinates:** N29°24'36" W98°40'21.2"

### Soil Description

<table>
<thead>
<tr>
<th>Soil Description</th>
<th>Depth (ft)</th>
<th>SN</th>
<th>WC</th>
<th>PL</th>
<th>LL</th>
<th>PI</th>
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<th>-200</th>
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<tr>
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<tr>
<td>FAT CLAY (CH), very stiff, brown</td>
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<td>21</td>
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**Groundwater Data:**  
First encountered during drilling: 32.5-ft depth  
After 1 hour: 28.7-ft depth (32.6-ft open borehole depth)

**Field Drilling Data:**  
Coordinates: Hand-held GPS Unit  
Logged By: R. Arizola  
Driller: Eagle Drilling, Inc.  
Equipment: Truck-mounted drill rig  
Single flight auger: 0 - 38 ft

**Nomenclature Used on Boring Log**

- Thin-walled tube (T)  
- Split Spoon (SS)  
- Water encountered during drilling  
- Delayed water reading

**Arias Geoprofessionals**

Job No.: 2019-1083
## Boring Log No. B-1 (continued)

<table>
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<tr>
<th>Soil Description</th>
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<th>LL</th>
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<th>-200</th>
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<td></td>
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</table>

Borehole terminated at 40 feet

**Groundwater Data:**
- First encountered during drilling: 32.5-ft depth
- After 1 hour: 28.7-ft depth (32.6-ft open borehole depth)

**Field Drilling Data:**
- Coordinates: Hand-held GPS Unit
- Logged By: R. Arizola
- Driller: Eagle Drilling, Inc.
- Equipment: Truck-mounted drill rig
- Single flight auger: 0 - 38 ft

**Nomenclature Used on Boring Log**
- Thin-walled tube (T)
- Split Spoon (SS)
- Water encountered during drilling
- Delayed water reading

**Abbriviations Used:***
- WC = Water Content (%)
- PL = Plastic Limit
- LL = Liquid Limit
- PI = Plasticity Index
- PP = Pocket Penetrometer (tsf)
- N = SPT Blow Count
- ** = Blow Counts During Seating
- Uc = Compressive Strength (tsf)
- -200 = % Passing #200 Sieve
- DD = Dry Density (pcf)
### Soils Described

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<td>22</td>
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<td>56</td>
<td>4.5+</td>
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<td>4.5</td>
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### Field Drilling Data

- **Coordinates:** Hand-held GPS Unit
- **Logged By:** R. Arizola
- **Driller:** Eagle Drilling, Inc.
- **Equipment:** Truck-mounted drill rig
- **Single flight auger:** 0 - 39 ft

### Nomenclature Used on Boring Log

- **Split Spoon (SS)**
- **Thin-walled tube (T)**
- **Water encountered during drilling**
- **Delayed water reading**

### Groundwater Data

- First encountered during drilling: 33-ft depth
- After 1 hour: 16.5-ft depth (37.6-ft open borehole depth)

### Sampling Date

- 1/20/20

### Location

- **Building Addition:** See Boring Location Plan

---

**Project:** Adams Hill Elementary School
**New Canopies and Building Addition**
9627 Adams Hill Dr, San Antonio, TX 78245,
### Boring Log No. B-2 (continued)

**Project:** Adams Hill Elementary School  
New Canopies and Building Addition  
9627 Adams Hill Dr, San Antonio, TX 78245,  
**Sampling Date:** 1/20/20

**Location:** Building Addition: See Boring Location Plan  
**Coordinates:** N29°24'36" W98°40'20.7"

<table>
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<tr>
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<th>SN</th>
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<th>PL</th>
<th>LL</th>
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<th>-200</th>
<th>DD</th>
<th>Uc</th>
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<tbody>
<tr>
<td>FAT CLAY (CH), very stiff, brown (continued)</td>
<td></td>
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<td>32</td>
<td></td>
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<td>38</td>
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<tr>
<td>CLAYEY SAND with Gravel (SC), medium dense, gray</td>
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</tbody>
</table>

Borehole terminated at 40 feet

### Groundwater Data:
First encountered during drilling: 33-ft depth  
After 1 hour: 16.5-ft depth (37.6-ft open borehole depth)

### Field Drilling Data:
Coordinates: Hand-held GPS Unit  
Logged By: R. Arizola  
Driller: Eagle Drilling, Inc.  
Equipment: Truck-mounted drill rig  
Single flight auger: 0 - 39 ft

### Nomenclature Used on Boring Log:
- Split Spoon (SS)
- Thin-walled tube (T)
- Water encountered during drilling
- Delayed water reading

- WC = Water Content (%)  
- PL = Plastic Limit  
- LL = Liquid Limit  
- PI = Plasticity Index  
- PP = Pocket Penetrometer (tsf)  
- N = SPT Blow Count  
- -200 = % Passing #200 Sieve  
- DD = Dry Density (pcf)  
- Uc = Compressive Strength (tsf)

Arias Geoprofessionals  
Job No.: 2019-1083
Boring Log No. B-3

Project: Adams Hill Elementary School
New Canopies and Building Addition
9627 Adams Hill Dr, San Antonio, TX 78245,

Location: Canopies: See Boring Location Plan

Sampling Date: 1/20/20

Coordinates: N29°24'35.5" W98°40'20.6"

Backfill: Cuttings

Soil Description

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<th>Depth (ft)</th>
<th>SN</th>
<th>WC</th>
<th>PL</th>
<th>LL</th>
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Nomenclature Used on Boring Log

- Split Spoon (SS)
- Thin-walled tube (T)

Groundwater Data:
First encountered during drilling: 33-ft depth
After 20 minutes: 29.6-ft depth (37.2-ft open borehole depth)

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: R. Arizola
Driller: Eagle Drilling, Inc.
Equipment: Truck-mounted drill rig
Single flight auger: 0 - 39 ft

Water encountered during drilling
Delayed water reading

WC = Water Content (%)  N = SPT Blow Count
PL = Plastic Limit     ** = Blow Counts During Seating
LL = Liquid Limit
PI = Plasticity Index  -200 = % Passing #200 Sieve
PP = Pocket Penetrometer (tsf)  DD = Dry Density (pcf)

Arias Geoprofessionals  Job No.: 2019-1083
### Boring Log No. B-3 (continued)

**Project:** Adams Hill Elementary School  
New Canopies and Building Addition  
9627 Adams Hill Dr, San Antonio, TX 78245,  

**Sampling Date:** 1/20/20  
**Coordinates:** N29°24'35.5" W98°40'20.6"  
**Backfill:** Cuttings

**Location:** Canopies: See Boring Location Plan

<table>
<thead>
<tr>
<th>Soil Description</th>
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<th>SN</th>
<th>WC</th>
<th>PL</th>
<th>LL</th>
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<th>-200</th>
<th>DD</th>
<th>Uc</th>
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<tbody>
<tr>
<td><strong>LEAN CLAY (CL), very hard, tan (continued)</strong></td>
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<td>T</td>
<td>18</td>
<td>16</td>
<td>47</td>
<td>31</td>
<td>3.5</td>
<td>91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STRATUM I CONTINUED</strong></td>
<td>40</td>
<td>SS</td>
<td>16</td>
<td><strong>50/5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- bluish gray from 36'-39'

Borehole terminated at 40 feet

---

**Groundwater Data:**  
First encountered during drilling: 33-ft depth  
After 20 minutes: 29.6-ft depth (37.2-ft open borehole depth)

**Field Drilling Data:**  
Coordinates: Hand-held GPS Unit  
Logged By: R. Arizola  
Driller: Eagle Drilling, Inc.  
Equipment: Truck-mounted drill rig  
Single flight auger: 0 - 39 ft

**Nomenclature Used on Boring Log**  
- Split Spoon (SS)  
- Thin-walled tube (T)  
- Water encountered during drilling  
- Delayed water reading  
- WC = Water Content (%)  
- N = SPT Blow Count  
- PL = Plastic Limit  
- ** = Blow counts during seating  
- LL = Liquid Limit  
- PI = Plasticity Index  
- PP = Pocket Penetrometer (tsf)  
- DD = Dry Density (pcf)  
- Uc = Compressive Strength (tsf)
# Boring Log No. B-4

**Project:** Adams Hill Elementary School  
**New Canopies and Building Addition**  
9627 Adams Hill Dr, San Antonio, TX 78245,  

**Location:** Pavement: See Boring Location Plan  

- **Sampling Date:** 1/20/20  
- **Coordinates:** N29°24'35.8" W98°40'20.6"  
- **Backfill:** Cuttings  

## Soil Description

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Soil Description</th>
<th>SN</th>
<th>WC (%)</th>
<th>PL</th>
<th>LL (%)</th>
<th>PI</th>
<th>PP</th>
<th>N</th>
<th>-200</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Pavement: 2&quot; Asphalt over 6&quot; Base</td>
<td>T</td>
<td>30</td>
<td>23</td>
<td>74</td>
<td>51</td>
<td>4.25</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>FAT CLAY (CH), stiff, dark brown, with gypsum crystals</td>
<td>SS</td>
<td>31</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>T</td>
<td>29</td>
<td>29</td>
<td>70</td>
<td>50</td>
<td>10</td>
<td>71</td>
<td></td>
</tr>
</tbody>
</table>

**Borehole terminated at 10 feet**

---

**Groundwater Data:**  
During drilling: Not encountered

**Field Drilling Data:**  
- Coordinates: Hand-held GPS Unit  
- Logged By: R. Arizola  
- Driller: Eagle Drilling, Inc.  
- Equipment: Truck-mounted drill rig  
- Single flight auger: 0 - 10 ft

**Nomenclature Used on Boring Log**

- Thin-walled tube (T)  
- Split Spoon (SS)

**Laboratory Test Data:**  
- WC = Water Content (%)  
- PL = Plastic Limit  
- LL = Liquid Limit  
- PI = Plasticity Index  
- PP = Pocket Penetrometer (tsf)

- N = SPT Blow Count  
- -200 = % Passing #200 Sieve

---

Arias Geoprofessionals  
Job No.: 2019-1083
# Key to Terms and Symbols Used on Boring Logs

## Coarse-Grained Soils

### Gravels
- **GW**: Well-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
- **GP**: Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
- **GM**: Silty Gravels, Gravel-Sand-Silt Mixtures
- **GC**: Clay Gravels, Gravel-Sand-Clay Mixtures
- **SW**: Well-Graded Sands, Gravelly Sands, Little or no Fines
- **SP**: Poorly-Graded Sands, Gravelly Sands, Little or no Fines
- **SM**: Silty Sands, Sand-Silt Mixtures
- **SC**: Clayey Sands, Sand-Clay Mixtures

## Fine-Grained Soils

### Silts & Clays
- **ML**: Inorganic Silts & Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
- **CL**: Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
- **MH**: Inorganic Silts, Micaeous or Diatomaceous Fine Sand or Silty Soils, Elastic Silts
- **CH**: Inorganic Clays of High Plasticity, Fat Clays

## Formational Materials

### Sandstone
- Massive Sandstones, Sandstones with Gravel Clasts

### Marlstone
- Indurated Argillaceous Limestones

### Limestone
- Massive or Weakly Bedded Limestones

### Claystone
- Mudstone or Massive Claystones

### Chalk
- Massive or Poorly Bedded Chalk Deposits

### Marine Clays
- Cretaceous Clay Deposits

## Groundwater
- Indicates Final Observed Groundwater Level
- Indicates Initial Observed Groundwater Location

### Density of Granular Soils

<table>
<thead>
<tr>
<th>Number of Blows per ft., N</th>
<th>Relative Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>Very Loose</td>
</tr>
<tr>
<td>4 - 10</td>
<td>Loose</td>
</tr>
<tr>
<td>10 - 30</td>
<td>Medium</td>
</tr>
<tr>
<td>30 - 50</td>
<td>Dense</td>
</tr>
<tr>
<td>Over 50</td>
<td>Very Dense</td>
</tr>
</tbody>
</table>

### Consistency and Strength of Cohesive Soils

<table>
<thead>
<tr>
<th>Number of Blows per ft., N</th>
<th>Consistency</th>
<th>Unconfined Compressive Strength, q, (tsf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 2</td>
<td>Very Soft</td>
<td>Less than 0.25</td>
</tr>
<tr>
<td>2 - 4</td>
<td>Soft</td>
<td>0.25 - 0.5</td>
</tr>
<tr>
<td>4 - 8</td>
<td>Medium (Firm)</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>8 - 15</td>
<td>Stiff</td>
<td>1.0 - 2.0</td>
</tr>
<tr>
<td>15 - 30</td>
<td>Very Stiff</td>
<td>2.0 - 4.0</td>
</tr>
<tr>
<td>Over 30</td>
<td>Hard</td>
<td>Over 4.0</td>
</tr>
</tbody>
</table>

---

Arias Geoprofessionals
### KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

#### TABLE 1 Soil Classification Chart (ASTM D 2487-11)

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Criteria of Assigning Group Symbols and Group Names Using Laboratory Tests</th>
<th>Group Symbol</th>
<th>Group Name&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COARSE-GRAINED SOILS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravels</td>
<td>Clean Gravels</td>
<td>Cu ≥ 4 and 1 ≤ Cc ≤ 3</td>
<td>GW</td>
</tr>
<tr>
<td>(More than 50% of coarse fraction retained on No. 4 sieve)</td>
<td></td>
<td>Cu &lt; 4 and/or [Cc &lt; 1 or Cc &gt; 3]</td>
<td>GP</td>
</tr>
<tr>
<td>Gravels with Fines</td>
<td>Fines classify as ML or MH</td>
<td>GM</td>
<td>Silty Gravel&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(More than 12% fines&lt;sup&gt;c&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 50% retained on No. 200 sieve</td>
<td>Fines classify as CL or CH</td>
<td>GC</td>
<td>Clayey Gravel&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sands</td>
<td>Clean Sands</td>
<td>Cu ≥ 6 and 1 ≤ Cc ≤ 3</td>
<td>SW</td>
</tr>
<tr>
<td>(50% or more of coarse fraction passes No. 4 sieve)</td>
<td></td>
<td>Cu &lt; 6 and/or [Cc &lt; 1 or Cc &gt; 3]</td>
<td>SP</td>
</tr>
<tr>
<td>Sands with Fines</td>
<td>Fines classify as ML or MH</td>
<td>SM</td>
<td>Silty Sand&lt;sup&gt;GL&lt;/sup&gt;</td>
</tr>
<tr>
<td>(More than 12% fines&lt;sup&gt;e&lt;/sup&gt;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FINE-GRAINED SOILS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silts and Clays</td>
<td>inorganic</td>
<td>CL</td>
<td>Lean Clay&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td>Liquid limit less than 50</td>
<td></td>
<td>ML</td>
<td>Silt&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td>organic</td>
<td>Liquid limit - oven dried &lt;0.75</td>
<td>OL</td>
<td>Organic Clay&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Liquid limit - not dried</td>
<td>Organic Silt&lt;sup&gt;KL&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Silts and Clays</td>
<td>inorganic</td>
<td>CH</td>
<td>Fat Clay&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td>(50% or more passes the No. 200 sieve)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid limit 50 or more</td>
<td></td>
<td>MH</td>
<td>Elastic Silt&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td>organic</td>
<td>Liquid limit - oven dried &lt;0.75</td>
<td>OH</td>
<td>Organic Clay&lt;sup&gt;KL&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Liquid limit - not dried</td>
<td>Organic Silt&lt;sup&gt;KL&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td><strong>HIGHLY ORGANIC SOILS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primarily organic matter, dark in color, and organic odor</td>
<td>PT</td>
<td>Peat</td>
<td></td>
</tr>
</tbody>
</table>

#### TERMINOLOGY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulders</td>
<td>Over 12-inches (300mm)</td>
</tr>
<tr>
<td>Cobble</td>
<td>12-inches to 3-inches (300mm to 75mm)</td>
</tr>
<tr>
<td>Gravel</td>
<td>3-inches to No. 4 sieve (75mm to 4.75mm)</td>
</tr>
<tr>
<td>Sand</td>
<td>No. 4 sieve to No. 200 sieve (4.75mm to 0.075mm)</td>
</tr>
<tr>
<td>Silt or Clay</td>
<td>Passing No. 200 sieve (0.075mm)</td>
</tr>
<tr>
<td>Calcereous</td>
<td>Containing appreciable quantities of calcium carbonate, generally nodular</td>
</tr>
<tr>
<td>Stratified</td>
<td>Alternating layers of varying material or color with layers at least 6mm thick</td>
</tr>
<tr>
<td>Laminated</td>
<td>Alternating layers of varying material or color with the layers less than 6mm thick</td>
</tr>
<tr>
<td>Fissured</td>
<td>Fracture planes appear polished or glossy sometimes striated</td>
</tr>
<tr>
<td>Slickensided</td>
<td>Fracture planes appear polished or glossy sometimes striated</td>
</tr>
<tr>
<td>Blocky</td>
<td>Cohesive soil that can be broken down into small angular lumps which resist further breakdown</td>
</tr>
<tr>
<td>Lensed</td>
<td>Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay</td>
</tr>
<tr>
<td>Homogeneous</td>
<td>Same color and appearance throughout</td>
</tr>
</tbody>
</table>

<sup>a</sup> More than 50% retained on No. 200 sieve

<sup>b</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name

<sup>c</sup> Gravel with 5% to 12% fines require dual symbols:
- GW-GM well-graded gravel with silt
- GW-GC well-graded gravel with clay
- GP-GM poorly-graded gravel with silt
- GP-GC poorly-graded gravel with clay

<sup>d</sup> Cu = \( \frac{D_{60}}{D_{10}} \)

<sup>e</sup> Cu ≥ 4 and 1 ≤ Cc ≤ 3

<sup>f</sup> Cu < 4 and/or [Cc < 1 or Cc > 3]

<sup>g</sup> Cu ≥ 6 and 1 ≤ Cc ≤ 3

<sup>h</sup> Cu < 6 and/or [Cc < 1 or Cc > 3]

<sup>i</sup> Cu ≥ 4 and 1 ≤ Cc ≤ 3

<sup>j</sup> Cu < 4 and/or [Cc < 1 or Cc > 3]

<sup>k</sup> Cu ≥ 6 and 1 ≤ Cc ≤ 3

<sup>l</sup> Cu < 6 and/or [Cc < 1 or Cc > 3]

<sup>m</sup> Cu ≥ 6 and 1 ≤ Cc ≤ 3

<sup>n</sup> Cu < 6 and/or [Cc < 1 or Cc > 3]

<sup{o}</sup> Fines classify as CL or CH

<sup>p</sup> Fines classify as ML or MH

<sup>q</sup> Fines classify as CL or CH

<sup>r</sup> Fines classify as ML or MH

<sup>s</sup> Fines classify as CL or CH

<sup>t</sup> Fines classify as ML or MH

<sup>u</sup> Fines classify as CL or CH

<sup>v</sup> Fines classify as ML or MH

<sup>w</sup> Fines classify as CL or CH

<sup>x</sup> Fines classify as ML or MH

<sup>y</sup> Fines classify as CL or CH

<sup>z</sup> Fines classify as ML or MH
### Key to Terms and Symbols Used on Boring Logs

#### Hardness Classification of Intact Rock

<table>
<thead>
<tr>
<th>Class</th>
<th>Hardness</th>
<th>Field Test</th>
<th>Approximate Range of Uniaxial Compression Strength kg/cm² (tons/ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Extremely hard</td>
<td>Many blows with geologic hammer required to break intact specimen.</td>
<td>&gt; 2,000</td>
</tr>
<tr>
<td>II</td>
<td>Very hard</td>
<td>Hand held specimen breaks with hammer end of pick under more than one blow.</td>
<td>2,000 – 1,000</td>
</tr>
<tr>
<td>III</td>
<td>Hard</td>
<td>Cannot be scraped or peeled with knife, hand held specimen can be broken with single moderate blow with pick.</td>
<td>1,000 – 500</td>
</tr>
<tr>
<td>IV</td>
<td>Soft</td>
<td>Can just be scraped or peeled with knife. Indentations 1mm to 3mm show in specimen with moderate blow with pick.</td>
<td>500 – 250</td>
</tr>
<tr>
<td>V</td>
<td>Very soft</td>
<td>Material crumbles under moderate blow with sharp end of pick and can be peeled with a knife, but is too hard to hand-trim for triaxial test specimen.</td>
<td>250 – 10</td>
</tr>
</tbody>
</table>

#### Rock Weathering Classifications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Symbol</th>
<th>Diagnostic Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh</td>
<td>F</td>
<td>No visible sign of Decomposition or discoloration. Rings under hammer impact.</td>
</tr>
<tr>
<td>Slightly Weathered</td>
<td>WS</td>
<td>Slight discoloration inwards from open fractures, otherwise similar to F.</td>
</tr>
<tr>
<td>Moderately Weathered</td>
<td>WM</td>
<td>Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock, but cores cannot be broken by hand or scraped by knife. Texture preserved.</td>
</tr>
<tr>
<td>Highly Weathered</td>
<td>WH</td>
<td>Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct, but fabric preserved.</td>
</tr>
<tr>
<td>Completely Weathered</td>
<td>WC</td>
<td>Minerals decomposed to soil, but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.</td>
</tr>
</tbody>
</table>

#### Rock Discontinuity Spacing

<table>
<thead>
<tr>
<th>Description for Structural Features: Bedding, Foliation, or Flow Banding</th>
<th>Spacing</th>
<th>Description for Joints, Faults or Other Fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very thickly (bedded, foliated, or banded)</td>
<td>More than 6 feet</td>
<td>Very widely (fractured or jointed)</td>
</tr>
<tr>
<td>Thickly</td>
<td>2 – 6 feet</td>
<td>Widely</td>
</tr>
<tr>
<td>Medium</td>
<td>8 – 24 inches</td>
<td>Medium</td>
</tr>
<tr>
<td>Thinnly</td>
<td>2 ½ – 8 inches</td>
<td>Closely</td>
</tr>
<tr>
<td>Very thinly</td>
<td>¼ – 2 ½ inches</td>
<td>Very closely</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description for Micro-Structural Features: Lamination, Foliation, or Cleavage</th>
<th>Spacing</th>
<th>Descriptions for Joints, Faults, or Other Fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensely (laminated, foliated, or cleaved)</td>
<td>¼ – ½ inch</td>
<td>Extremely close</td>
</tr>
<tr>
<td>Very intensely</td>
<td>Less than ¼ inch</td>
<td></td>
</tr>
</tbody>
</table>

### Engineering Classification for In Situ Rock Quality

<table>
<thead>
<tr>
<th>RQD %</th>
<th>Velocity Index</th>
<th>Rock Mass Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 – 100</td>
<td>0.80 – 1.00</td>
<td>Excellent</td>
</tr>
<tr>
<td>75 – 90</td>
<td>0.60 – 0.80</td>
<td>Good</td>
</tr>
<tr>
<td>50 – 75</td>
<td>0.40 – 0.60</td>
<td>Fair</td>
</tr>
<tr>
<td>25 – 50</td>
<td>0.20 – 0.40</td>
<td>Poor</td>
</tr>
<tr>
<td>0 – 25</td>
<td>0 – 0.20</td>
<td>Very Poor</td>
</tr>
</tbody>
</table>
APPENDIX C: LABORATORY AND FIELD TEST PROCEDURES
FIELD AND LABORATORY EXPLORATION

The field exploration program included drilling at selected locations within the site and intermittently sampling the encountered materials. The boreholes were drilled using single flight augers (ASTM D 1452). Samples of encountered materials were obtained using a split-barrel sampler while performing the Standard Penetration Test (ASTM D 1586) and with a thin walled Shelby Tube Sampler (ASTM D 1587). The sample depth interval and type of sampler used is included on the soil boring log. Arias’ field representative visually logged each recovered sample and placed a portion of the recovered sampled into a plastic bag for transport to our laboratory.

SPT N values and blow counts for those intervals where the sampler could not be advanced for the required 18-inch penetration are shown on the soil boring log. If the test was terminated during the 6-inch seating interval or after 10 hammer blows were applied used and no advancement of the sampler was noted, the log denotes this condition as blow count during seating penetration. Penetrometer readings recorded for thin-walled tube samples that remained intact also are shown on the soil boring logs.

Arias performed soil mechanics laboratory tests on selected samples to aid in soil classification and to determine engineering properties. Tests commonly used in geotechnical exploration, the method used to perform the test, and the designation on the boring log where data are reported are summarized as follows:

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test Method</th>
<th>Log Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (moisture) content of soil and rock by mass</td>
<td>ASTM D 2216</td>
<td>WC</td>
</tr>
<tr>
<td>Liquid limit, plastic limit, and plasticity index of soils</td>
<td>ASTM D 4318</td>
<td>PL, LL, PI</td>
</tr>
<tr>
<td>Amount of material in soils finer than the No. 200 sieve</td>
<td>ASTM D 1140</td>
<td>-200</td>
</tr>
<tr>
<td>Unconfined compressive strength of cohesive soil</td>
<td>ASTM D 2166</td>
<td>Uc</td>
</tr>
</tbody>
</table>

The laboratory results are reported on the soil boring logs listed in Appendix B.
APPENDIX D:  GBA INFORMATION – GEOTECHNICAL REPORT
The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects
Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared solely for the client. Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.

Read this Report in Full
Costly problems have occurred because those relying on a geotechnical-engineering report did not read it in its entirety. Do not rely on an executive summary. Do not read selected elements only. Read this report in full.

You Need to Inform Your Geotechnical Engineer about Change
Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:
• the client's goals, objectives, budget, schedule, and risk-management preferences;
• the general nature of the structure involved, its size, configuration, and performance criteria;
• the structure's location and orientation on the site; and
• other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:
• the site's size or shape;
• the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
• the elevation, configuration, location, orientation, or weight of the proposed structure;
• the composition of the design team; or
• project ownership.

As a general rule, always inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

This Report May Not Be Reliable
Do not rely on this report if your geotechnical engineer prepared it:
• for a different client;
• for a different project;
• for a different site (that may or may not include all or a portion of the original site); or
• before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be, and, in general, if you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the “Findings” Related in This Report Are Professional Opinions
Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.
This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals’ plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you’ve included the material for informational purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer’s services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.

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APPENDIX E: PROJECT QUALITY ASSURANCE
A Message to Owners from ASFE/GBA

Construction-materials engineering and testing (CoMET) consultants perform quality-assurance (QA) services to evaluate how well constructors are achieving the specified conditions they’re contractually obligated to achieve. Done right, QA can save you time and money while helping you manage project risks by detecting molehills before they grow into mountains you and the design team are forced to climb.

Done right, QA can save you time and money; prevent claims and disputes; and reduce risks. Many owners don’t do QA right because they follow bad advice.

It’s ironic that, as important as CoMET consultants can be, some owners and design professionals treat them as though they were commodities. Often referred to incorrectly as “testing labs,” CoMET consultants create the last line of defense against costly construction errors and the delays, change orders, claims, disputes, and litigation that can result. Why would owners entrust such an important responsibility to the firm offering to fulfill it for the lowest fee as opposed to the one whose qualifications enable it to offer the best service and the most value? The answer: Too many owners follow bad advice; e.g., “CoMET consultants are all the same. They all follow the same standards. They all have accredited laboratories and certified personnel. Go with the low bidder.” That’s bad advice because there’s no such thing as a standard QA scope of service, meaning that – to bid – each interested firm must develop its own scope…and it has to be a cheap scope in order to offer the low fee the owner apparently prefers. A cheap scope cannot help but jeopardize service quality, aggravating risk for you and the entire project team. Of course, some firms will offer what seems to be a better scope at a “low-ball,” less-than-cost bid in order to win the commission and then earn a profit through multiple change orders.

You have too much at stake to follow bad advice. Consider these facts.

Fact: Most CoMET firms are not accredited, including some that say they are and some that don’t even follow the correct standards, even when they say they do. And the quality of those that are accredited varies significantly; some practice at a high level; others just barely scrape by. As such, while accreditation is extremely important, it is far from being a “be-all and end-all.” It signifies only that a firm’s facilities or operations met the minimum criteria of an accrediting body whose concerns in some cases may have little to do with your project. And the condition of what an accrediting body typically evaluates – management systems, technical staff, facilities, and equipment – can change substantially between on-site accreditation assessments.
Most CoMET firms are not accredited and it’s dangerous to assume CoMET personnel are certified.

Fact: *It’s dangerous to assume CoMET personnel are certified.* Many have no credentials; some are certified by organizations of questionable merit, while others have a valid certification, but *not* for the services they’re assigned. All too many have little training or none at all.

Some CoMET firms – the “low-cost providers” – *want* you to believe that price is the only difference between QA providers. It’s not: Firms that sell low price typically lack:
- facilities appropriate for many of the projects they accept,
- equipment that is well maintained and properly calibrated,
- field and laboratory personnel who are well trained and appreciate the importance of their responsibilities,
- management with the education, experience, and judgment to provide technical oversight, and
- the professional-liability insurance you should require to enjoy peace of mind.

Quality-oriented firms invest in the facilities, equipment, personnel, and insurance needed to achieve quality in quality assurance.

To derive maximum value, have the CoMET project manager serve actively on the project team from beginning to end.

CoMET consultants’ construction-phase QA services focus on two distinct issues:
- those that relate to geotechnical engineering and
- those that relate to the other elements of construction.

Geotechnical-engineering issues are critically important because they are essential to the “observational method” geotechnical engineers use to help their clients save time and money while maintaining a “healthy respect” for the unknown in the underground.

In essence, the observational method is an overall approach that begins during the earliest element of the design phase and carries through
to the construction phase. Geotechnical engineers initiate this approach by applying their knowledge of local geological conditions to develop an economical subsurface-sampling plan. Proper execution of the plan should derive just enough samples from just enough areas to permit an experienced geotechnical engineer to develop an assumed-subsurface profile. Because so much depends on the reliability of each sample, quality-focused geotechnical engineers often insist that their own personnel perform or oversee the sampling process, from obtaining the samples to packaging, storing, and transporting them to a trusted laboratory, using their own equipment and facilities or relying on others’ they know they can trust.

Combining the assumed subsurface profile with knowledge of what is being constructed – e.g., its dimensions, weight, anticipated use, and performance objectives – geotechnical engineers develop provisional recommendations for the structure’s foundations and for the specifications of various “geo” elements, like excavations, site grading, foundation-bearing grades, and roadway and parking-lot preparation and surfacing. When geotechnical engineers know that their personnel will be on site observing subsurface conditions as they are exposed, they usually will recommend the most cost-effective design their assumptions make practical, knowing that – if their assumed-subsurface profile is “off” in any significant way – the variances will be caught (that’s what they teach their field personnel to do), permitting them to “tweak” their recommendations in the field. It is essential to realize that geotechnical engineers cannot finalize their recommendations until they are on site to verify that the subsurface conditions they predicted are those that actually exist.

Geotechnical engineers cannot finalize their recommendations until they are on site to verify that the subsurface conditions they predicted are those that actually exist.

Entrusting geotechnical field observation to someone other than the geotechnical engineer of record creates a significant risk.

Insofar as other elements of construction are concerned, many geotechnical-engineering firms have obliged their clients by expanding their field-services mix, so they’re able to perform overall construction QA, encompassing – in addition to geotechnical issues – reinforced concrete, structural steel, structural masonry, fireproofing, and so on. Unfortunately, that’s caused some confusion. Believing that all CoMET consultants are alike, some owners take bids for the overall CoMET package, including the geotechnical field observation, thus curtailing services of the geotechnical engineer of record (GER).

Entrusting geotechnical field observation to someone other than the GER creates a significant risk.

GERs have developed a variety of protocols to optimize the quality of their field-observation procedures. Quality-focused GERs meet with their field representatives before the representatives leave for a project site, to brief them on what to look for and where, when, and how to look. (No one can duplicate this briefing, because no one else knows as much about a project’s geotechnical issues.) And once they arrive at a project site, the field representatives know to maintain timely, effective communication with the GER, because that’s what the GER has trained them to do. By contrast, it’s extremely rare for a different
Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish, helping to explain why “geo” issues are the number-one source of construction-industry claims and disputes.

To derive the biggest bang for the QA buck, identify three or even four quality-focused CoMET consultants. (If you don’t know any, use the “Find a Geoprofessional” service available free at www.asfe.org.) Ask about the firms’ ongoing and recent projects and the clients and client representatives involved; insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.

Insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.

Once you identify the two or three most qualified firms, meet with their key personnel, preferably at their own facility, so you can inspect their laboratory, speak with management and technical staff, and form an opinion about the firm’s capabilities and attitude.

Insist that each firm’s designated project manager and lead field representative participate in the meeting. You will benefit when those individuals are seasoned QA professionals familiar with construction’s rough-and-tumble. Ask about others the firm will assign, too. There’s no substitute for experienced, certified personnel who are familiar with the codes and standards involved and know how to:

• read and interpret plans and specifications;
• perform the necessary observation, inspection, and testing;
• document their observations and findings;
• interact with constructors’ personnel; and
• respond to the unexpected.

Important: Many of the services CoMET QA field representatives perform – like observing operations and outcomes – require the good judgment afforded by extensive training and experience. Who will be on hand when the unexpected occurs: a 15-year “veteran” or a rookie?

Many of the services CoMET QA field representatives perform require good judgment.

Also consider the tools CoMET personnel use. Some firms are fanatical about proper maintenance and calibration; others, less so. Ask to see the firm’s calibration records. If the firm doesn’t have any, or if they are not current, be cautious: You cannot trust test results derived using equipment that may be out of calibration.

Also ask if the firm’s laboratory participates in
proficiency testing, relying on a program like the one sponsored by the American Association of State Highway and Transportation Officials (AASHTO). And be sure to ask a firm’s representatives about their reporting practices, including report distribution and timeliness, how they handle notifications of nonconformance, and how they resolve complaints.

Once you identify your preferred firm, meet with its representatives again. Provide the approved plans and specifications and other pertinent materials, like a construction schedule, and discuss what’s needed to finalize a scope of service that reflects what will be happening on site and when it will occur. Recognize that most CoMET services are performed periodically or randomly, not continuously. Also recognize that a CoMET consultant’s field representatives cannot be in all places at all times, an important issue when multiple activities are ongoing simultaneously. Ask for guidance about appropriate staffing levels and discuss the trade-offs that may be available.

Creating a detailed scope of CoMET QA service can help avoid surprises. Still, scope flexibility is needed to deal promptly with the unanticipated, like the additional services required to check the rework performed because of an error caught in QA.

**Scope flexibility is needed to deal promptly with the unanticipated.**

For financing purposes, some owners require the constructor to pay for CoMET services. Consider an alternative approach so you don’t convert the constructor into the CoMET consultant’s client. If it’s essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. This arrangement ensures that you remain the CoMET consultant’s client, and it prevents the CoMET fee from becoming part of the constructor’s bid-price competition. (Note that the International Building Code (IBC) requires the owner to pay for Special Inspection (SI) services commonly performed by the CoMET consultant as a service separate from QA, to help ensure the independence of the SI process. Because failure to comply could result in denial of an occupancy or use permit, having a contractual agreement that conforms to local code requirements is essential.)

**If it’s essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents.**

**Note, too, that the International Building Code (IBC) requires you to pay for Special Inspection (SI) services.**

CoMET consultants can usually quote their fees as unit fees, unit fees with estimated total (invoiced on a unit-fee basis), or lump-sum (invoiced on a percent-completion basis referenced to a schedule of values). No matter which method is used, estimated quantities need to be realistic. Some CoMET firms lower their total-fee estimates by using quantities they know are too low and then request change orders long before construction and the need for QA are complete.

Once you and the CoMET consultant settle on the scope of service and fee, enter into a written contract. Established CoMET firms have their own contracts; most owners sign them. Some owners prefer to use different contracts, but that can be a mistake when the contract was prepared for construction services. Professional services are different. Wholly avoidable problems occur when a contract includes provisions that don’t apply to the services involved and fails to include those that do.
Some owners create wholly avoidable problems by using a contract prepared for construction services.

This final note: CoMET consultants perform QA for owners, not constructors. While constructors are commonly given review copies of QA reports as a courtesy, you need to make it clear that constructors do not have a legal right to rely on those reports; i.e., if constructors want to forgo their own observation and testing and rely on results derived from a scope created to meet only the needs of the owner, they must do so at their own risk. In all too many cases where owners have failed to make that clear, constructors have alleged that they did have a legal right to rely on QA reports and, as a result, the CoMET consultant – not they – are responsible for their failure to deliver what they contractually promised to provide. The outcome can be delays and disputes that entangle you and all other principal project participants. Avoid that. Rely on CoMET professionals with the resources and attitude needed to manage this and other risks as an element of a quality-focused service. Involve them early. Keep them engaged. And listen to what they say. Good CoMET consultants can provide great value.

For more information, speak with representatives of a firm that’s part of ASFE/The Geoprofessional Business Association (GBA) or contact GBA staff. In either case, your inquiries will be warmly welcomed.
PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work includes the Administrative Upgrades at Adams Hill Elementary School. The Work covered by the Contract Documents includes a demolition/renovation and addition of the administrative area and exterior canopy, and all items incidental thereto with items of equipment, specialties, site work, mechanical and electrical work and systems as described by the Contract Documents.

B. The Contractor shall supply all utilities, labor, materials, transportation, apparatus, light, scaffolding, and tools necessary for the entire proper execution and completion of the work. Install, maintain and remove all equipment of construction and other utensils or things, and be responsible for the safe, proper and lawful maintenance and use of same. Construct in the best and most workmanlike manner the complete project and everything properly incidental thereto as shown on the Drawings, stated in the Specifications or reasonably implied there from, and in accordance with the Contract Documents. This Contract includes Site, Mechanical, Plumbing and Electrical Work.

C. Contractor shall be responsible for securing and paying for all permits, fees and licenses required for the proper execution and completion of the Work except as otherwise noted. Refer to the NISD Owner’s Special Conditions for requirements for permits, licenses, certificates, and fees.
   1. Building permit, tree preservation, and utility impact fees (if applicable) shall be paid by the Owner.

D. Contractor shall coordinate, provide and install knox box and padlocks at locations required by the Authority having jurisdiction.

E. Give required notices.

F. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the work.

G. Enforce strict discipline and good order among employees. Do not employ on the Work persons who are unfit or unskilled in assigned task.

H. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, 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 to be provided by said officer setting forth the provisions of this nondiscrimination clause.
1.2 CONSTRUCTION SCHEDULING

A. Coordinate scheduling of the Project around the following:
   1. Except as otherwise permitted by the Owner, Contractor shall begin Work at the site not earlier than June 8, 2020.
   2. Work related to coordination with Owner’s removal of asbestos-containing materials shall occur starting on June 8, 2020 with Contractor’s removal of exterior brick and continue for approximately two weeks.
      a. At exterior walls where gypsum sheathing board is removed by Others as part of asbestos abatement, Contractor shall promptly replace sheathing board in order to protect the building from water intrusion.
   3. Refer to PHASING SCHEDULE indicated on Drawings which identifies specific phase of work that must be complete or operational prior to the start of school on August 24, 2020.
      a. Work associated with relocating IDF equipment and cabling shall be completed and operational prior to August 24, 2020.
      b. Existing opening at Door XA101 shall be demolished and replaced with new door, frame and hardware prior to August 24, 2020.
   4. Substantial Completion date for the Project, ready for occupancy, shall be not later than December 28, 2020.

B. Construction Schedule will include five (5) days for the District to conduct the State of Texas Assessments of Academics (STAAR) testing for 2020-2021 school year. Dates are tentatively scheduled for December 8th, 10th, and 11th, 2020; to be confirmed at a later date.
   1. No construction activities whatsoever will be allowed on-site on these days between the hours of 8 am and 5 pm.

1.3 COORDINATION WITH OTHERS

A. Contractor acknowledges that Owner reserves the right to engage other contractors, engineers, inspectors, consultants and/or its own personnel to provide work or services relating to the Project, which may be carried out concurrently with Contractors Work. Contractor shall fully cooperate by coordinating its Work with any work or services being performed by Owner and Owners other contractors, engineers, inspectors and consultants as follows:
   1. Asbestos Abatement: Where determined in the Owner’s Asbestos Survey, coordinate removal of exterior walls, interior walls and ceilings to facilitate access for removal of identified asbestos containing material by Others.

B. Construct Work under a single lump sum contract using the competitive sealed proposal delivery method where the District requests proposals and pricing information based on the scope of work provided, ranks the offerors, and awards the project to the Contractor that offers the best value and most advantageous proposal.

1.4 CONFERENCES

A. Preconstruction Conference: Before any work is started, the Contractor and Subcontractors shall meet with the Architect and the Owner to discuss the methods or procedures to be followed by the Contractor. The Contractor shall comply with the Northside Independent School District Owner’s Special Conditions included as part of the Project Manual.

B. The Owner will schedule Progress Meetings in accordance with the N.I.S.D. Owner’s Special Conditions to review project status and to allow for coordination of upcoming work. In addition, the Contractor shall convene pre-installation conferences at the work site prior to commencing the specific work items as described in Section 01 30 00. Management and labor foremen representatives for each involved trade shall be present and participate in
these meetings. The Contractor shall notify the Architect and Owner of these meetings as indicated in Section 01 30 00.

1.5 WORK PROCEDURES

A. Surrounding Site Conditions: Prior to commencement of the work, the Contractor and the Architect shall jointly survey those improvements immediately adjacent to the Project, making permanent note and record of such existing damage as cracks, sags, or other similar damage. This record shall serve as basis for determination of subsequent damage due to the Contractor's operations. Such damage as noted shall be suitably recorded and the official record of existing damage shall be signed by all parties making the survey. Any cracks, sags, or damage of any nature to the adjacent improvements, not noted in the original survey but subsequently observed, shall be reported immediately to the Architect.

B. Time is the Essence of the Contract: The use of insufficient labor or equipment for construction purposes or inadequate scheduling of materials or equipment to be installed will not be allowed as cause for delay. Labor, materials, and equipment shall be scheduled to the site in such quantities as required for the uninterrupted progress of the work and the least obstruction of premises.

C. Measurements: Before ordering any material or doing any work, the Contractor shall verify all measurements at the building and be responsible for the correctness of same. No exchange or compensation will be allowed on account of difference between actual dimensions and the measurements indicated in the Drawings. Differences which may be found shall be submitted to the Architect for instruction before proceeding with the work.

1.6 PROTECTION

A. Protect Finish Work: Cover and protect finished floors, steps, treads, etc., against damage by workmen, equipment, etc., during the work. Wherever concrete, paint, cement, roofing, equipment, etc., are hoisted or carried into or onto the building, the walls, aluminum work, windows, etc., adjacent to the hoisting must be covered with heavy layer of building paper, the floors and steps over which any of the material is carried must be well covered to protect all the work against damage.

1.7 DISPOSITION OF UTILITIES

A. Rules and regulations governing the respective utilities shall be observed in executing all work under this Contract.

B. Active utilities shall be adequately protected from damage during construction. Where active utilities or other improvements are encountered but are not shown on the drawings, the Architect shall be advised; the work shall be adequately protected, supported, or relocated as directed by the Architect.

C. Conform to requirements of Special Conditions.

1.8 PROTECTION OF SITE IMPROVEMENTS

A. Do not permit the accumulation of surface or subsurface water in ditches or elsewhere on the premises. Control and dispose of such conditions by means of temporary pumps, drainage lines, dams, or other methods.
PART 2 - PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION
SECTION 01 21 00
ALLOWANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Cash allowances.
   B. Contingency allowance.

1.2 RELATED SECTIONS
   A. Section 01 26 00 - Contract Coordination.

1.3 CASH ALLOWANCES
   A. General: Refer to the "Schedule of Allowances", indicated below for amounts included in Contract Sum. Coordinate Allowance Work with related Work, to ensure that each selection is completely integrated and interfaced with related Work. Requirements for the Work of Allowances are shown and specified, to extent established by date of Contract Documents; additional requirements are established by change order. At earliest possible date, advise Architect of date each final Allowance selection must be completed. Submit proposals for Allowance Work as directed, and in the manner specified for change orders. The Contractor shall include in the Base Bid the Allowances indicated in the Schedule of Allowances. Also to be included in the Base Bid are all costs in connection with the Allowance Sum stated in the Schedule, including supervision, overhead, profit and insurance, thus leaving the entire Allowance amount available for the purchase and installation of the particular item. Any unused portion of the Allowance will be deducted from the final payment. Where requested, furnish detailed breakdown of quantity survey from both the Contractor and all pertinent subcontractors. The detailed breakdown shall be sufficient detail so as to be satisfactory to the Architect/Engineer. Deliver excess materials of Allowance Work to Owner's storage space, or dispose of by other means as directed.
   B. Contractor Responsibilities:
      1. On notification of selection by Owner, execute purchase agreement with designated supplier.
      2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
      3. Promptly inspect Products upon delivery for completeness, damage and defects. Submit claims for transportation damage.
   C. Differences in costs will be adjusted by Change Order.

1.4 SCHEDULE OF SPECIAL LUMP SUM CASH ALLOWANCES:
   A. TESTING AND BALANCING ALLOWANCE: The Contractor shall include in his bid an allowance of Fifteen Thousand Dollars ($15,000.00) for the balancing agency's services further delineated in this specification. The Contractor will solicit bids from a minimum three testing and balancing firms of which one will be selected by the Owner's Representative for employment by the Contractor at an early stage of the Contract Work. The right to provide all or part of the testing and balancing services specified herein and to deduct all or part of the allowance from the contract price is hereby reserved. Additionally, the right to select the Testing and Balancing firm rests with the Owner's Representative.
B. **BUILDING LETTERS ALLOWANCE**: Include the stipulated sum of Five Thousand Dollars ($5,000.00) for purchase and delivery of exterior building letters as specified in Section 10 14 16. Note: Installation is part of the Contract Sum/Price.

C. **UNFORESEEN CONDITIONS ALLOWANCE**: Include the stipulated sum of Twenty-five Thousand Dollars ($25,000.00) for unforeseen conditions encountered in the Work above and beyond Work covered in the Base Bid. Upon completion of the project, any unused amount which remains in this allowance shall be credited to the Owner.

D. **MISCELLANEOUS STEEL ALLOWANCE**: Allow the sum of Five Thousand Dollars ($5,000.00) in the Base Proposal for providing and erecting miscellaneous structural steel as directed by the Structural Engineer. Steel covered under the miscellaneous steel allowance shall be above and beyond steel covered in the Base Bid. Upon completion of the project, any unused amount which remains in this allowance shall be credited to the Owner.

1.5 **CONTINGENCY ALLOWANCE**

A. **CONTINGENCY ALLOWANCE**: Allow the sum of Seventy-five Thousand Dollars ($75,000.00) in the Base Proposal for general contingencies. This Allowance shall be used only as directed by the Owner by way of Change Order. At time of project closeout submit final Contingency Allowance Change Order proposal crediting the Owner with unused amount (if any) of Contingency Allowance.

**PART 2 - PRODUCTS**

Not Used.

**PART 3 - EXECUTION**

Not Used.

**END OF SECTION**
SECTION 01 23 00
ALTERNATES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED
A. Identification and description of Alternate Work.

1.2 RELATED DOCUMENTS
A. Bid Documents: Quotation of cost of each Alternate.
B. Owner-Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.
C. Sections of Specifications identified in each Alternate.
D. General Conditions of the Contract and Supplementary Conditions.

1.3 PROCEDURES
A. Definitions: Alternates are defined as alternate products, materials, equipment, installations or systems for portions of the Work, which may, at Owner's option and under terms established by the Contract Documents, be selected and recorded in the Contractor (Owner-Contractor Agreement) to either supplement or displace corresponding basic requirements of Contract Documents. Alternates may or may not substantially change scope and general character of the Work; and are not to be confused with "Allowances", "Change Orders", "Substitutions", and other similar provisions.
B. General Provisions: A "Schedule of Alternates" is included at the end of this Section. Each Alternate is defined by abbreviated language, recognizing that Drawings and Specification Sections document the requirements. Coordination of related Work is required to ensure that Work affected by each selected Alternate is complete and properly interfaced with Work of Alternates.
C. Notification: Immediately following award of Contract, prepare and distribute to each entity to be involved in performance of the Work, a notification of status of each Alternate. Indicate which Alternates have been: (1) Accepted, (2) Rejected, and (3) Deferred for consideration at a later date as indicated. Include full description of negotiated modifications to Alternates, if any.

1.4 SCHEDULE OF ALTERNATES
A. ALTERNATE BID NO. 1: Fire Alarm Voice Annunciation – In addition to all devices specified, Fire Alarm System shall be modified to include speakers for alarm notification. Fire Alarm Control Panel shall include capability for audible annunciation through recorded voice instructions. Fire alarm speakers shall be included throughout occupancy in a quantity and configuration to ensure at a minimum audibility standards are satisfied.
B. Base Bid: Fire Alarm System shall all devices as specified, including horns and strobes for alarm notification.
PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION
SECTION 01 26 00
CONTRACT COORDINATION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Coordination of Work of the Contract.

1.2 RELATED REQUIREMENTS

A. Uniform General Conditions, Supplementary General Conditions, and Special Conditions of the Contract.

B. Section 01 11 00 – Summary of Work.

C. Section 01 60 00 – Material and Equipment.

D. Section 01 73 29 – Cutting and Patching.

E. Section 01 77 00 – Project Closeout.

1.3 DESCRIPTION

A. Coordinate scheduling, submittals, and work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

1.4 MEETINGS

A. In addition to progress meetings specified elsewhere, hold coordination meetings and pre-installation conferences with personnel and subcontractors to assure coordination of Work.

1.5 COORDINATION OF SUBMITTALS

A. Schedule and coordinate submittals in accordance with procedures noted in Section 01 33 00.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

1.6 COORDINATION OF SPACE

A. Coordinate use of Project space and sequence of installation of mechanical and electrical work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
B. In finished areas conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Verify that mechanical and electrical controls, valves, cut-offs, cleanouts, switches and other items are located to be readily accessible to user.

1.7 COORDINATION OF CONTRACT CLOSEOUT

A. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion in accordance with Section 01 77 00.

B. After Owner occupancy of work areas, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

C. Assemble and coordinate closeout submittals specified in Section 01 77 00.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.
SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.
B. Field engineering.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Pre-installation meetings.
G. Special procedures.

1.2 RELATED SECTIONS

A. Section 01 73 29 – Cutting and Patching.

1.3 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.
C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 FIELD ENGINEERING

A. Employ Land Surveyor registered in State of Texas and acceptable to Architect/Engineer.
B. Locate and protect survey control and reference points. Promptly notify Architect/Engineer of discrepancies discovered.

C. Control datum for survey is that established by Owner provided survey.

D. Verify set-backs and easements; confirm drawing dimensions and elevations.

E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

F. Submit copy of site drawing signed by Land Surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.

G. Maintain complete and accurate log of control and survey work as Work progresses.

H. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

I. Promptly report to Architect/Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

J. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.

1.5 PRECONSTRUCTION MEETING

A. Owner will schedule meeting after Notice of Award.

B. Attendance Required: Owner, Architect/Engineer, Contractor, and Subcontractors.

C. Agenda: As described in the NISD - Owner’s Special Conditions.

1.6 SITE MOBILIZATION MEETING

A. Architect/Engineer will schedule meeting at Project site prior to Contractor occupancy.

B. Attendance Required: Owner, Architect/Engineer, Special Consultants, and, Contractor, Contractor’s Superintendent, and major Subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner’s requirements and partial occupancy.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

1.7 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at bi-monthly intervals.
B. Architect/Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner, Architect/Engineer, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems impeding planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
  10. Coordination of projected progress.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Other business relating to Work.

E. Architect will record minutes and distribute copies to the Contractor, Owner, and Consultants.

1.8 PRE-INSTALLATION MEETINGS

A. Contractor shall convene pre-installation conferences at the work site prior to commencing work items as indicated on the Pre-Installation or Pre-Construction Meetings included in the Owner’s Special Conditions.

B. Prepare agenda and preside at meeting in accordance with the NISD – Owner’s Special Conditions.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 SPECIAL PROCEDURES

A. Materials: As specified in product sections.

B. Employ skilled and experienced installer to perform work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

E. Finish surfaces as specified in individual product sections.

END OF SECTION
SECTION 01 33 00
SUBMITTALS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures required for submittal items specified in Division 1 and individual Specification Sections to include, but not be limited to:
   1. Construction Progress Schedules.
   2. Schedule of Values.
   3. Requirements specified in individual Sections.
   4. Shop Drawings.
   5. Product Data, manufacturer's specifications, instructions, manuals and certificates.
   6. Samples.

1.2 RELATED REQUIREMENTS

A. Uniform General Conditions, Supplementary General Conditions and Special Conditions of the Contract.
B. Section 01 30 00 – Administrative Requirements.
C. Section 01 35 10 – Sustainable Design.
D. Section 01 60 00 – Material and Equipment: Manufacturer's instructions and Contractor's list of Products.
E. Section 01 77 00 – Project Closeout.

1.3 QUALITY ASSURANCE

A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. Submittals furnished without the asbestos-free certification will be returned to the Contractor with no action taken until such certification is provided.

1.4 DEFINITIONS

A. Work-related submittals of this section are categorized for convenience as follows:
   1. Shop drawing include specially-prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to a range of similar projects.
   2. Product data include standard printed information on materials, products and systems; not specially-prepared for this project, other than the designation of selections from among available choices printed therein.
   3. Samples include both fabricated and unfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
a. Mock-ups are a special form of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.

4. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and no processed as shop drawings, product data or samples.

1.5 SUBMITTAL PROCEDURES

A. Transmit each submittal with a form acceptable to Architect. Provide sufficient number of copies as needed for Owner and Architect/Engineer to retain a copy as well as copies required by Contractor for project closeout.

B. Each transmittal letter shall be identified with a submittal number corresponding to Specification Section for which items are referenced, followed with a numeric extension indicating the number of submittals within the same Specification Section; ex. SUBMITTAL 08 21 00-01.

C. Items requiring resubmittal shall be identified with original number followed by the letter "-R"; ex. SUBMITTAL 08 21 00-01R1.

D. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing and Detail number, and Specification Section number, as appropriate.

E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

F. Schedule submittals to expedite the Project, and deliver to Architect/Engineer at 5545 Fredericksburg Road, Ste. 100, San Antonio, TX 78229. Coordinate submission of related items.

G. For each submittal for review, allow 30 days for architectural and structural items, 45 days for mechanical, electrical and plumbing items, excluding delivery time to and from the Contractor.

H. Review submittals for compliance with the Contract Documents and certify with stamp of certification. Stamped certified submittal represents that the Contractor has verified field dimensions and checked and coordinated each shop drawing and sample with the requirements of the Work.

I. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

J. Submit initial Progress Schedule and Schedule of Values in duplicate within 7 days after award of Contract. After review by Architect revise and resubmit as required. Submit revised Schedule of Values reflecting changes since previous submittal.

L. After Architect review of submittal, revise and resubmit as required, identifying changes made since previous submittal.

M. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.6 CONSTRUCTION PROGRESS SCHEDULES:

A. Submit initial Schedule in duplicate within 15 days after date established in Notice to Proceed.

B. Revise and resubmit as required.

C. Submit revised Schedule with each Application for Payment, identifying changes since previous version.

D. Submit a computer generated chart with separate line for each major portion of Work or operation, identifying first work day of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

1.7 SCHEDULE OF VALUES

A. Submit in accordance with General Conditions and Section 01 30 00.

B. Submit on form as required in the Owner’s Pre-Construction Conference Manual.

1.8 CONTRACTOR’S APPLICATION AND CERTIFICATE FOR PAYMENT

A. Submit in accordance with General Conditions and the Owner’s Pre-Construction Conference Manual.

1.9 SHOP DRAWINGS

A. Requirements are stated in General Conditions and Supplementary General Conditions and in individual Sections of the Specifications.

B. Submit to Architect/Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

1.10 PRODUCT DATA

A. Mark each copy to identify applicable products, options, and other data; supplement manufacturer’s standard data to provide information unique to the Work. Include manufacturer’s installation instructions when required by the Specification Section.
1.11 SAMPLES

A. Submit full range of manufacturer's standard colors, textures, and patterns for Architect's selection. Submit samples for selection of finishes with reasonable promptness and in orderly sequence so to cause no delay in the Work.

B. Submit samples to illustrate functional characteristics of the products, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing Work.

C. Include identification on each sample, giving full information.

D. Submit the number specified in respective Specification Section; one will be retained by Architect. Reviewed samples which may be used in the Work are indicated in the individual Specification Sections.

E. Provide field finishes at Project as required by individual Specifications Section. Install sample complete and finished. Acceptable finishes in place may be retained in completed Work.

1.12 CONTROLS SYSTEMS SHOP DRAWINGS

A. The complete HVAC control system submittal and shop drawing shall be provided within 90 days after the date of the Notice to Proceed. Failure to submit within this time period shall be considered adequate cause to stop further payment for labor and materials for the HVAC systems until the submittal is received.

1.13 INTERIOR FINISH MATERIAL SUBMITTAL

A. Submit interior finish materials for review and color selection within 45 days of Notice to Proceed. After 60 days, the Architect reserves the right to select materials from manufacturers included in these Specifications at no additional cost to the Owner.

PART 2 - PRODUCTS
Not Used.

PART 3 - EXECUTION
Not Used.

END OF SECTION
PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. General Quality Control.

B. Workmanship.

C. Manufacturer’s Instructions.

D. Manufacturer’s Certificates.

E. Manufacturer’s Field Services.

F. Testing Laboratory Services.

1.2 RELATED REQUIREMENTS

A. Uniform General Conditions, Supplementary General Conditions and Special Conditions of the Contract.

B. Section 01 10 00 – Summary of the Work.

C. Section 01 30 00 – Submittals.

D. Section 01 60 00 – Material and Equipment.

1.3 QUALITY CONTROL, GENERAL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

1.4 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform Work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.

1.5 MANUFACTURERS’ INSTRUCTIONS

A. Comply with manufacturer’s instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Architect before proceeding.
1.6 MANUFACTURERS’ CERTIFICATES
   A. When required by individual Specifications Section, submit manufacturer’s certificate, in duplicate, that products meet or exceed specified requirements.

1.7 INSPECTIONS, TESTS AND REPORTS
   A. Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, design mix of concrete, equipment, storage and assistance as requested.
      1. Notify Owner and Testing Laboratory 24 hours prior to expected time for operations requiring testing services.
      2. Make arrangements with Testing Laboratory and pay for additional samples and tests for Contractor’s convenience and as required by the Uniform General Conditions and Supplementary General Conditions of the Contract.
   B. Contractor shall coordinate and establish a schedule of activities requiring Special Inspections in Section 01 45 23 and the 2015 International Building Code.

PART 2 - PRODUCTS
   Not Used.

PART 3 - EXECUTION
   Not Used.

END OF SECTION
SECTION 01 43 39
SITE MOCK-UP

PART 1 - GENERAL

1.1 RELATED SECTIONS
A. Section 04 05 00 – Masonry Mortar and Grout.
B. Section 04 05 23 – Masonry Accessories
C. Section 04 20 00 – Unit Masonry Assemblies
D. Section 04 72 00 – Cast Stone
E. Section 05 50 00 – Metal Fabrications.
F. Section 07 21 00 – Continuous Thermal Insulation.
G. Section 07 27 20 – Fluid-Applied Liquid Air Barrier.
H. Section 07 62 00 – Flashing and Sheet Metal.
I. Section 07 65 00 – Thru-Wall Flexible Flashing and Drainage System.
J. Section 07 92 00 – Joint Sealants.
K. Section 08 41 00 – Aluminum Entrances, Storefront & Window Framing.
L. Section 08 81 00 – Glazing.

1.2 SITE MOCK-UP
A. Using the masonry, cold formed metal framing, sheet metal and trim, dampproofing, flexible
flashing (seal strip), thru wall flashing, exterior metal wall system, aluminum windows, and
glass specified, erect mock-up at site in location and orientation as designated by Architect.
B. The mock-up construction shall, when approved by Architect, become the site reference for
quality of the incorporated features of approved brick masonry, CMU, color and texture and
mortar color and joint treatment, flashing, exterior metal wall system color, waterproofing and
both aluminum window frame and glass color and joint sealant treatment and color.

PART 2 - PRODUCTS

2.1 MATERIALS
Refer to applicable Sections for materials to be incorporated into site mock-up.

PART 3 - EXECUTION

3.1 Refer to applicable Sections for installation of incorporated materials.

3.2 Refer to Drawings for details of Site Mock-Up.

END OF SECTION
SECTION 01 45 23
SPECIAL TESTING AND INSPECTION SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Special Testing Agency responsibilities.
B. Special Testing Agency reports.
C. Limits on Special Testing Agency authority.
D. Contractor responsibilities.

1.2 RELATED SECTIONS
A. General Conditions of the Contract for Construction: Inspections, testing, and approvals required by public authorities.
B. Refer to Special Inspections Table for Structural Elements – 2018 shown on Structural Drawing S0.4.

1.3 REFERENCES
B. Divisions 02, 03, 04 and 05.

1.4 DEFINITIONS
A. Special Inspection: Inspection required of the materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with Construction Documents and referenced standards.
B. Special Inspection, Continuous: The full-time observation of Work requiring special inspection by a special inspector who is present in the area where the Work is being performed.
C. Special Inspection, Periodic: The part-time or intermittent observation of Work requiring special inspection by special inspector who is present in the area where the Work has been or is being performed and at the completion of the Work.

1.5 SELECTION AND PAYMENT
A. Owner will employ and pay for services of an independent Special Testing Agency to perform specified Special Testing and Inspections.
B. Employment of Special Testing Agency shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.6 SPECIAL TESTING AGENCY RESPONSIBILITIES
A. Test samples or materials provided by Contractor.
B. Provide qualified, trained personnel at site. Cooperate with Architect and Contractor in performance of services.
C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
D. Ascertain compliance of materials with requirements of Contract Documents.
E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.
F. Perform additional inspections and tests required by Authorities Having Jurisdiction.
G. Attend pre-construction conferences and progress meetings appropriate to phase of Work.

1.7 SPECIAL TESTING AGENCY REPORTS
A. After each inspection and test promptly submit three copies of report to Architect, one copy to Owner and two copies to Contractor.
B. Will Include:
   1. Date issued.
   2. Project title and number.
   3. Name of inspector.
   4. Date and time of sampling or inspection.
   5. Identification of Product and Specifications Section.
   6. Location materials being sampled and tested were placed in the Project.
   7. Type of inspection or test,
   8. Date of test.
   9. Results of tests.
C. Provide interpretations of test results to Architect.

1.8 LIMITS ON SPECIAL TESTING SERVICE AUTHORITY
A. Agency may not:
   1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Approve or accept any portion of the Work.
   3. Assume any duties of Contractor.
B. Agency has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES
A. Provide Agency access to designated location, adequate samples of materials proposed to be used which require testing.
B. Cooperate with Agency personnel, and provide access to the Work and to manufacturer’s or fabricator’s facilities.
C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
D. Notify Agency not less than 24 hours prior to expected time for operations requiring inspection and testing services.
E. Pay costs of re-testing when original tests indicate material tested fails to meet specified requirements. Cost for re-testing and inspections occasioned thereby will be deducted from the Contract Sum.
F. Pay cost for additional testing when originally specified tests were not conducted timely due to failure of the Contractor to provide Service adequate advance notice to schedule personnel. Cost for additional tests and inspections occasioned thereby will be deducted from the Contract Sum.
PART 2 - PRODUCTS

Refer to Divisions 02 thru 33.

PART 3 – EXECUTION: SHALL INCLUDE BUT SHALL NOT BE LIMITED TO

3.1 GENERAL

Special Testing and Inspection Services shall include the following:

3.2 SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

A. Refer to Special Inspections Table for Structural Elements – 2018 shown on Structural Drawing S0.4.

3.3 SECTION 04 05 00 – MASONRY MORTAR AND GROUT

A. Refer to Special Inspections Table for Structural Elements – 2018 shown on Structural Drawing S0.4.

3.4 SECTION 05 12 00 - STRUCTURAL STEEL

A. Refer to Special Inspections Table for Structural Elements – 2018 shown on Structural Drawing S0.4.

3.5 SECTION 07 80 11 - CEMENTITIOUS FIREPROOFING

A. Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Section 1705.14 of the IBC 2018.

B. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members.

C. Special inspections and tests shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

3.6 SECTION 07 84 00 – FIRESTOPPING

A. Special Inspections shall be performed for through-penetrations, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems that are tested and listed in accordance with Sections 714.3.1.2, 714.4.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2 of the IBC 2018.

3.7 SECTION 31 23 00 – EXCAVATION AND FILL

A. Refer to Special Inspections Table for Structural Elements – 2018 shown on Structural Drawing S0.4.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, and sanitary facilities.
B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
C. Construction Facilities: Access roads, parking, progress cleaning, project signage, and temporary buildings.

1.2 RELATED SECTIONS
A. Section 01 77 00 - Project Closeout: Final cleaning.

1.3 TEMPORARY ELECTRICITY
A. Cost: By Contractor; provide and pay for power service required from utility source.
B. Provide temporary electric feeder from electrical service arranged with Utility Company. Do not disrupt Owner's use of service.
C. Complement existing power service capacity and characteristics as required.
D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
E. Provide main service disconnect and over-current protection at convenient location.
F. Permanent convenience receptacles may not be utilized during construction.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES
A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
C. Provide and maintain 0.25 watt/sq ft H.I.D. lighting to interior work areas after dark for security purposes.
D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
E. Maintain lighting and provide routine repairs.
F. Permanent building lighting may be utilized during construction.
1.5 **TEMPORARY HEATING**

A. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

B. Enclose building prior to activating temporary heat in accordance with the Exterior Enclosures article in this section.

C. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

D. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in product sections.

1.6 **TEMPORARY COOLING**

A. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

B. Enclose building prior to activating temporary cooling in accordance with the Exterior Enclosures article in this section.

C. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

D. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, except as otherwise noted.

1.7 **TEMPORARY VENTILATION**

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.8 **TELEPHONE SERVICE**

A. Provide, maintain, and pay for telephone service to field office at time of project mobilization. Service shall be maintained for the duration of operations under this Contract.

1.9 **TEMPORARY WATER SERVICE**

A. Provide, maintain and pay for suitable quality water service required for construction operations at time of project mobilization.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections.
1.10 **TEMPORARY SANITARY FACILITIES**

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

1.11 **BARRIERS**

A. Provide barriers to prevent unauthorized entry to construction areas and to protect adjacent properties from damage from construction operations.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.

C. Provide barricade, temporary ramp and walkway as required to provide egress from existing Cafeteria exterior door. Maintain proper egress throughout course of construction.

D. Provide protection for plants designated to remain. Replace damaged plants.

E. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.12 **FENCING**

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular gates with locks.

1.13 **WATER CONTROL**

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from standing or running water. Provide water barriers as required to protect site from soil erosion.

1.14 **EXTERIOR ENCLOSURES**

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.15 **PROTECTION OF INSTALLED WORK**

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.16 SECURITY
A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

1.17 ACCESS ROADS
A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

1.18 PARKING
A. Provide temporary gravel surface parking areas to accommodate construction personnel within the site space.

B. Do not allow vehicle parking on existing pavement.

1.19 PROGRESS CLEANING AND WASTE REMOVAL
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site and dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.20 PROJECT IDENTIFICATION
A. Provide 96 inch wide x 98 inch high project sign of exterior grade plywood and wood frame construction, painted, with die cut vinyl, self-adhesive letters and logos, to Architect/Engineer's design and colors as indicated on Exhibit ‘J’ of the Owner’s Special Conditions.
B. Erect on site at location established by Architect/Engineer.
C. No other signs are allowed without Owner permission except those required by law.

1.21 FIELD OFFICES AND SHEDS

A. Office: Weather tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture drawing rack, and drawing display table.
B. Provide space for Project meetings, with table and chairs to accommodate 15 persons.

1.22 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
C. Clean and repair damage caused by installation or use of temporary work.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION
PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED
A. Products.
B. Transportation and Handling.
C. Storage and Protection.
D. Substitutions and Product Options.
E. U.L. Labels.

1.2 RELATED REQUIREMENTS
A. Uniform General Conditions, Supplementary General Conditions and Special Conditions of the Contract.
C. Section 01 30 00 – Submittals: Submittal of manufacturer’s certificates.
D. Section 01 77 00 – Project Closeout: Operation and Maintenance Data and Warranties and Bonds.

1.3 PRODUCTS
A. Products include material, equipment and systems.
B. Any material or construction procedure specified by reference to the number, symbol or title of a specific standard such as Commercial Standard, Federal Specification, American Society of Testing Material, a trade association standard or other similar standards, shall comply with the standards referred to, incorporating limits as to type, class or grade or other modification in such reference, as if the standard was printed in the Specifications.
C. Except when the year or edition of the standard is indicated in the reference, the latest revision, amendment or supplement to the standard in effect on the date the bidding documents are issued is applicable.
D. Unless specified to the contrary, all materials of the construction shall be new and of the best of the kinds and grades specified and all workmanship shall be up to the best recognized standards known to the various trades. Salvaged materials may be used when approved by the Architect in some remodeled areas if required for matching remaining materials.

1.4 TRANSPORTATION
A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer’s unopened containers or packaging, dry.
B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct and products are undamaged.
1.5 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

C. Do not stack materials in a manner which would overload supporting material of structures.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.

F. After installation, provide coverings to protect products from damage for traffic and construction operations; remove when no longer needed.

1.6 PRODUCT OPTIONS

A. Within ten (10) days after date of Contract, submit complete list of major products proposed, with the name of manufacturer, trade name and model.

B. Options:
   1. Products specified by Reference Standards or by Description Only: Any products meeting those standards.
   2. Products specified by Naming One or More Manufacturer: Prior to Bid Opening, in accordance with paragraph SUBSTITUTIONS, submit a request for substitution for any manufacturer not specifically named only if the substitute product is equal or better in quality and completely fits this Project's requirements.

1.7 SUBSTITUTIONS

A. The listing of product manufacturers in the various sections of the Specifications, or on the drawings, is intended to establish a standard of quality only and is not intended to preclude open, competitive bidding.

B. Equal products of other manufacturers will be acceptable provided the applicable provisions of the GENERAL CONDITIONS and SUPPLEMENTARY GENERAL CONDITIONS are complied with.

C. Substitution requests must be submitted to and received by the Architect within Thirty (30) Days after the Contract has been executed in accordance with Subparagraph 3.4.2.1 of the Supplementary Conditions.

D. Substitution Requests will be considered only if there is no decrease in quality and only when a request submitted by or through and bearing the approval of the General Contractor. Such requests for substitution consideration shall be submitted promptly in order to allow adequate time for checking and study by the Architect without delaying the project.

E. Substitution submittals shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, samples, performance and test data and any other information necessary for an evaluation.

F. A statement setting forth any changes in other materials that incorporation of the substitute would require in equipment or work shall be included.
G. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's/Owner's decision of approval or disapproval of a proposed substitution shall be final.

H. Requests for time extensions will NOT be approved for delays due to rejected substitutions. NO substitution will be allowed without the Architect's approval in writing.

I. Should a substitution be approved under the foregoing provisions, and subsequently prove to be defective or otherwise unsatisfactory for the service for which it was intended, the Contractor shall, without cost to Owner, and without obligation on the part of the Architects, replace the same with the material originally specified.

1.8 U.L. LABEL

A. Where applicable, all such materials and equipment, for which Underwriters' Laboratories, Inc. standards have been established, and their label service is available, shall bear the appropriate U.L. Label.

PART 2 - PRODUCTS

   Not used.

PART 3 - EXECUTION

   Not used.

END OF SECTION
SECTION 01 77 00
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Prerequisites to Substantial Completion.
B. Prerequisites to Final Acceptance.
C. Record Document Submittals.
D. Closeout Procedures.
E. Final Cleaning.

1.2 RELATED DOCUMENTS

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

1.3 DEFINITIONS

A. Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 33. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.

1.4 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. General: Prior to requesting Architect/Engineer's inspection for certification of substantial completion, (for either entire Work or portions thereof), complete the following and list known exceptions in request.
   1. In progress payment request, coincide with or first following date claimed, show either 100% completion for portion of work claimed as "substantially complete", or list incomplete items value of incompletion, and reasons for being incomplete.
   2. Include supporting documentation for completion as indicated in these contract documents.
   3. Submit a statement showing an accounting of changes to the Contract Sum.
   4. Advise Owner of pending insurance change-over requirements.
   5. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
   6. Obtain and submit releases enabling Owner's full, unrestricted use of the Work and access to services and utilities. Where required, include occupancy permits, operating certificates and similar releases.
   7. Deliver tools, spare parts, extra stocks of material and similar physical items to the Owner. Obtain signed receipts from the Owner and bind them into the close-out documents.
   8. Make the final change-over of locks and transmit the keys to the Owner. Advise the Owner's personnel of the change-over in security provisions.
9. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock-ups, and similar elements.

10. Complete final cleaning up requirements, including touch-up painting of marred surfaces.

B. Inspection Procedures: Upon receipt of Contractor's request for inspection, the Architect/Engineer will either proceed with inspection or advise Contractor of prerequisites not fulfilled. Following initial inspection, Architect/Engineer will either prepare certificate of substantial completion, or will advise Contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assured that work has been substantially completed. Results of completed inspection will form initial "punch list" for final acceptance.

1.5 PREREQUISITES TO FINAL ACCEPTANCE

A. General: Prior to requesting Architect's/Engineer's final inspection for certification of final acceptance and final payment, as required by General Conditions, complete the following and list known exceptions (if any) in request:

1. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Architect/Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Architect/Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of substantial completion, or Owner took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety.

6. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: Upon receipt of Contractor's notice that all work has been completed, including punch-list items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstances, Architect/Engineer will reinspect the work. Upon completion of reinspection, Architect/Engineer will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.

1.6 RECORD DOCUMENT SUBMITTALS

A. General: Specific requirements for record documents are indicated in the individual sections of these specifications. Other requirements are indicated in the General Conditions. General submittal requirements are indicated in "Submittal" sections. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistant location; provide access to record documents for the Architect/Engineer's reference during normal working hours.
B. Record Drawings: Maintain a white-print set (blue-line or black-line) of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on the working drawings. Mark with red erasable pencil, and where feasible, use other colors to distinguish between variations in separate categories of work. Mark up new information which is recognized to be of importance to Owner, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work which would be difficult to measure and record at a later date. Note related change-order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of set. Upon completion of the project, the Contractor shall record all such changes on one (1) set of Contractor furnished reproducible mylars (3-mil) and shall then furnish the Architect with both the white-print set and the set of mylar reproducible drawings which shall be marked by the Contractor on each Sheet as "Record Drawing".

C. Record Specifications: Maintain one copy of specifications, including addenda, change orders and similar modifications issued in printed form during construction and mark-up variations (of substance) in actual work in comparison with text of the specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Architect/Engineer for the Owner's records.

D. Record Product Data: Maintain one copy of each product data submittal and mark-up significant variations in actual work in comparison with submitted information. Include both variations in product as delivered to the site, and variations from the manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications. Upon Completion of mark-up, submit complete set to the Architect/Engineer for the Owner's records.

E. Record Sample Submittal: Immediately prior to date of substantial completion, Architect/Engineer (and including Owner's personnel where desired) will meet with Contractor at site, and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with Architect's/Engineer's instructions for packaging, identification marking, and delivery to Owner's sample storage space.

F. Miscellaneous Record Submittal: Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittal in connection with the actual performance of the Work. Immediately prior to the date or dates of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect/Engineer for the Owner's records.

G. Maintenance Manuals: Organize maintenance-and-operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb-tabbed). Include emergency instructions, spare parts listing, copies of warranties, 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 2", 3-ring vinyl-covered binder, and include pocket folders for folded sheet information. Mark identification on both front and spine of each binder. Upon completion of the project, submit three (3) complete sets of the maintenance manuals.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. General Operating and Maintenance Instructions: Arrange for each installer of work requiring continuing maintenance, or operation, to meet with Owner's personnel, at project site, to provide basic instructions needed for proper operation and maintenance of 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, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities. For operational equipment, demonstrate start-up, shut-down, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, energy effectiveness, and similar operations. Review maintenance and operations in relation with applicable warranties, agreements to maintain, bonds, and similar continuing commitments. The Contractor shall obtain a sign-in sheet of all persons in attendance for the Operation and Maintenance Instruction period. The sign-sheet shall be bound into the operating and maintenance manuals.

3.2 FINAL CLEANING:

A. General: Special cleaning for specific units of work is specified in sections of Divisions 2 through 33. General cleaning during progress of work is specified in General Conditions and as temporary services in "Temporary Facilities" section of this Division. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples, but not by way of limitation, of 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 which are noticeable as vision-obscuring materials.
3. Replace broken glass and other damaged transparent materials.
4. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to their original reflective condition.
5. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substances.
6. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
8. Vacuum clean carpeted surfaces and similar soft surfaces.
9. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
10. Clean food service equipment to a condition of sanitary ready and acceptable for intended food service use.

11. Clean light fixtures and lamps so as to function with full efficiency.

12. 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 which are neither planted nor paved, to a smooth, even textured surface.

B. Pest Control: Engage an experienced exterminator to make a final inspection of the project, and to rid project of rodents, insects, and other pests.

C. Removal of Protections: Except as otherwise indicated or requested by the Architect/Engineer, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.

D. Compliances: Comply with safety standards and governing regulations for cleaning operations. Do no burn waste materials at the site, or bury debris or excess materials on 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.

1. Where extra materials of value remaining after completion of associated work have become the Owner's property, dispose of these to the Owner's best advantage as directed.

END OF SECTION
PARTS 1 – GENERAL

1. INDOOR AIR QUALITY GOALS:
   A. Sustain the comfort and well-being of construction workers during the construction process.
   B. Protect the health of future occupants in the completed building.
   C. Protect the health of existing occupants in adjacent occupied areas and buildings.
   D. Establish and sustain a successful management of an indoor air quality plan during construction and before occupancy.
   E. All subcontractors will attend an educational session about the indoor air quality management implemented during construction.
   F. All the following information below will be agenda items to be discussed regularly at preconstruction and construction meetings.

2. ON-SITE INDOOR AIR QUALITY MEASURES:
   A. Preventive job-site practices will reduce the potential for residual problems with indoor air quality in the completed building and reduce undue health risks for workers.
      i) HVAC Protection
      ii) Source Control
      iii) Pathway Interruption
      iv) Housekeeping
      v) Scheduling
      vi) Materials Protection
      vii) Job-site inspection and maintenance of IAQ measures
      viii) Prohibit smoking

3. CONTRACTOR’S RESPONSIBILITIES:
   A. A member of the construction team shall be identified as the IAQ Manager and shall be responsible for the following:
      i) Ensure that all members of the project team are knowledgeable about indoor quality issues and have defined responsibilities for implementation of good indoor air quality practices.
      ii) Establish subcontractor agreements that communicate the goals of the construction indoor air quality plan and maintain continual communication to reinforce the importance of the IAQ plan.
      iii) Keep a copy of the Construction Indoor Air Quality Plan on site and review it regularly to ensure job site operations are in compliance.
      iv) Monitor the work of subcontractors to ensure indoor air quality is not affected during daily construction progress. Identify activities that may adversely impact indoor air quality, notify the responsible party, review corrective procedures and institute remedial or corrective action as necessary.
      v) Provide subcontractors and field personnel with the proper resources (i.e. collection bins, cleaning tools and materials) to encourage compliance.
      vi) Include issues related to the Construction Indoor Air Quality Plan on the agenda during regularly scheduled construction and safety meetings. Review and discuss the status, procedures and importance of the construction indoor air quality goals.
      vii) Include the following agenda items for regular discussion at preconstruction and construction meetings:
         (1) Job-site inspection and maintenance of IAQ measures
         (2) IAQ concerns and problems that require correction
viii) Conduct regular inspection and maintenance of indoor air quality measures including ventilation system protection.

ix) During Job Site Coordination meetings, review and discuss status of IAQ requirements and procedures with the Project Team.

1. Document all occurrences of Construction Indoor Air Quality Plan non-compliance with a written report and photographs.

2. Document the implementation of Construction Indoor Air Quality Plan procedures with written, dated reports and photographs.

3. Provide signage on the jobsite during construction that clearly states that smoking is prohibited inside the building and within 25 feet of all building entrances.

4. SUBCONTRACTOR RESPONSIBILITIES:

A. Ensure that each foreman and all field crews are familiar with the goals and procedures contained in the Construction Indoor Air Quality Plan.

B. Attend construction progress and safety meetings and provide supporting documentation if requested or required.

C. Take precautionary measures to reduce health risks for workers. Require VOC safe masks for workers installing VOC emitting products. (defined as products that emit 150 g/L or more VOCs)

D. OSHA requires the use of personal protective equipment (PPE) to reduce employees’ exposures to hazards when engineering and/or administrative controls are not feasible or effective in reducing these exposures to acceptable levels. Subcontractors are responsible for determining if PPE will be used to protect their workers.

E. Appropriate working apparel, hard hats, boots, etc., are required. Wearing contaminated work clothes is unacceptable.

F. Submit a construction schedule to prevent materials from acting as sinks for storage and subsequent release of contaminants emitted from finishes which have the potential for short-term off-gassing. In the schedule, the contractor will include appropriate allowances for drying or curing times before installation of materials that have a fibrous or porous nature that tend to absorb contaminants.

G. Report occurrences that may affect or represent a potentially negative impact on indoor air quality long-term to General Contractor's Superintendent, immediately.

5. EXECUTION OF CONTROL MEASURES:

The Contractor and all Subcontractors are required to meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008, Chapter 3. Contractor is required to keep a copy of the referenced standard onsite. Visit www.smacna.org or call (703) 803-2980 to obtain a copy of the referenced standard. Minimum control measures for an effective IAQ plan during the construction phase include the following:

A. HVAC Protection:

i) The intent of this section is to protect all HVAC equipment from collecting dust and/or odors. Odors can be absorbed by porous materials in the system and be released later.

ii) HVAC equipment shall be delivered on-site sealed in plastic on pallets protecting the interior of the units from dust, debris and moisture. Equipment will be stored on raised pallets and sealed in plastic until installation. If necessary, the plastic can be removed during installation and replaced immediately afterward. Seal all duct and equipment openings with plastic. The protective plastic covering will remain until the system is tested prior to occupancy. At that time, all vents and ducts will be inspected for contamination. If any dust deposits are observed, the area will be cleaned by a professional with expertise in the proper use of equipment and procedures for duct cleaning.

iii) The permanently installed HVAC system shall not be used during demolition or construction without prior approval of Owner and Mechanical Engineer of Record. Use temporary air handling units as needed to maintain proper temperature and humidity for finishes until the HVAC system is released for use by the Owner. Ensure
that all parts of the system are properly covered/protected and stored off the ground in a clean, dry location where contaminants are not introduced, away from construction.

iv) All supply and return ducts must be sealed during construction at all times. The return side of the HVAC system is, by definition under negative pressure and thus capable of drawing in nearby construction dust and odor. Isolate the return side of the HVAC system from the surrounding environment as much as possible and seal all return system openings with plastic. The permanent HVAC system will be shutdown whenever possible during heavy construction and demolition.

v) If the permanent HVAC system is approved for use during construction, protect the return side by installing temporary filtration media over grilles and openings with a Minimum Efficiency Reporting Value (MERV) of 8 as determined by ASHRAE 52.2 – 1999. For open plenum returns, the return air ducts in the plenum will need MERV 8 filters. To prevent dirt contamination to the air terminal units prior to the installation of ceiling tiles and return grilles:
   (1) Have the primary air damper on the air terminal units set to fully open (by controls contractor).
   (2) Remove and store the filter from the air terminal units.
   (3) Block the return air intake at the air terminal units. The intake at the air terminal unit is located at the filter location. Once the ceiling and return air grilles are in place the MERV 8 filtration must be shifted to the return grille or other openings in the plenum if the air handlers are to be used during construction.

vi) During construction, filters will be inspected every other day and replaced as needed. Maintain a filter schedule to show the type of filters installed, inspection dates and replacement dates.

vii) If an unducted ceiling plenum returns over the construction zone must be used, it should be isolated by having all ceiling tiles in place. Check for leaks in the ducts and air handlers and repair promptly.

viii) If permanently installed HVAC system is approved for used during construction, heaviest work areas shall be dampered off or blocked if temporary imbalance of the return air system does not create a greater problem.

ix) If permanent HVAC systems are approved for use during construction, filtration with media such as activated charcoal or potassium permanganate shall be used as needed to control construction related odors.

x) Mechanical rooms shall not be used to store construction or waste materials.

xi) All HVAC equipment is scheduled for commissioning and testing prior to occupancy.

xii) If contamination occurs, affected components will be cleaned prior to start-up testing.

xiii) The mechanical contractor shall provide data sheets of filtration media used during construction and installed immediately prior to building flush-out and prior to building occupancy.

B. Source Control

Minimize the sources of construction pollution by complying with the following measures:

i) Use low-emitting materials as specified by the architect.

ii) Recover, isolate and ventilate containers housing toxic materials.

iii) Store liquids outdoors. To reduce the possibility of spills during storage, transfer, or mixing, store all odorous or toxic liquids outside the building and protect against freezing. Any pollution sources within the building will be stored in spaces that are exhausted directly to the outside away from openings and intakes. Do not use the mechanical rooms for storage.

iv) Keep containers closed. Containers storing VOC-emitting products such as fuel, paints, finishes and solvents will be kept tightly sealed and away from absorptive materials when not in use. These items will remain outside of the building(s) when not in use.

v) Avoid use of combustion equipment indoors. Engines, heaters or equipment that runs on gasoline, diesel, kerosene or other fossil fuels shall not be operated indoors unless absolutely necessary and only when large quantities of exhaust ventilation, such as the use
of large industrial fans located downwind at nearby openings, are provided to remove combustion pollutants such as carbon monoxide, moisture, and dust. Emissions from propane-powered equipment such as generators and forklifts are cleaner but potentially harmful under some circumstances. Exhaust fumes from idling vehicles and gasoline-fueled tools within the building must be exhausted to the exterior of the building through the use of funnels or temporary piping. Use of electric power tools, hoists, forklifts and machinery will be considered whenever possible.

vi) Operation of motor vehicles. Motor vehicles will not be operated within the building. Motorized equipment or delivery vehicles used near doors or openings will be limited. Turn off engines when not in use and do not allow idling.

vii) Reduce construction dust. Minimize the amount of dust in the air and on surfaces. Vacuum assisted cut-off saws, grinders and drywall sanding equipment shall be used to minimize dust. Empty dust collection systems into receptacles located outside of the building.

viii) No smoking or chewing tobacco is allowed on school property.

ix) Permanently seal all abandoned sewer and waste piping. Unsealed abandoned floor drains and pipes can emit sewer gas back into the occupied spaces.

x) Confirm that all new and abandoned gas and refrigerant piping has been properly pressure tested and is leak-free. Abandoned refrigeration lines will be decommissioned and permanently sealed.

xi) Seal all newly installed piping to prevent dust contamination.

xii) Roofing kettles shall be equipped with emissions control equipment and shall be staged downwind of any building openings or outside air intakes.

C. Pathway Interruption

i) Temporary barriers shall be constructed to isolate areas under construction from clean or occupied areas.

ii) Prevent air movement from the work site to clean or occupied spaces by interrupting potential contaminant pathways, and by manipulating the following factors to achieve environmental control:

1) Depressurize the work area.
   (a) Adjust the balance of the existing HVAC and exhaust systems (if prior approval is given by Owner and Mechanical Engineer of Record).
   (b) Install portable fans.
   (c) Exhaust the work site at a rate at least 10% greater than the rate of supply (if prior approval is given by Owner and Mechanical Engineer of Record).

2) Pressurize occupied space
   (a) Increase supply air or decrease exhaust air in occupied spaces (if prior approval is given by Owner and Mechanical Engineer of Record).
   (b) Protect HVAC system from construction emissions.

3) Erect barriers to contain construction area
   (a) Dust curtains to control nuisance dust.
   (b) Continuous plastic seal to control hazardous dust.

4) Relocate pollutant sources
   (a) Do not store construction products and waste materials in mechanical rooms.
   (b) Locate emissive materials as far away from air intakes as possible.
   (c) Roofing tar kettles shall be located as far away from air intakes and building openings as possible.
   (d) Refurbishing of mechanical equipment shall be performed outdoors or in a shop.

5) Temporarily seal the building when construction emissions are occurring on the roof or adjacent to a building, and there is no other alternative, seal intake dampers and other building openings to prevent emissions from entering the building through the HVAC system.

D. Housekeeping
As dust accumulates at the construction site, it will become airborne when disturbed by nearby activity. Similarly, spills or excess applications of products containing solvents will increase odors at the project site.

i) Clean daily to remove construction dust and debris. Promptly clean up spills.

ii) Remove accumulated water daily and keep work areas as dry as possible to discourage the growth of mold and bacteria. Take extra measures when working with hazardous materials, and clean in accordance with any requirements or regulations for the product involved.

iii) Suppress dust with sweeping compounds. Use damp rags, mops or vacuum cleaners to clean up dust instead of brooms to clean construction dust from floors whenever possible.

iv) Building materials, especially those with moisture absorbing properties like wood, insulation, paper and fabric, shall be kept dry to prevent the growth of mold and bacteria.

v) Cover dry materials with plastic to prevent water damage or dust contamination, and if resting on the ground, use spacers to allow air to circulate between the ground and the materials.

vi) Water damaged materials shall be dried within 24 hours. Due to the possibility of mold growth, materials that are damp or wet for more than 72 hours shall be discarded.

vii) Clean spills immediately. If solvents, cleaners, gasoline or other odorous or potentially toxic liquids are spilled onto the floor, they shall be cleaned up immediately. If a spill occurs on a porous building material, discard the affected product and replace it with new material.

E. Scheduling

i) Coordinate construction activities to minimize or eliminate disruption of operations in the occupied portions of the building.

ii) Conduct activities with high pollution potential during off hours, such as weekends or evenings, to allow time for new materials to air out. Plan adequate time to conduct testing and balance, commissioning, and IAQ flush out and/or testing procedures before occupancy.

iii) Ensure that construction activity is sequenced to minimize the absorption of VOCs by absorptive building materials.

iv) Schedule construction operations so that absorptive materials like ceiling tile and carpeting are installed only after all applications of wet and odorous materials such as adhesives, sealants, paints and other coatings have been completed.

v) Prior to absorptive materials being installed, building will be dried in with doors and windows on all openings.

vi) Replace all filtration media immediately prior to occupancy. Permanent filtration media shall have a minimum MERV rating of 11.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION
1.1 SUMMARY

A. Section Includes:
   1. Demolishing designated building equipment and fixtures.
   2. Demolishing designated construction.
   3. Cutting and alterations for completion of the Work.
   4. Removing designated items for reuse and Owner’s retention.
   5. Protecting items designated to remain.
   6. Removing demolished materials.

1.2 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition or subsurface obstructions.

C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists.

1.3 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.

B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.

C. Obtain required permits from authorities having jurisdiction.

D. Perform Work in accordance with City of San Antonio Public Work’s standard.

1.4 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.5 SCHEDULING

A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.

B. Schedule Work to coincide with new construction.

C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation.

D. Perform noisy, malodorous, or dusty work after school hours, evenings or weekends.
E. Coordinate utility and building service interruptions with Owner.
   1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner.
   2. Schedule tie-ins to existing systems to minimize disruption.
   3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.6 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Mark location and termination of utilities.

C. Erect, and maintain temporary barriers and security devices for protection of the public, Owner, and existing improvements indicated to remain. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.

D. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.

E. Provide appropriate temporary signage including signage for exit or building egress.

F. Do not close or obstruct building egress path.

G. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

3.2 SALVAGE REQUIREMENTS

A. Items that are to be salvaged by the Contractor for reuse on the project are noted on the Drawings.

B. The Owner shall identify salvageable building components and equipment and shall remove items prior to start of Work.

3.3 DEMOLITION

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Maintain protected egress from and access to adjacent existing buildings at all times.
C. Do not close or obstruct roadways without permits.

D. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer.

E. Disconnect and remove designated utilities within demolition areas.

F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.

G. Demolish in orderly and careful manner. Protect existing improvements, supporting structural members and vegetation.

H. Carefully remove building components indicated to be reused.
   1. Disassemble components as required to permit removal.
   2. Package small and loose parts to avoid loss.
   3. Mark components and packaged parts to permit reinstallation.
   4. Store components, protected from construction operations, until reinstalled.

I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

K. Remove temporary Work.

END OF SECTION
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 specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Suspended beams.
   2. Grade supported beams and slabs.
   3. Foundation piers

B. WORK INCLUDED

1. Design, fabrication, erection, and stripping of formwork for cast-in-place concrete including bracing, proprietary forming systems, prefabricated forms, bulkheads, keys, blockouts, sleeves, pockets, and accessories. Erection shall include installation in formwork of items furnished by other trades.
2. Furnish all labor and materials required to fabricate, deliver and install reinforcement and embedded metal assemblies for cast-in-place concrete, including steel bars, welded steel wire fabric, ties and supports.
3. Furnish all labor and materials required to perform the following:
   a. Cast-in-place concrete
   b. Concrete mix designs
   c. Grouting structural steel baseplates
   d. Concrete for drilled piers

C. Related Sections include the following:
   1. Division 31 Section “Drilled Piers” for drilled concrete piers.
   2. Division 32 Section “Concrete Paving” for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: fly ash and other pozzolans subject to compliance with requirements.

1.4 SUBMITTALS

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

B. Design Mixtures: For each concrete mixture submit proposed mix designs in accordance with ACI 318, chapter 5. Each proposed mix design shall be accompanied by a record of past performance.
   1. Submit mix designs on forms supplied at the end of this Section.
   2. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   3. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar
diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. **Do not reproduce the structural drawings for use as shop drawings.**
2. Embedded metal assemblies: Submit shop drawings for fabrication and placement. Use standard AWS welding symbols.

D. Steel Reinforcement Submittals for Information: Mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis.

E. Formwork Shop Drawings, for information only: Detailing fabrication, assembly, and support of formwork. Shop drawings will be retained for Architects file and will not be approved or returned.

F. Qualification Data: For Installer and manufacturer.

G. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

H. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials
   2. Non-Shrink Grout
   3. Steel reinforcement and accessories
   4. Curing compounds

I. Submit manufacturer's certification of maximum chloride ion content in admixtures.

J. Construction Joint Layout: Submit a diagram of proposed construction joint locations for horizontal framing that exceed the limits of a single placement as stated in the structural notes, other than those indicated on the Drawings.

K. Field quality-control test and inspection reports.

L. Floor surface flatness and levelness measurements to determine compliance with specified tolerances

M. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Owner may engage a qualified independent testing agency to perform material evaluation tests.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
   1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Concrete subcontractor.
   2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Store all proprietary materials in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Coordinate application with exposed concrete surfaces on the Architectural drawings.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. High-density overlay, Class 1 or better.
      b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
      c. Structural 1, B-B or better; mill oiled and edge sealed.
      d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
   3. Steel Forms

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

E. 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.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

G. Form Ties for Exposed Finishes: Water seal coil type internally disconnecting ties with tapered plastic cone spreader designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal. Plugs to fill tie cone to be in plastic or mortar to match surrounding concrete. Plugs to be recessed 1/4 inch from surface of finished concrete.
   1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

H. Expanded Polystyrene (EPS) Geofoam:
   1. Lightweight expanded polystyrene with a minimum compressive strength of 2.2 pounds per square inch (psi) at a 1% deformation.
   2. Geofoam shall be in compliance with ASTM D 6817.
   3. Geofoam shall be shaped to provide continuous support for raised slabs or to act as a lightweight fill material at locations indicated on the drawings.
   4. All Geofoam blocks shall be treated by the manufacturer with a tested and proven termite treatment for below grade applications, 3 year minimum field exposure. The treatment shall be EPA registered, meet the requirements of ICC ES AC 239, and be recognized in an ICC ES report.
   5. Available Products:
      b. InsulFoam GF, Insulfoam, LLC.

I. Soil Retainers: Shall be provided where specified and shown on the drawings to prevent migration of backfill under suspended foundation elements:
   1. Provide precast concrete soil retainers as indicated on drawings.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
C. Plain-Steel Wire: ASTM A 82, as drawn.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.


2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
   2. For slabs on grade provide sand plates, horizontal runners, or precast concrete blocks on bottom where base material will not support chair legs or where vapor retarder has been specified.

2.4 EMBEDDED METAL ASSEMBLIES

A. Steel Shapes and Plates: ASTM A36

B. Headed Studs: Heads welded by full-fusion process, as furnished by TRW Nelson Stud Welding Division.

C. Welded Deformed Bar Anchors: Welded by full fusion process, as furnished by TRW Nelson Stud Welding Division.

2.5 INSERTS

A. Provide metal inserts required for anchorage of materials or equipment to concrete construction where not supplied by other trades:
   1. In vertical concrete surfaces for transfer of direct shear loads only, provide adjustable wedge inserts of malleable cast iron, complete with bolts, nuts, and washers. Provide 3/4" bolt size unless otherwise indicated.
   2. In horizontal concrete surfaces and whenever inserts are subject to tension forces, provide threaded inserts of malleable cast iron, furnished with full depth bolts, 3/4" bolt size unless otherwise indicated.

2.6 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I/II, gray:
      a. Fly Ash: ASTM C 618, Class F or C.

B. Normal-Weight Aggregates: ASTM C 33, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: As indicated on drawings.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.


2.7 ADMIXTURES


B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
   1. Products:
      a. Axicim Concrete Technologies; CATEXOL Cimfilm.
      b. BASF Construction Chemicals – Building Systems; Confilm.
      c. ChemMasters; Spray-Film.
      d. Conspec by Dayton Superior; Aquafilm.
      e. Dayton Superior Corporation; Sure Film (J-74).
      f. Edoco by Dayton Superior; BurkeFilm.
      g. Euclid Chemical Company (The), an RPM company; Eucobar.
      h. Kaufman Products, Inc.; Vapor Aid.
      i. Lambert Corporation; LAMBCO Skin.
      j. L&M Construction Chemicals, Inc.; E-Con.
      k. Meadows, W. R., Inc.; EVAPRE.
      l. Metalcrete Industries; Waterhold.
      m. Nox-Crete Products Group; Monofilm.
      n. Sika Corporation, Inc.; SikaFilm.
      o. SpecChem, LLC; Spec Film.
      p. Symons by Dayton Superior; Finishing Aid.
      q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
      r. Unitex; Pro-Film.
      s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
   1. Products:
      a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
      b. BASF Construction Chemicals – Building Systems; Kure 200.
c. ChemMasters; Safe-Cure Clear.
d. Conspec by Dayton Superior; W.B. Resin Cure.
e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
f. Edoco by Dayton Superior; Res X Cure WB.
g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
i. Lambert Corporation; Aqua Kure-Clear.
j. L&M Construction Chemicals, Inc.; L&M Cure R.
l. Nox-Crete Products Group; Resin Cure E.
m. Right Pointe; Clear Water Resin.
n. SpecChem, LLC; Spec Rez Clear.
o. Symons by Dayton Superior; Resi-Chem Clear.
p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

2.9 RELATED MATERIALS


B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Sleeves and Blockouts: Formed with galvanized metal, galvanized pipe, polyvinyl chloride pipe, fiber tubes, or wood.

F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required; of strength and character to maintain formwork in place while placing concrete

2.10 REPAIR MATERIALS

A. Repair Underlayment: Pre-packaged, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlay: Pre-packaged, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.11 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
   2. The required average strength above specified strength shall be based on the procedure given in the “MIX DESIGN SUBMITTAL FORM” appended to the end of this Specification.
   3. Required average strength above specified strength:
      a. Based on a record of past performance: Determination of required average strength above specified strength shall be based on the standard deviation record of the results of at least 30 consecutive strength tests in accordance with ACI 318, Chapter 5.3 by the larger amount defined by formulas 5-1 and 5-2.
      b. Based on laboratory trial mixtures: Proportions shall be selected on the basis of laboratory trial batches prepared in accordance with ACI 318, Chapter 5.3.3.2 to produce an average strength greater than the specified strength f'c by the amount defined in table 5.3.2.2.
         1) Proportions of ingredients for concrete mixes shall be determined by an independent testing laboratory or qualified concrete supplier.
         2) For each proposed mixture, at least three compressive test cylinders shall be made and tested for strength at the specified age. Additional cylinders may be made for testing for information at earlier ages.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 20 percent.
   2. Combined Fly Ash and Pozzolan: 20 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 1.0 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer’s written instructions.
   1. Do not use admixtures which have not been incorporated and tested in accepted mixes.
   2. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
   3. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
   4. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Proportion normal-weight concrete mixture as indicated on drawings.

2.13 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI’s "Manual of Standard Practice."

2.14 FABRICATION OF EMBEDDED METAL ASSEMBLIES
A. Fabricate metal assemblies in the shop. Holes shall be made by drilling or punching. Holes shall not be made by or enlarged by burning. Welding shall be in accordance with AWS D1.1.

B. Welding of deformed bar anchors and headed stud anchors shall be done by full fusion process equal to that of TRW Nelson Stud Welding Division. A minimum of two headed studs shall be tested at the start of each production period for proper quality control. The studs shall be capable of being bent 45 degrees without failure.

C. Welding of reinforcement shall be done in accordance with AWS D1.4, using the recommended preheat temperature and electrode for the type of reinforcement being welded. Bars larger than no. 9 shall not be welded. Welding shall be subject to the observance and testing of the Testing Laboratory.

D. Metal assemblies exposed to earth, weather or moisture shall be hot dip galvanized. All other metal assemblies shall be either hot dip galvanized or painted with an epoxy paint. Repair galvanizing after welding with a Cold Galvanizing compound installed in accordance with the manufacturer's instructions. Repair painted assemblies after welding with same type of paint.

2.15 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
   1. When air temperature is between 85 and 95 deg F (30 and 35 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 95 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
   1. Vertical alignment:
      a. Lines, surfaces and arises less than 100 feet in height - 1 inch.
      b. Outside corner of exposed corner columns and control joints in concrete exposed to view less than 100 feet in height - 1/2 inch.
      c. Lines, surfaces and arises greater than 100 feet in height - 1/1000 times the height but not more than 6 inches.
      d. Outside corner of exposed corner columns and control joints in concrete exposed to view greater than 100 feet in height - 1/2000 times the height but not more than 3 inches.
   2. Lateral alignment:
      a. Members - 1 inch.
      b. Centerline of openings 12 inches or smaller and edge location of larger openings in slabs - 1/2 inch.
   3. Level alignment:
      a. Elevation of slabs-on-grade - 3/4 inch.
      d. Lintels, sills, parapets, horizontal grooves, and other lines exposed to view - 1/2 inch.
   a. 12 inch dimension or less - plus 3/8 inch to minus 1/4 inch.
   b. Greater than 12 inch to 3 foot dimension - plus 1/2 inch to minus 3/8 inch.
   c. Greater than 3 foot dimension - plus 1 inch to minus 3/4 inch.

5. Relative alignment:
   a. Stairs:
      1) Difference in height between adjacent risers - 1/8 inch.
      2) Difference in width between adjacent treads - 1/4 inch.
      3) Maximum difference in height between risers in a flight of stairs - 3/8 inch.
      4) Maximum difference in width between treads in a flight of stairs - 3/8 inch.
   b. Grooves:
      1) Specified width 2 inches or less - 1/8 inch.
      2) Specified width between 2 inches and 12 inches - 1/4 inch.
   c. Vertical alignment of outside corner of exposed corner columns and control joint grooves in concrete exposed to view - 1/4 inch in 10 feet.
   d. All other conditions - 3/8 inch in 10 feet.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
   1. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Construct formwork to cambers shown or specified on the Drawings to allow for structural deflection of the hardened concrete. Provide additional elevation or camber in formwork as required for anticipated formwork deflections due to weight and pressures of concrete and construction loads.

H. Forms for Exposed Concrete:
   1. Drill forms from the contact face to the outside to suit form ties used. Do not splinter forms by driving ties through improperly prepared holes.
   2. Provide sharp, clean corners at intersecting planes without visible edges or offsets. Back joints with extra studs or girts if required to maintain corners.
   3. Provide extra studs, girts, walers, and bracing to prevent bowing of forms.
   4. Form shapes, recesses and projections with smooth finish materials, and install in forms with sealed joints.
   5. Locate form ties in level horizontal rows, plumbed vertically, and in symmetrical arrangements, unless noted otherwise.

I. Foundation Elements: The sides of all below grade portions of beams, pier caps, walls, and columns shall be formed straight and to the lines and grades specified. Foundation elements shall not be earth formed unless specifically indicated on the Drawings.
J. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

K. Chamfer exterior corners and edges of permanently exposed concrete.

L. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

M. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

N. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

O. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement, anchoring devices, and embedded items.

1. Do not apply form release agent where concrete surfaces are scheduled to receive subsequent finishes which may be affected by agent. Soak contact surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

   a. Spacing within a bolt group: 1/8"
   b. Location of bolt group (center): 1/2"
   c. Rotation of bolt group: 5 degrees
   d. Angle off vertical: 5 degrees
   e. Bolt projection: ± 3/8"

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Formwork supporting conventionally reinforced concrete shall not be removed until concrete has attained 85 percent of its specified 28 day compressive strength as established by tests of field cured cylinders. In the absence of cylinder tests, supporting formwork shall remain in place until the concrete has cured at a temperature of at least 50 degrees Fahrenheit (10 degrees Celsius) for the minimum cumulative time periods given in ACI 347, Section 3.7.2.3. When the surrounding air temperature is below 50 degrees Fahrenheit (10 degrees Celsius), that time period shall be added to the minimum listed time period. Formwork for two-way conventionally reinforced slabs shall remain in place for at
least the minimum cumulative time periods specified for one-way slabs of the same maximum span.

3. Minimum cumulative curing times may be reduced by the use of high-early strength cement or forming systems which allow form removal without disturbing shores, but only after the Contractor has demonstrated to the satisfaction of the Architect that the early removal of forms will not cause excessive sag, distortion or damage to the concrete elements.

4. Wood forms shall be completely removed. Provide temporary openings if required.

5. Provide adequate methods of curing and thermal protection of exposed concrete if forms are removed prior to completion of specified curing time.

6. Areas required to support construction loads in excess of 20 psf shall be shored to properly distribute construction loading. Construction loads up to the rated live load capacity may be placed on unshored construction provided the concrete has attained the specified 28 day compressive strength.

7. Obtaining concrete compressive strength tests for the purposes of form removal shall be the responsibility of the Contractor.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Installation tolerances:

1. Top and bottom bars in slabs and beams:
   a. Members 8" deep or less: ±3/8"
   b. Members more than 8" deep: ±1/2"

2. Concrete Cover to Formed or Finished Surfaces: ±3/8" for members 8" deep or less; ±1/2" for members over 8" deep, except that tolerance for cover shall not exceed 1/3 of the specified cover.

E. Concrete Cover: Refer to the Structural Notes.

F. Splices: Provide standard reinforcement splices by lapping and tying ends. Comply with ACI 318 for minimum lap of spliced bars where not specified on the documents. No. 14 and 18 bars shall not be lap spliced.

G. Field Welding of Embedded Metal Assemblies: All paint and galvanizing shall be removed in areas to receive field welds. All areas where paint or galvanizing has been removed shall be field repaired with the specified paint or cold galvanizing compound, respectively.
H. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

I. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
   2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
   3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
   4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
   5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
   6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, and only if specifically noted as withheld on the batch ticket.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
   2. Water content shall not exceed the maximum specified water/cement ratio for the mix.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
   4. Do not permit concrete to drop freely any distance greater than 20'-0" for concrete containing a high range water reducing admixture (superplasticizer) or 5'-0" for other concrete. Provide chute or tremie to place concrete where longer drops are necessary. Do
not place concrete into excavations with standing water. If place of deposit cannot be poured dry, pour concrete through a tremie with its outlet near the bottom of the place of deposit.

5. Pump priming grout shall be discarded and not used in the structure.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. 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 average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 305.1 and as follows:
   1. Maintain concrete temperature below 95 deg F (32 deg C) at time of placement. 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, and to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
   1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white port-
land cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

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

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floating or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
   1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings or to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
   1. Apply float finish to surfaces indicated to receive a trowel finish or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue traweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
   2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
      a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
   1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

G. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 MISCELLANEOUS CONCRETE ITEMS
A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

1. Housekeeping pads: Concrete fill shall be normal weight concrete (3000 psi), reinforced with 4x4-W2.1xW2.1 welded wire mesh set at middepth of pad. Trowel concrete to a dense, smooth finish. Set anchor bolts for securing mechanical or electrical equipment during pouring of concrete fill.

3.10 INSTALLATION OF NON-SHRINK GROUT UNDER BASEPLATES

A. Grout under all bearing and baseplates. Comply with manufacturer's instructions. Do not dry pack.

B. Mixing: Use a mechanical mixer. Add only enough water to make grout placeable. Do not mix more grout than can be used in 20 minutes. Under no circumstances shall grout be retempered.

3.11 CONCRETE PROTECTING 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 ACI 305.1 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m 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. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

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 (300-mm) 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 (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven
days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
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.
   a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 CONCRETE SURFACE REPAIRS

A. Surface Defects in Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Owner's approval.

B. Contractor shall submit a detailed, descriptive procedure listing proposed pre-packaged repair materials and methods for the repair of surface defects prior to the start of repair work.

C. Patching Mortar: Mix, place and finish pre-packaged repair mortar in accordance with manufacturer's instructions.

D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, minor honeycombs and rock pockets with no exposed reinforcement, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out minor honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than 1 inch (25 mm) in depth. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
   2. Repair defects on surfaces exposed to view using pre-packaged repair mortar so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include minor spalls, pop outs, honeycombs and rock pockets with no exposed reinforcement, crazing and cracks
in excess of 0.01 inch (0.25 mm) wide that do not penetrate to reinforcement, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with patching mortar. Remove defective areas with clean, square cuts, ¼" deep minimum. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Place, compact, and finish patching mortar to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

8. Unapproved and defective repairs shall be removed and replaced in accordance with requirements provided by the Engineer at no additional cost to the Owner.

3.13 STRUCTURAL REPAIRS

A. Structurally Defective Concrete: Structural defects include spalls, honeycombs or rock pockets with exposed reinforcement, hollow-sounding concrete, cracks that penetrate to the reinforcement or completely through concrete elements, inadequate cover over reinforcement, and other conditions that affect the structural performance or durability of the concrete as determined by the Engineer.

B. Repair structural defects in concrete in accordance with plans, specifications, details, etc. provided by the Engineer.

1. The cost of the additional services provided by the Engineer to prepare the repair documents, and to oversee the repair work shall be borne by the Contractor.

C. Unapproved and defective repairs shall be removed and replaced in accordance with requirements provided by the Engineer at no additional cost to the Owner.

3.14 CLEANUP

A. Imperfect or damaged work or any material damaged or determined to be defective before final completion and acceptance of the entire job shall be satisfactorily replaced at the Contractor's expense, and in conformity with all of the requirements of the Drawings and Specifications. Removal and replacement of concrete work shall be done in such manner as not to impair the appearance or strength of the structure in any way.

B. Cleaning: Upon completion of the work all forms, equipment, protective coverings and any rubbish resulting therefrom shall be removed from the site. After sweeping floors, wash floors with clean water. Finished concrete surfaces shall be left in a clean condition, satisfactory to the Owner.
3.15  FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner may engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections may include:
   1. Steel reinforcement placement.
   2. Steel reinforcement welding.
   3. Headed bolts and studs.
   4. Verification of use of required design mixture.
   5. Concrete placement, including conveying and depositing.
   6. Curing procedures and maintenance of curing temperature.
   7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
   5. Compression Test Specimens: ASTM C 31/C 31M.
      a. Cast and laboratory cure four cylinders for each composite sample.
         1) Do not transport field-cast cylinders until they have cured for a minimum of 24 hours.
      b. Cast and field cure four cylinders for each composite sample.
      a. Test one cylinder at 7 days
      b. Test two cylinders at 28 days
      c. Test one cylinder at 56 days
      d. If 4" by 8" cylinders are used, provide 1 additional cylinder at each stage.
   7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
   8. Test results shall be reported in writing to Architect, concrete manufacturer, structural engineer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
   a. When the strength level of the concrete for any portion of the structure, as indicated by cylinder tests, falls below the specified requirements, the Contractor shall provide improved curing conditions and/or adjustments to the mix design as required to obtain the required strength. If the average strength of the laboratory control cylinders falls so low as to be deemed unacceptable, the Contractor shall follow the core test procedure set forth in ACI 301, Chapter 17. Locations of core tests shall be approved by the Architect. Core sampling and testing shall be at Contractor's expense.
   b. If the results of the core tests indicate that the strength of the structure is inadequate, any replacement, load testing, or strengthening as may be ordered by the Architect shall be provided by the Contractor without cost to the Owner.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

12. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

13. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.
MIX DESIGN SUBMITTAL FORM

Project: _______________________________________________________________

Method used to select proportions (ACI 318, Sect. 5.3):

___ field experience or ___ trial mixture

Person that prepared the submittal: ______________________________________

Signed: ______________________ Date: ______________

Person selecting the mixture proportions: ____________________________________

Ready-Mix Supplier Company: ____________________________________________

Contact Person: ___________ Phone Number: ___________ Date: _____________

Main Plant Location: ______________________________ Miles from Project: ___

Secondary Plant Location: __________________________ Miles from Project: ___

SELECTION OF CONCRETE MIX PROPORTIONS

1. CEMENTITIOUS MATERIALS

Cement: ___(lbs) ___(cu.ft.) Type: _____ Source: ________ Manufacturer _______

Fly Ash: ___(lbs) ___(cu.ft.) Type: _____ Source: ________ Manufacturer _______

Other: ___(lbs) ___(cu.ft.) Type: _____ Source: _______ Manufacturer ________

Fly ash replacement: ______ %

2. AGGREGATES

Fine: ___(lbs) ___(cu.ft.) Size: ________ Type: _______ Source: ____________

Coarse: ___(lbs) ___(cu.ft.) Size: _______ Type: _______ Source: ____________

Total: ___(lbs) ___(cu.ft.) Size: ________ Type: _______ Source: ____________

3. WATER

Water: ___(lbs) ___(cu.ft.) Source: _______________________

4. ADMIXTURES

HRWR_________ oz. per 100# cement dosage range

Non-Corrosive Accelerator ________ oz. per 100# Cement

W.R.___________ oz. per 100# Cement

A.E.A.___________ oz. per 100# Cement

Fibers or color pigments or other additions_______________ oz. per 100# Cement

FRESHLY MIXED CONCRETE PROPERTIES

Slump before additive = _________ in. Air Content = _____________ %

Final Slump after additive = _________ in. Unit Dry Wt. = ______________ pcf

Unit Wet Wt. = __________ pcf

Placement Method = ____________________________

Administrative Upgrades at 03 33 00 - 21 CAST-IN-PLACE CONCRETE
Adams Hill Elementary School
Northside ISD
DOCUMENTATION OF COMPRESSION STRENGTH AND REQUIRED STRENGTH ON THE BASIS OF FIELD EXPERIENCE

Check one, complete blanks and attach historical data used for these calculations:

- Records attached represent 30 or more consecutive, recent tests of concrete within 1000 psi of the required, which was produced with similar materials and procedures, and under similar conditions, per ACI 318, paragraph 5.3.1.
  \[ S = \ldots, \quad f'c = \ldots, \quad f'cr = \ldots, \quad f'(c\text{avg}) = \ldots \]

- Records attached represent two groups totaling 30 or more consecutive, recent tests of concrete within 1000 psi of the required, which was produced with similar materials and procedures, and under similar conditions, per ACI 318, paragraph 5.3.1
  \[ S(avg) = \ldots, \quad f'c = \ldots, \quad f'cr = \ldots, \quad f'(c\text{avg}) = \ldots \]

- Records attached represent 15-29 consecutive, recent tests of concrete within 1000 psi of the required, which was produced with similar materials and procedures, and under similar conditions per ACI 318, paragraph 5.3.1.2, spanning a period of not less than 45 days.
  \[ S(mod) = \ldots, \quad f'c = \ldots, \quad f'cr = \ldots, \quad f'(c\text{avg}) = \ldots \]

- Records attached represent 10-15 recent tests of concrete with similar materials and conditions, per ACI 318, paragraphs 5.3.2.2 and 5.3.3.1, spanning a period of not less than 45 days.
  \[ f'c = \ldots, \quad f'cr = \ldots, \quad f'(c\text{avg}) = \ldots \]

DOCUMENTATION OF COMPRESSION STRENGTH AND REQUIRED STRENGTH ON THE BASIS OF TRIAL MIXTURES

<table>
<thead>
<tr>
<th>Age (days)</th>
<th>Mix #1 (f’c – W/C ratio)</th>
<th>Mix #2 (f’c – W/C ratio)</th>
<th>Mix #3 (f’c – W/C ratio)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
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</tbody>
</table>

Attach a water cement ratio vs. f’c graph.
Show W/C ratio selected based on f’c & f’cr from T5.3.2.2
Show mix design proportioned to achieve f’cr = f’c + 1200 psi (1400 psi for strength higher than 5000 psi at 28 days)

ATTACHMENTS
- Manufacturer’s certification of cement materials
- Grading chart of Aggregate
- Admixture certification
- Water cement ratio vs. f’c graph
- Past performance record submittal

END OF SECTION
SECTION 04 01 20
UNIT MASONRY CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cleaning of existing masonry surfaces in preparation for new masonry Work; replacement of damaged brick units with new brick and recovered brick; and repointing existing mortar joints.

1. Refer to drawings for locations.

1.2 SUBMITTALS

A. Product Data:
   1. Submit data on cleaning compounds and cleaning solutions.
   2. Submit manufacturer’s technical data for each product indicated, including recommendations for their application and use; include test reports and certifications substantiating that products comply with requirements.

B. Representative of the cleaning agent manufacturer and restoration subcontractor shall visit the site and submit a written restoration plan and restorer’s step-by-step written instructions tailored specifically for this Project.
   1. Submit written plan of procedures and materials to be used in complying with this Section, including written description of cleaning methods, spray working pressures, materials and equipment proposed for use in cleaning each type of masonry.
   2. Elaborate on methods to be used to assure safety of building occupants and visitors to site; disposal plan including location of approved disposal site; and detailed description of methods to be employed to control pollution.

1.3 QUALITY ASSURANCE

A. Performance Requirements: Perform Work in accordance with MSJC Code and MSJC Specification.

B. Qualifications: Company specializing in manufacturing products specified in this Section with minimum five years experience.
   1. Manufacturer shall be capable of providing field service representation during construction and approving application method(s).
   2. Installer: Company specializing in performing Work of this Section with minimum five years documented experience.

1.4 PROJECT CONDITIONS

A. Environmental Requirements - Cleaning Operations:
   1. Do not apply at surface and air temperatures below 40 degrees F or above 95 degrees F unless otherwise indicated by manufacturer’s written instructions.
   2. Do not apply when surface and air temperatures are not expected to remain above 40 degrees F for a minimum of eight hours after application, unless otherwise indicated by manufacturer’s written instructions.
   3. Do not apply under windy conditions, which would cause cleaning products or protective treatments to be blown onto adjacent unprotected surfaces.
4. Do not apply to frozen substrate; allow adequate time for substrate to thaw, if freezing conditions exist before application. 5. Do not apply consolidation or protective treatments earlier than 24 hours after rain or if rain is predicted for a period of 6 hours after application, unless otherwise indicated by manufacturer's written instructions.

B. Dispose of run-off from cleaning operations by legal means and in a manner which prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

1.5 SEQUENCING

A. Provide masonry restoration and cleaning materials and other construction in ample time to complete Work in a timely manner.

B. Perform repointing before cleaning masonry surfaces.

PART 2 - PRODUCTS

2.1 MASONRY RESTORATION AND CLEANING

A. Cleaner Manufacturers:
   1. PROSOCO, Inc.
   2. Diedrich Chemicals Restoration Technology.

2.2 COMPONENTS - EXTERIOR RESTORATION AND CLEANING

A. Restoration Cleaner - Brickwork: Clear liquid; 1.050 specific gravity; no flash point; 3.0 pH (at 1.5 dilution); 8.75 lbs. wt./gal.
   1. Basis-of-Design: Sure Klean Restoration Cleaner or Sure Klean Heavy Duty Restoration Cleaner by PROSOCO, Inc.

B. Restoration Cleaner - Cast Stone: Clear liquid; 1.12 specific gravity; no flash point; 1.5-2.0 pH.

C. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts and organic matter.

D. Brushes: Fiber bristle only.

E. Mortar and Grout Materials: ASTM C270.
   1. Mortar strength shall not exceed strength in existing masonry construction.
   2. Tuck pointing mortar shall not be denser than original mortar; tuck pointing mortar shall be prehydrated.
   3. Color match to existing mortar.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify surfaces to be cleaned and restored are ready for Work of this Section.
   1. Clean substrates of substances that interfere with penetration or performance of surface treatments.
   2. Test for moisture content and pH level, according to manufacturer’s instructions, to ensure surface is prepared and dry to receive surface treatments.
B. Protect elements surrounding Work of this Section from damage or disfiguration.

C. Immediately remove stains, efflorescence, or other excess resulting from Work of this Section.

D. Protect roof membrane and flashings from damage; lay 1/2 inch plywood on roof surfaces over full extent of work area and traffic route.

E. Protection:
   1. Close off, seal, mask and board up areas, landscaping, materials and surfaces not receiving Work of this Section to protect from damage.
   2. Protect persons and motor vehicles surrounding building whose masonry surfaces are being restored and surrounding buildings from injury resulting from masonry restoration Work.
   3. Protect glass, unpainted metal trim and polished stone from contact with acidic chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape; apply masking agent to comply with manufacturer’s recommendations; do not apply liquid masking agent to painted or porous surfaces.
   4. Protect unpainted metal from contact with alkali chemical cleaners by covering them either with liquid strippable masking agent or polyethylene film and waterproof masking tape. F. Construct dust proof and weatherproof partitions to close off occupied areas.

3.2 EXTERIOR CLEANING

A. Cleaning Existing Exterior Masonry:
   1. Restoration Cleaning:
      a. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.
      b. Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.
      c. Brush coat brick masonry with restoration cleaner, mixed into solution identical to solution required for sample area.
      d. Provide second application when required by preliminary test of sample area.
      e. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.
      f. Rinse from bottom up with potable water applied at 400 to 600 psi and at rate of 4 gallons per minute; older, more delicate masonry may require restricting water pressure to avoid damage.
   2. Cleaning New Masonry: Refer to Section 04 20 00.

3.3 MISCELLANEOUS WORK

A. Clean all exterior glass, door and storefront frames.

END OF SECTION
SECTION 04 05 00
MASONRY MORTAR AND GROUT

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes mortar and grout for masonry.
B. Related Sections:
   1. Section 04 05 23 – Adjustable Concealed Lintel System.
   2. Section 04 20 00 – Unit Masonry Assemblies: Installation of mortar and grout.
   3. Section 08 12 00 – Standard Steel Frames: Grouting steel door frames.

1.2 REFERENCES
A. ASTM International:
   1. ASTM C143 – Slump of Hydraulic Cement Concrete.
   2. ASTM C144 - Aggregate for Masonry Mortar.
   3. ASTM C150 - Portland Cement.
   5. ASTM C270 - Mortar for Unit Masonry.
   7. ASTM C476 - Grout for Masonry.
   8. ASTM C780 - Test Method for Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
B. The Masonry Society:
   1. TMS MSJC - Building Code for Masonry Structures (ACI 530/ASCE 5/TMS 402), Specification for Masonry Structures (ACI 530.1/ASCE 6/TMS 602) and Commentaries.

1.3 SUBMITTALS
A. Section 01 33 00 – Submittal Procedures: Submittal procedures.
B. Samples: Submit two samples of mortar, illustrating mortar color and color range.
C. Design Data: Submit design mix when the Proportion specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.
D. Test Reports:
   1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 and test and evaluation reports to ASTM C780 for aggregate ratio and water content, air content, consistency and compressive strength.
   2. Submit reports on grout indicating conformance of grout to property requirements of ASTM C476 and test and evaluation reports to ASTM C1019.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
1.4 QUALITY ASSURANCE

A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.

B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 ENVIRONMENTAL REQUIREMENTS

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


PART 2 - PRODUCTS

2.1 MORTAR AND MASONRY GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I, White color as required to achieve coloration acceptable to Architect.

B. Mortar Aggregate: ASTM C144, standard masonry type.

C. Hydrated Lime: ASTM C207, Type S.

D. Grout Aggregate: ASTM C404, fine and coarse.

E. Water: Clean and potable.

F. Plasticizer: Water reducing type, if recommended by Testing Laboratory.

G. Bonding Agent: Latex type.

2.2 MIXES

A. Mortar Mixes:

1. Mortar For Non-Structural Masonry: ASTM C270, Type N using the Proportion specification consisting of the following:
   a. 1 part Portland cement.
   b. 1 part lime.
   c. 6 parts washed sand.
   d. Compressive Strength: 750 psi at 28 days.

2. Pointing Mortar: ASTM C270, Type N using the Proportion specification.

B. Mortar Mixing:

1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

2. Achieve uniformly damp sand immediately before the mixing process.

3. Add admixtures if recommended by Testing Laboratory, in accordance with manufacturer’s instructions. Provide uniformity of mix and coloration.

4. Do not use anti-freeze compounds to lower the freezing point of mortar.

5. If water is lost by evaporation, re-temper only within two hours of mixing.

6. Use mortar within two hours after mixing at temperatures of 90 degrees F (32 degrees C), or 2-1/2 hours at temperatures under 50 degrees F.
C. Grout Mixes: Grout for Bond Beams, Lintels, Fill Cores and Jambs: 3,000 psi strength at 28 days; 8-10 inches slump; mixed in accordance with ASTM C476 Fine grout.

D. Grout Mixing:
1. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476.
2. Add admixtures in accordance with manufacturer’s instructions; mix uniformly.
3. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Section 01 40 00 – Quality Control: Coordination and project conditions.
B. Request inspection of spaces to be grouted.

3.2 PREPARATION
A. Apply bonding agent to existing concrete surfaces.
B. Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

3.3 INSTALLATION
A. Install mortar and grout in accordance with ASTM C270 and requirements of Section 04810.
B. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength.
C. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength and in accordance with ASTM C143 for slump.

END OF SECTION
SECTION 04 05 23
ADJUSTABLE CONCEALED LINTEL SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Engineered, adjustable concealed lintel system and accessories, including spine system with mid-support if needed to meet system performance.

B. Steel plates, brackets and bolted assembly with anchors for placement in masonry work.

1.2 RELATED REQUIREMENTS

A. Related Sections:
   1. Section 04 05 00 – Masonry Mortar and Grout: Product Requirements for mortar and grout.
   2. Section 04 20 00 – Unit Masonry Assemblies.
   3. Section 04 72 00 - Cast Stone.
   4. Section 05 12 00 – Structural Steel; framing and mounting channels.
   5. Section 05 55 00 – Metal Fabrications; miscellaneous steel framing members
   7. Section 07 65 00 – Thru-Wall Flexible Flashing and Drainage System
   8. Section 07 92 00 – Joint Sealants: Rod and sealant at control and expansion joints.

1.3 REFERENCE STANDARDS


1.4 SYSTEM DESCRIPTION

A. Concealed Lintel Assembly: Provide engineered lintel assembly to support the brick soffits indicated on Drawings with no deflection or cracking of the brick soffit assembly.
1.5 COORDINATION

A. Coordinate the Work with installation of component assembly into masonry components without interfering with masonry reinforcement.

B. Coordinate welding in accordance with AWS B2.1/B2.1M for concealed lintel manufacturer’s mounting and framing channels; provide mid-span support where required to meet performance for deflection.

1.6 PREINSTALLATION MEETINGS

A. Convene pre-installation meeting 2 weeks before start of work of this section.

B. Require attendance of parties directly affecting work of this section, including Contractor, Architect, Engineer, installer, and manufacturer’s representative.

C. Review materials, preparation, installation, tolerances, protection, and coordination with other work.

1.7 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit manufacturer’s product data, including installation instructions.

C. Shop Drawings:
   1. Submit manufacturer’s shop drawings, indicating component profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   2. Indicate welded connections using standard welding symbols.
   3. Indicate net weld lengths.

D. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.

E. Design Data: Submit manufacturer’s design data, including structural calculations, signed and sealed by qualified professional engineer registered in State of Texas.

F. Warranty Documentation: Submit manufacturer’s standard warranty.

1.8 QUALITY ASSURANCE

A. Manufacturer’s Qualifications:
   1. Capable of providing field service representation during installation.
   2. Minimum of 5 years of experience in manufacture of adjustable concealed lintel system for masonry.
   3. Experience in projects of similar scope.
   4. Manufacture in accordance with established quality assurance program.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
1. Store and handle materials in accordance with manufacturer’s instructions.
2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
3. Store materials in clean, dry area indoors.
4. Protect materials and finish during storage, handling, and installation to prevent damage.

PART 2 - PRODUCTS

2.1 MANUFACTURER


C. Substitutions: Section 01 60 00 - Product Requirements.

2.2 DESIGN CRITERIA

A. Concealed Lintel Assembly: Lintel shall resist loads as follows without damage or permanent set to components or masonry:
   1. Brick Veneer Height: 6 ft above lintel span.
   2. Additional Distributed Load: As shown on Drawings.

2.3 MATERIALS

A. Adjustable Concealed Lintel System for Masonry: Concealed Lintel Spines / Horseshoe Plates / Stitching Rods/ Mid-span Support (if required as part of engineered system):
   Structural carbon steel, ASTM A36, hot-dip galvanized to ASTM A123 or A153 as applicable.

2.4 FABRICATION

A. Fabricate components to design required and provide for site-required adjustments.

B. Weld and grind components flush and smooth with adjacent finish surface.
   1. Make exposed joints butt tight, flush, and hairline.
   2. Ease exposed edges to small uniform radius.

C. Weld components indicated on shop drawings.

2.5 FINISHES

A. Structural Carbon Steel Components and Anchors: Hot-dip galvanized after fabrication, ASTM A123.

B. Stainless Steel: Mill-produced finish.
PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine areas and supports to receive adjustable concealed lintel system.
B. Verify dimensions, tolerances, and method of attachment with other work.
C. Notify Architect of conditions that would adversely affect installation.
D. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION
A. Supply items required to be placed in masonry with setting templates to appropriate sections.

3.3 INSTALLATION
A. Install adjustable concealed lintel system in accordance with manufacturer’s instructions at locations indicated on the Drawings.
B. Install items plumb and level, accurately fitted, free from distortion or defects.
C. Adjust components to suit site conditions.
D. Provide formwork for placement in masonry to maintain true alignment until completion of permanent attachment.
E. Obtain approval from Architect and manufacturer before site cutting or making adjustments not scheduled.
F. Perform field welding in accordance with AWS D1.1/D1.1M where necessary using certified welders.

3.4 TOLERANCES
A. Maximum Variation from Level: 1/4 inch.

3.5 PROTECTION
A. Protect installed adjustable concealed lintel system from damage during construction.
B. Touch-up damage to factory-applied finishes using appropriate materials and techniques.

END OF SECTION
SECTION 04 20 00
UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes face brick, concrete masonry units; reinforcement, anchorage, and accessories.

B. Related Sections:
   1. Section 04 05 00 – Masonry Mortar and Grout: Product Requirements for mortar and grout.
   2. Section 04 05 23 – Adjustable Concealed Lintel System.
   3. Section 04 72 00 - Cast Stone.
   4. Section 07 27 20 – Fluid Applied Liquid Air Barrier.
   5. Section 07 62 00 – Flashing and Sheet Metal: Product requirements for reglets for flashings for placement by this section.
   6. Section 07 65 00 – Thru-Wall Flexible Flashing and Drainage System
   7. Section 07 84 00 - Firestopping
   8. Section 07 92 00 – Joint Sealants: Rod and sealant at control and expansion joints.
   9. Section 09 91 00 – Painting.

1.2 REFERENCES

A. ASTM International:
   5. ASTM A666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   8. ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units.
   9. ASTM C140/C140M – Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

B. The Masonry Society:

1.3 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures: Submittal procedures.
B. Product Data: Submit data for masonry units and fabricated wire reinforcement, anchors, ties, flashings, joint materials and other accessories.

C. Samples: Submit four samples of face brick for each type of unit scheduled to illustrate color, texture and extremes of color range.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with TMS 402/602.

B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

C. Periodic Inspections: Throughout construction involving masonry cavities, Contractor shall conduct periodic inspections and maintain photographic record of cavities to ensure that clean cavities remain at the completion of the Work.

1.5 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 PRE-INSTALLATION MEETINGS

A. Section 01 33 00 - Submittals: Pre-installation meeting.

B. Convene minimum one week prior to commencing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 – Material and Equipment: Product storage and handling requirements.

B. Accept units on site. Inspect for damage.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 – Material and Equipment.


1.9 COORDINATION

A. Section 01 33 00 - Submittals: Coordination and project conditions.

B. Coordinate masonry work with installation of window and door anchors.

PART 2 - PRODUCTS

2.1 UNIT MASONRY ASSEMBLIES

A. Manufacturer:
   1. Acme Brick Co. (Basis of Design)
   2. Hanson Brick
   3. Hebron Brick
   4. Interstate Brick
   5. Substitutions: Section 01 60 00 - Product Requirements.
2.2 COMPONENTS

A. Face Brick (Color A): ASTM C652, Type HBS, Heritage texture.
   1. Brick Size and Shape: Nominal king size of 2 5/8 x 3 x 9 5/8 inches.
   2. Model/Color: Acme Blend ELP 130 Americana, as produced at the Elgin Plant; color and blend to match existing brick on campus.

B. Face Brick (Color B): ASTM C652, Type HBS, Heritage texture.
   1. Brick Size and Shape: Nominal king size of 2 5/8 x 3 x 9 5/8 inches.
   2. Model/Color: Acme Blend #50 Glacier White, as produced at the Perla Plant, or approved equal.

C. Building Brick: ASTM C62, Grade NW; solid units.

D. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90, Type I - Moisture Controlled; medium weight.
   1. Concrete Masonry Unit Size and Shape: Nominal modular size of 8 by 8 by 16 inches. Furnish special units for 90 degree corners, bond beams, lintels, coved base, and bullnosed corners.

2.3 ACCESSORIES

A. Single Wythe Joint Reinforcement: Truss type; steel wire, galvanized to ASTM A153/A153M-B2 (1.5 oz./ft²), 0.148 inch diameter side rods with 0.148 inch diameter cross ties.
   1. H&B #120 Truss Mesh or approved equal.

B. Multiple Wythe Joint Reinforcement: Truss type; adjustable type, steel wire, hot dip galvanized to ASTM A153/A153M Class B2 (1.50 oz./ft²), 0.148 inch diameter side rods with 0.148 inch diameter cross ties; 0.188 inch diameter eye and pintle.
   1. H&B #170-2 Lox-All or approved equal.

C. Column Ties Reinforcement: Weld-on type; cold-drawn steel wire conforming to ASTM A1064/A1064M, tensile strength of 80,000 p.s.i; yield point - 70,000 psi minimum; 3/16 inch diameter, hot-dip galvanized after fabrication to ASTM A153/A153M-B2 (1.5 oz/ft²); length as required for cavity depth shown on drawings.
   1. H&B Vee-Byn-Tie or approved equal
   2. H&B Series 359 Weld-on Ties, type appropriate to suit application, or approved equal.

D. Veneer Anchor Plate Reinforcement: Adjustable; wire and backplate finish shall be hot dip galvanized to ASTM A153/A153M Class B2 (1.50 oz./ft²); embedded portion of the 2X-Hook shall be 3/16 inch diameter round wire.
   1. H&B #213-2X or approved equal
   2. Backplate shall be equal to thickness of insulation.

E. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.


H. Dovetail Anchors: Bent steel strap, 1 inch by 12 gauge thick, galvanized to ASTM A153/A153M B2 finish; 3/16 inch vee wall tie x length required. Verify compatibility with anchor slot. H&B #315 or approved equal.

I. Beam Anchors: 1-1/4 inches wide by 12 gauge thick by length required to suit condition; galvanized to ASTM A153/A153M B2 finish. H&B #357 or approved equal.

J. Mesh Wall Ties: ASTM A 185; 1/2 inch square mesh by 16 gauge, galvanized.

K. Anchor Bolts: Headed, J-shaped or L-shaped.

L. Mortar and Grout: As specified in Section 04 05 00.

M. Flashings: As specified in Section 07 62 00.

N. Joint Filler: Closed cell polyethylene rubber; oversized 50 percent to joint width; self expanding; provide in maximum lengths.

O. Building Paper: ASTM D226, No. 15 asphalt saturated felt.

P. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.

Q. Weeps: Open head joints full height of brick course.

R. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials. Sure Klean 600 Detergent, manufactured by ProSoCo. For special stain problems, use stronger specific cleaners by ProSoCo for each cleaning problem.

S. Steel Lintels: As specified in Section 05 50 00, hot-dip galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: coordination and project conditions.

B. Verify field conditions are acceptable and are ready to receive work.

C. Verify items provided by other sections of work are properly sized and located.

D. Verify built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other sections.

B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

3.3 INSTALLATION

A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Closely inspect units as they are laid. Units with chipped corners, rough or warped faces, coarse surfaces, or walls with varying coarse and fine textures will not be acceptable.

C. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.

D. Coursing of Concrete Masonry Units:
1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 16 inches.
3. Mortar Joints: Concave where exposed; flush at cavity walls and surfaces to receive ceramic tile.

E. Coursing of Brick Units – Standard King size:
1. Bond: Running as indicated on Drawings.
   a. Provide soldier and rowlock courses where indicated.
2. Coursing: Four units and four mortar joints to equal 12 inches.

F. Placing and Bonding:
1. Lay solid masonry units in full bed of mortar, with full head joints.
2. Lay hollow masonry units with face shell bedding on head and bed joints.
3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
4. Excess mortar shall be struck continuously from the back of the brick veneer removed from the cavity as work progresses.
5. Interlock intersections and external corners at running bonds.
6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
7. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
8. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive is applied or bitumen dampproofing is applied.
9. Isolate masonry from vertical structural framing members with SBS type flashing. Extend flashing 6 inches on each side of joint.
10. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler. Cover with SBS type flashing at exterior side of cavity walls. Extend flashing 6 inches on each side of joint.

G. Weeps and Vents: Furnish weeps and vents in outer wythe at 30 inches on center horizontally, above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

H. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Provide mortar dropping collection netting in accordance with Section 04 05 23. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor barrier adhesive.

I. Joint Reinforcement And Anchorage - Single Wythe Masonry:
1. Install horizontal joint reinforcement 16 inches on center.
2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
3. Place joint reinforcement continuous in first and second joint below top of walls.
4. Lap joint reinforcement ends minimum 6 inches.
5. Reinforce joint corners and intersections with strap anchors 16 inches on center.
J. Joint Reinforcement and Anchorage - Masonry Veneer:
1. Install horizontal joint reinforcement 16 inches on center.
2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
3. Place joint reinforcement continuous in first and second joint below top of walls.
4. Lap joint reinforcement ends minimum 6 inches.
5. Embed wall ties in masonry backing to bond veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings.
6. Secure wall anchors to stud framed backing and embed into masonry veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings. Secure wall anchors to studs with two stainless steel fasteners per attachment.
7. Reinforce stacked bonded joint corners and intersections with strap anchors 16 inches on center.

K. Joint Reinforcement and Anchorages - Cavity Wall Masonry and Multiple Wythe Unit Masonry:
1. Install horizontal joint reinforcement 16 inches on center.
2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
3. Place joint reinforcement continuous in first and second joint below top of walls.
4. Lap joint reinforcement ends minimum 6 inches.
5. Engage anchors into reglets in concrete. Attach to structural steel members. Embed anchorages in every second block or sixth brick joint.
6. Reinforce stack bonded unit joint corners and intersections with strap anchor 16 inches on center.

L. Masonry Flashings: Refer to Section 07 62 00.
1. Extend flashing horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels, at bottom of walls, around door, window, and louver openings, under parapet caps, junctures with structural columns and beams, and above counterflashings.
2. Turn flashing up minimum 8 inches and bed into mortar joint of masonry, seal to concrete, or seal to sheathing over steel stud framed backing.
3. Lap end joints minimum 6 inches and seal watertight.
4. Turn flashing, fold, and seal at corners, bends, and interruptions.

M. Lintels:
1. Install steel lintels over openings.
2. Install reinforced unit masonry lintels over openings where steel concrete lintels are not scheduled or indicated.
3. Openings Up To 42 inches Wide: Place two, No. 4 reinforcing bars 1 inch from bottom web.
4. Openings From 42 inches Up To 78 inches Wide: Place two, No. 5 reinforcing bars 1 inch from bottom web.
5. Openings Over 78 inches: Reinforce openings as indicated on Drawings.
6. Do not splice reinforcing bars.
7. Support and secure reinforcing bars from displacement.
8. Place and consolidate grout fill without displacing reinforcing.
9. Allow masonry lintels to attain specified strength before removing temporary supports.
10. Maintain minimum 6 inch bearing on each side of opening.
N. Grouted Components:
1. Reinforce bond beam with 2, No. 4 bars, 1 inch from bottom web.
2. Lap splices bar diameters required by code.
3. Support and secure reinforcing bars from displacement.
4. Place and consolidate grout fill without displacing reinforcing.
5. At bearing locations, fill masonry cores with grout for minimum 12 inches both sides of opening.

O. Reinforced Masonry:
1. Lay masonry units with cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
2. Place reinforcement bars as indicated on Drawings.
3. Splice reinforcement in accordance with Section 03 20 00.
4. Support and secure reinforcement from displacement.
5. Place and consolidate grout fill without displacing reinforcing.
6. Place grout in accordance with TMS 402/602.

P. Control and Expansion Joints:
1. Provide control and expansion joints where indicated on Drawings. Where not indicated, masonry walls shall not exceed 25 ft in length without a joint.
2. Do not continue horizontal joint reinforcement through control and expansion joints.
3. Size control joint in accordance with Section 07 92 00 for sealant performance.
4. Form expansion joint by omitting mortar and cutting unit to form open space.
5. Fill joint with closed cell foam backer rod and finish with sealant of color to match adjacent surface.

Q. Built-In Work:
1. As work progresses, install built-in metal door frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
2. Install built-in items plumb and level.
3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
4. Do not build in materials subject to deterioration.

R. Cutting And Fitting:
1. Cut and fit for chases, pipes, conduit, sleeves, grounds, electrical boxes, toilet accessories and fire cabinets. Coordinate with other sections of work to provide correct size, shape, and location.
2. Obtain Architect/Engineer’s approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Control: Tolerances.

B. Maximum Variation From Alignment of Columns: 1/4 inch.

C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

G. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

I. Maximum Variation for Steel Reinforcement:
   1. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
   2. Plus or minus 1 inch when distance is between 8 and 24 inches.
   3. Plus or minus 1 1/4 inch when distance is greater than 24 inches.
   4. Plus or minus 2 inches from location along face of wall.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control: Testing and Inspection Services.

3.6 CLEANING

A. Section 01 77 00 – Project Closeout: Final cleaning.

B. Remove excess mortar and mortar smears as work progresses.

C. Replace defective mortar. Match adjacent work.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operations.

END OF SECTION
SECTION 04 72 00
CAST STONE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cast stone copings and caps.
   2. Anchors and supports.
   3. Accessories.

B. Related Sections:
   1. Section 04 05 00 - Masonry Mortar and Grout: Mortar for setting cast stone units.
   2. Section 04 05 23 – Adjustable Concealed Lintel System.
   3. Section 04 22 00 - Unit Masonry Assemblies: Backup for cast stone veneer.
   4. Section 07 27 20 - Fluid Applied Liquid Air Barrier.
   5. Section 07 65 00 - Thru-Wall Flexible Flashing and Drainage System.
   6. Section 07 62 00 - Flashing and Sheet Metal.
   7. Section 07 92 00 - Joint Sealers: Rod and sealant at control and exposed top joints.

1.2 REFERENCES

A. American Society of Civil Engineers:

B. ASTM International:
   3. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   7. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in

C. The Masonry Society:
   1. TMS MSJC - Building Code for Masonry Structures (ACI 530/ASCE 5/TMS 402),
      Specification for Masonry Structures (ACI 530.1/ASCE 6/TMS 602) and Commentaries.

1.3 DESIGN REQUIREMENTS

A. Wind Loads: Design anchors to withstand positive and negative wind loads acting normal to plane of wall, including increased loads at building corners.
   1. Design Wind Load: To design pressure of 20 psf
1.4 SUBMITTALS

A. Section 01 30 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:
   1. Indicate cast stone layout, profiles, cross-sections, reinforcement, exposed faces, joint arrangement, anchoring methods, anchors.
   2. Indicate cast stone types and location.

C. Product Data: Submit data for cast stone units, wall ties, anchors, and other accessories.

D. Samples:
   1. Submit two of each cast stone item, 6 x 6 inches in size illustrating profiles, finish, texture and color range.
   2. Submit two of each anchor and illustrating material, configuration, and finish.

E. Test Reports: Indicate concrete mix design compressive strength and water absorption.

F. Manufacturer's Installation Instructions: Submit instructions for anchor attachment, cast stone cleaning, and special Project installation conditions.

G. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.


1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Coordinate work of this section with Sections 04 05 00 and 04 22 00. Convene minimum one week prior to commencing.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept cast stone on site in manufacturer’s protective packaging. Inspect for damage.

C. Store cast stone on site covered and elevated above grade. Protect cast stone from damage, soiling, and staining.

D. Provide ventilation to prevent condensation from forming on cast stone.
1.9 ENVIRONMENTAL REQUIREMENTS
A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

1.10 FIELD MEASUREMENTS
A. Verify field measurements prior to fabrication.

1.11 COORDINATION
A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
B. Coordinate cast stone work with masonry work.

PART 2 - PRODUCTS

2.1 CAST STONE
A. Manufacturers:
   1. Pyramid Stone Company.
   2. Substitutions: Section 01 60 00 - Product Requirements.
B. Product Description: ASTM C1364, architectural cast stone units fabricated by either dry casting or wet casting methods, with fine grained texture, simulating natural cut stone. The methods used for casting cast stone units shall be the option of the Contractor. The procedures shall be such that they produce a consistently uniform homogeneous cast stone which has a consistent character in color and texture. Concrete shall be mixed with identical materials and proportioning for each batch, placed and thoroughly compacted. Cast stone units accurately to the shapes and dimensions indicated on the drawings and shown on approved shop drawings. Provide exposed faces having true planes and with true, sharp arises. Provide wash or slope for drainage on exposed top surfaces.
C. Color and Finish: Match sample on file with Architect.

2.2 COMPONENTS
A. Portland Cement: ASTM C150, Type I – Normal, white color.
B. Coarse Aggregates: ASTM C33, except grading requirements; granite, quartz or limestone.
C. Fine Aggregates: ASTM C33, except grading requirements; manufactured or natural sand.
D. Colors: ASTM C979; inorganic iron oxide pigments.
E. Admixtures: ASTM C494/C494M.
F. Fly Ash: ASTM C618.
G. Water: Potable.
H. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, galvanized finish.

2.3 ACCESSORIES
A. Wall Ties: Formed steel wire, 9 gage thick, eye and pintle type, hot dip galvanized to ASTM A153/A153M finish.
B. Mortar: As specified in Section 04 05 00.
C. Flashings: As specified in Section 07 62 00.
D. Cleaning Solution: Non-acidic, not harmful to cast stone work or adjacent materials.

2.4 MIXES
A. Concrete Mix:
   1. Compressive Strength: ASTM C1194; minimum 6,500 psi at 28 days.
   2. Slump: No measurable slump when dry casting is used.
   3. Absorption: ASTM C1195; maximum 6 percent for cold water and 10 percent for boiling water at 28 days.

2.5 FABRICATION
A. Thickness: As shown on Drawings.
B. Length: 48 inch maximum.
C. Use rigid molds, constructed to maintain cast stone units uniform in shape, size, and finish.
D. Form units to length required for joint layout indicated on Drawings. Field cutting to length is not permitted.
E. Reinforce units in accordance with ASTM C1364 for safe handling and as indicated on shop drawings to resist structural loads.
   1. Use galvanized finished reinforcing when concrete cover over reinforcing is less than 1-1/2 inches thick, including end conditions.
F. Embed anchors and other cast-in items.
G. Form external corners to square joint profile.
H. Slope exposed top surfaces of horizontal coping for natural wash as indicated on Drawings.
I. Form drip slot in bottom surface of exterior units as indicated on Drawings. Size slot not less than 3/8 inch wide and 1/4 inch deep; full width of projection.
J. Curing: Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
K. Acid etch exposed-to-view surfaces to remove cement film and achieve uniform appearance.
2.6 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Maintain plant records and quality control program during production of cast stone units. Make records available upon request.

C. Analyze three random specimens for each 500 cubic feet of fabricated cast stone units:
   1. Compressive Strength: In accordance with ASTM C1194.
   2. Cold Water Absorption: In accordance with ASTM C1195.

D. Inspect and for color variation.

E. Visually inspect color differences between fabricated units and approved sample in accordance with ASTM D1729.

F. Make completed cast stone available for inspection at manufacturer’s factory prior to packaging for shipment. Notify Owner at least seven days before inspection is allowed.

G. Allow witnessing of factory inspections and test at manufacturer’s test facility. Notify Owner at least seven days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify field conditions are acceptable and are ready to receive work.

C. Verify items provided by other sections of work are properly sized and located.

3.2 PREPARATION

A. Coordinate installation of anchors furnished to other sections.

B. Provide for erection procedures and induced loads during erection. Furnish temporary bracing during installation. Maintain temporary bracing in place until final support is provided.

3.3 INSTALLATION

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain cast stone courses to uniform dimension. Form bed and head joints of uniform thickness.

C. Cast Stone Coursing:
   1. Joint Location: As indicated on Drawings.

D. Placing and Bonding:
   1. Install anchors to support and position cast stone.
   2. Drench cast stone units with clear running water, just prior to setting.
3. Lay cast stone units in full bed of mortar, with full head joints.
4. Leave head and top joints in units with exposed top surfaces open to receive sealant.
5. Fill dowel holes and anchor slots with mortar.
6. Do not shift or tap cast stone units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
7. Rake mortar joints 3/4 inches deep for pointing. Sponge face of each stone to remove excess mortar.
8. Tuck point mortar joints. Pack mortar tightly into joint. Tool joint surface to shape specified.
9. Site cutting of cast stone units is not permitted.

E. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Build backup masonry wythe ahead of cast stone veneer to receive cavity insulation and air/vapor barrier adhesive.

F. Anchorage - Cast Stone Veneer:
1. Embed wall ties in masonry backing to bond veneer for every 2-2/3 sq ft.
2. Secure wall ties to stud framed backing and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally.
3. Place wall ties at each horizontal and vertical joint around perimeter of openings, within 12 inches of openings.

G. Flashings:
1. Extend flashings horizontally one brick course below cast stone veneer and turn down on outside face to form drip.
2. Turn flashing up minimum 8 inches and bed into mortar joint of masonry seal to concrete seal to sheathing over steel stud framed backing.
3. Lap end joints minimum 6 inches and seal watertight.
4. Turn flashing, fold, and seal at corners, bends, and interruptions.

H. Control And Expansion Joints:
1. Form control joint by omitting mortar as sealing joint in accordance with Section 07 92 00.

3.4 ERECTION TOLERANCES
A. Section 01 40 00 - Quality Requirements: Tolerances.
B. Maximum Variation of Joint Thickness: Plus 1/16 inch; minus 1/8 inch.
C. Maximum Offset From Adjacent Unit: 1/8 inch.
D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
E. Maximum Variation from Plumb: 1/4 inch in each story non-cumulative; 1/2 inch in two stories or more.
F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

3.5 CLEANING
A. Section 01 77 00 - Execution Requirements: Requirements for cleaning.
B. Remove excess mortar and sealant as work progresses.
C. Replace defective mortar. Match adjacent work.
D. Wet cast stone. Clean soiled surfaces with cleaning solution.
E. Use non-metallic tools in cleaning operations.
3.6 PROTECTION OF FINISHED WORK

A. Section 01 77 00 - Execution Requirements: Requirements for protecting finished Work.

B. Protect cast stone from contact with mortar, soil, and other materials capable of staining or discoloring cast stone.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Structural steel framing members and connections.
   2. Shop prime painting and touch up painting in the field.
   3. Temporary construction bracing.
   4. Fabrication and erection inspection and testing.
   5. Grouting under base plates and bearing plates.

B. Related Requirements:
   1. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
   2. Division 01 Section "Submittals" for administrative requirements for the submission of shop drawings and other submittals.
   3. Division 05 Section "Steel Decking" for field installation of deck.
   4. Division 05 Section "Metal Fabrications"
   5. Division 09 Section "Painting" for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers’ written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions for installation.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 ACTION SUBMITTALS

A. Shop drawings and erection drawings shall not be made by using reproductions of Contract Drawings.

B. Shop Drawings: Show fabrication of structural-steel components for review.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts.

1.7 SUBMITTALS

A. Product Data: For each type of product

B. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Connection Calculations: Contractor shall design all connections not specifically detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Texas. Submit design calculations for the connections designed by the contractor, prior to or with the steel shop drawings. Shop drawings containing connections for which calculations have not been received shall be returned unchecked as an incomplete submittal. Calculations shall be retained for the Engineer's file and will not be approved or returned.
   1. Connections shall be designed in accordance with the requirements specified in the Structural Drawings and Specifications.
   2. Beam connections: Submit a complete calculation for each different beam connection used and detailed on the shop drawings. Conditions which are similar may be grouped together so as to utilize a single connection design.
   3. Submit complete connection calculations for wind brace connections, truss connections, moment connections and other connections where specified on the Contract Drawings. Each calculation shall identify the location or locations for which the connection applies, the member mark(s) from the Contract Documents, the piece mark(s) from the shop drawings, the member size, the design loading(s), member size, and the end of the member to which the connection applies.

D. Qualification Data: For installer and fabricator.

E. Welding
   1. Provide welding certificates. Welding Procedure Specifications (WPSa) and Procedure Qualification Records (PQRs) : Provide according to AWS D1.1/D1.1M, "Structural Welding Code – Steel, " for each welded joint whether prequalified or qualified by testing, including the following:
      a. Power source (constant current or constant voltage).
      b. Electrode manufacturer and trade name.

F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

G. Mill test reports for structural steel, including chemical and physical properties, signed by manufacturers certifying that all the steel supplied meets the requirements in Part 2 of this specification.

H. Product Test Reports: For the following:
   1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   2. Shop primers.

I. Survey of existing conditions.
J. Field quality-control and special inspection reports.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in a nationally accepted inspections program acceptable to the registered design professional in responsible charge.

B. Fabricator Qualifications: The special inspector shall verify that the fabricator maintains detailed fabrication and quality control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.
   1. Exception: Special inspections shall not be required where the work is done on the premises of a fabricator that is enrolled in a nationally accepted inspections program acceptable to the registered design professional in responsible charge. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to building official upon request and to the registered design professional in responsible charge stating that the work was performed in accordance with the approved construction documents.

C. Installer Qualifications: An installer specializing in performing work of this section with a documented record of successful projects of this nature. Minimum of 5 years experience.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

E. Comply with applicable provisions of the following specifications and documents:
   1. AISC 303.
      a. With the following change in paragraph 4.4.1.b:
         1) "Confirmation that the owner's designated representative for design has reviewed the connection details shown on the shop and erection drawings and submitted in accordance with section 3.1.2, if applicable."
   2. AISC 360.
   3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
   5. AWS D1.1.
   6. UL "Fire Resistance Directory."
   7. SSPC Standards

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
   1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
   2. Clean and relubricate bolts and nuts that become dry or rusty before use.
   3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
   1. Select and complete connections using schematic details indicated and AISC 360.
   2. Use Load and Resistance Factor Design; data are given at factored-load level.

B. Moment Connections: Type FR, fully restrained.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M.
   1. Rolled Heavy Shapes (flange thickness exceeding 2 inches): Rolled heavy shapes connected using complete-joint-penetration groove welds that fuse through thickness of the flange shall have Charpy V-notch (CVN) impact test results in accordance with ASTM A6/A6M, Supplementary Requirement S30, Charpy V-Notch Impact Test for Structural Shapes – Alternate Core Location. The impact test shall meet a minimum average value of 20 foot-pounds (27 Joules) absorbed energy at a maximum temperature of +70°F (+21°C). Furthermore, joints shall meet AISC 360, Sections J1.5, J1.6, J2.6, and M2.2.

B. Channels, Angles, M, and S-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M.
   1. Built-Up Heavy Shapes (plates with thickness exceeding 2 inches): Built-up heavy shapes connected using complete-joint-penetration groove welds that fuse through thickness of the plates shall have Charpy V-notch (CVN) impact test results in accordance with ASTM A6/A6M, Supplementary Requirement S5, Charpy V-Notch Impact Test. The impact test shall be conducted in accordance with ASTM A673/A673M, Frequency P, and meet a minimum average value of 20 foot-pounds (27 Joules) absorbed energy at a maximum temperature of +70°F (+21°C). Furthermore, joints shall meet AISC 360, Sections J1.5, J1.6, J2.6, and M2.2.

D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.

E. Steel Pipe: ASTM A 53/A 53M, Type E, Grade B.
   1. Weight Class: As indicated.
   2. Finish: Black except where indicated to be galvanized.

F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

B. Unheaded Anchor Rods: ASTM F 1554, Grade 36, unless noted otherwise
   5. Finish: Plain, unless noted otherwise.
C. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
   3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.

D. Threaded Rods: ASTM A 36/A 36M.
   3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
   4. Finish: Plain, unless noted otherwise.

2.4 PRIMER

A. Primer: Comply with Division 09 painting Sections.

B. Galvanizing Repair Paint: ASTM A 780/A 780M.

2.5 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

   1. Camber structural-steel members where indicated. Beams received by the fabricator with 75% of the specified camber require no further cambering. Otherwise, for beams that are equal to or less than 50 feet (15,000 mm) in length, the variation shall be equal to or less than -0 to +0.5 inches (13 mm). For beams that are greater than 50 feet (15,000 mm) in length, the variation shall be equal to or less than -0 to +0.5 inches plus 0.125 inches for each 10 feet or fraction thereof (13 mm plus 3 mm for each 3,000 mm or fraction thereof) in excess of 50 feet (15,000 mm) in length.
   2. Fabricate beams with rolling camber up.
   3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
   4. Mark and match-mark materials for field assembly.
   5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."
F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
   1. Cut, drill, or punch holes perpendicular to steel surfaces in the shop. Do not thermally cut bolt holes or enlarge holes by burning in the field.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's “Specification for Structural Joints Using High-Strength Bolts” for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened, unless noted otherwise.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

A. Shop prime steel surfaces except the following:
   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
   2. Surfaces to be field welded.
   4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
   5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
   1. SSPC-SP 2, "Hand Tool Cleaning."
   2. Per requirements of Division 09 painting sections.

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
   1. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.9 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
   1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
   2. Galvanize exposed structural steel as indicated in the contract drawings, including but not limited to: lintels, shelf angles, and welded door frames (as well as all fasteners) attached to structural-steel frame and located in exterior walls.

2.10 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC’s "Specification for Structural Joints Using High-Strength Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
   1. Liquid Penetrant Inspection: ASTM E 165.
   2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
   4. Radiographic Inspection: ASTM E 94.

D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
   1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Design of temporary bracing and supports shall be the responsibility of the Contractor. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360, unless closer tolerances are required for proper fitting of adjoining or enclosing materials, in which case the more stringent shall apply.

   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Weld plate washers to top of baseplate.
   3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
   5. Grout under baseplates in accordance with Division 03 concrete sections.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated. Any member having a splice not shown and detailed on the accepted shop drawings shall be rejected.

F. Do not field cut or alter structural members without approval of Architect/Engineer. Do not use thermal cutting during erection.

G. Gas Cutting: Do not use gas cutting torches in the field to correct fabrication errors in structural framing.

H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts " for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened.
      a. High-strength A325 bolts shall be "snug-tight" unless specifically designated otherwise. Bolts shall be tightened such that all of the plies in a connection are brought into firm contact, and all of the bolts in the joint have been tightened sufficiently to prevent the removal of the nuts without the use of a wrench.
      b. ASTM F436 or 5/16 inch thick common plate washers shall be placed over slotted holes occurring in an outer ply such that the hole is completely covered. ASTM F436 beveled washers shall be used where the outer face of the bolted parts has a slope greater than 1:20 with respect to the bolt axis.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
   2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
   3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Verify structural-steel materials and inspect steel frame joint details.
   2. Verify weld materials and inspect welds.
   3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using High-Strength Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
   1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency’s option:
      a. Liquid Penetrant Inspection: ASTM E 165.
      b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
      c. Ultrasonic Inspection: ASTM E 164.
      d. Radiographic Inspection: ASTM E 94.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

B. Touch-up Cold Galvanizing: Touch up areas of hot dip galvanized members where galvanizing has been abraded during shipping and erection and areas where galvanizing has been removed or damaged due to welding. Apply cold galvanizing compound in accordance with the manufacturer's instructions to a minimum dry film thickness of 2.0 mils.

C. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning.

END OF SECTION
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. Furnish all labor and materials required to fabricate, deliver, and erect steel joists, including all bridging, ceiling extensions, and extended ends.

B. This Section includes the following:
   2. KCS-type K-series steel joists.

C. Related Sections include the following:
   1. Division 5 Section "Structural Steel" for steel framing supporting steel joists.

1.3 DEFINITIONS

A. SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

B. Design special joists to withstand design loads with live load deflections no greater than the following:
   1. Roof Joists: Vertical deflection of 1/360 of the span.

1.5 SUBMITTALS

A. Submit in accordance with Division 1 Section “Submittals.”

B. Submittals for Review:
   1. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, camber, coatings, material properties, configuration, joist accessories; splice and connection locations and details; and attachments to other construction.

C. Submittals for Information:
   1. Design calculations for all joist for which the standard load tables are not applicable. Submit prior to, or with the shop drawings. Calculations shall bear the seal of a Regis-
Shop drawings submitted without corresponding calculations will be returned unchecked as an incomplete submit-
tal. Calculations will be retained for the Architect's file and will not be approved or re-
turned.

2. Welders Certificates: Submit certificates to Owner's Testing Laboratory, certifying that welders to be employed on the project have passed AWS qualification tests within the previous 12 months. If recertification of welders is required, recertification shall be contractor's responsibility.

3. Product Data: For each type of joist, accessory, and product indicated.

4. Manufacturer Certificates: Signed by manufacturers certifying that joists comply with re-
quirements.

5. Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with require-
ments.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists, including headers and other supplemental framing, complying with applicable standard specifications and load tables of SJI "Specifications." Manufacturer shall have a minimum of five years documented experience in the design and fabrication of open-web joists and joist girders

   1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and han-
dling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.

B. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36, minimum

C. Steel Bearing Plates: ASTM A 36/A 36M.

D. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

   1. Finish: Plain, uncoated.

E. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

   1. Finish: Plain, uncoated.

F. Welding Electrodes: Comply with AWS standards.
2.2 PRIMERS

A. Primer: SSPC-Paint 15, Type 1 red oxide, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.3 K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord, unless noted otherwise.

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

C. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work. Refer to Paragraph 2.5 C. for additional welding requirements.

D. Provide holes in chord members for connecting and securing other construction to joists. Do not make or enlarge holes by burning.

E. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

F. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

G. Camber joists according to SJI's "Specifications."

H. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

2.4 ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Hot-dip zinc coat according to ASTM A 123/A 123M.

C. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.

D. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 FABRICATION

A. Splices: Shop splices may occur in chord or web members. Members containing a butt weld splice shall develop an ultimate tensile force of at least 57,000 psi times the full design area of the chord or web.

B. Holes shall not be made or enlarged by burning with a torch.
C. Welds shall meet the following criteria for acceptance:
   1. Remove slag from welds prior to inspection.
   2. Cracked welds are not acceptable and must be repaired.
   3. Thorough fusion shall exist between the weld and base metal, as determined by visual inspection.
   4. Unfilled weld craters shall not be included in the design length of the weld.
   5. Undercut shall not exceed 1/16" provided that it is oriented parallel to the principal stress.
   6. The sum of surface (piping) porosity diameters shall not exceed 1/16" in any 1" of design weld length.
   7. Weld spatter that does not interfere with paint coverage is acceptable.

2.6 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing 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 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
   1. Before installation, splice joists delivered to Project site in more than one piece.
   2. Space, adjust, and align joists accurately in location before permanently fastening.
   3. Minimum bearings and anchorage shall conform to referenced SJI standards and the Drawings.
   4. Allow for erection loads. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction. Construction loads shall not be applied until joists are permanently fastened to supports and all bridging has been installed.
   5. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using ASTM A 307 carbon-steel bolts.

E. Bridging shall conform to SJI standards and the shop drawings. Provide and install extra bridging, where indicated or where required due to loading, in addition to the minimum SJI requirements.
Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

### 3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. Field welds will be visually inspected according to AWS D1.1/D1.1M.

C. In addition to visual inspection, field welds will be tested according to AWS D1.1/D1.1M and the following procedures, as applicable:
   4. Liquid Penetrant Inspection: ASTM E 165.

D. Bolted connections will be visually inspected.

E. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."

F. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

G. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

### 3.4 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, abutting structural steel, and accessories.
   1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

**END OF SECTION**
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. Roof deck.

B. Work Included
   1. Furnish all labor and materials required to fabricate, deliver and install steel roof deck and accessories including formed steel cant strips, eave strips, valley strips, sump pans, edge closures, pour stops, reinforcing plates and related accessories.

C. Related Sections include the following:
   1. Division 5 Section "Structural Steel" for steel framing supporting deck.

1.3 SUBMITTALS

A. Submittals for Review:
   1. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
   2. Product Data: For each type of deck, accessory, and product indicated. Provide deck dimensions, sectional properties, uplift resistance and diaphragm capacity for specified fastener layout and support spacing, and finishes.

B. Submittals for Information:
   1. Product Certificates: For each type of steel deck, signed by product manufacturer. Certify that products comply with SDI, UL and ICBO standards as specified.
   2. Manufacturer's installation instructions.
   3. Welding certificates: For each welder employed on the Work.
   4. Field quality-control test and inspection reports.
   5. ICBO Research/Evaluation Reports: Deck units shall be approved by the International Conference of Building Officials and shall have a corresponding report from ICBO.
   6. Deck units shall be classified by Underwriter's Laboratory, Inc. and shall be labeled and marked as required by UL, indicating manufacturer testing and inspection.

1.4 QUALITY ASSURANCE

A. Installer: Company specializing in performing the work of this Section with minimum 5 years documented experience.

B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

D. Comply with applicable provisions of the following specifications and documents.
   1. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
   2. SDI (Steel Deck Institute) - Design Manual for Composite Decks, Form Decks, Roof Decks, Cellular Metal Floor Deck with Electrical Distribution.
   3. SSPC (Steel Structures Painting Council) - Painting Manual.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Steel Deck:
      a. ASC Profiles, Inc.
      c. Consolidated Systems, Inc.
      d. DACS, Inc.
      e. D-Mac Industries Inc.
      f. Epic Metals Corporation.
      g. Marlyn Steel Decks, Inc.
      h. New Millennium Building Systems, LLC.
      i. Nucor Corp.; Vulcraft Division.
      j. Roof Deck, Inc.
      k. United Steel Deck, Inc.
      l. Valley Joist; Division of EBSCO Industries, Inc.
      m. Verco Manufacturing Co.
      n. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

2.2 ROOF DECK

A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:
   1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
   2. Deck Profile: Type WR, wide rib.
   3. Profile Depth: 1-1/2 inches.
   4. Design Uncoated-Steel Thickness: 0.0295 inch.
   5. Span Condition: As indicated.
2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
   1. Mechanical Fasteners: Galvanized hardened steel, self tapping "Teks" screws, manufactured by Illinois Tool Works, Inc., Buildex Division, or equal. Size shall be No. 10 minimum, unless noted otherwise.
   2. Powder-Actuated Mechanical Fasteners for roof deck and floor deck applications shall have minimum 1/2 inch (12 mm) diameter steel washers, knurled shanks, ballistic points and electroplated zinc coating conforming to ASTM B 633, SC 1, Type III. Powder-actuated mechanical fasteners shall be recognized by ICC-ES AC43, SDI listed and approved by a third party agency for wind uplift. Powder-actuated mechanical fasteners shall also be listed for use with fire resistive steel roof deck assemblies.
      a. Hilti X-ENP-19 L15 or Hilti X-HSN-24 pin as recommended by the manufacturer for the application, or equal.

C. Side-Lap Fasteners:
   1. Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
   2. Hilti S-SLC01 M HWH when used in conjunction with Hilti powder-actuated mechanical fasteners.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 30 for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter.

I. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, sealed watertight. For drains, cut holes in the field.

J. Galvanizing Repair Paint: SSPC-Paint 20.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

3.3 ROOF-DECK INSTALLATION

A. Deck Welding: Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
   1. Weld Diameter: 5/8 inch or 3/4 inch, nominal as indicated in the Structural Notes.
   2. Weld Spacing: As indicated in the Structural Notes.

B. Mechanical Fastening: Fasten roof-deck panels to steel supporting members in accordance with manufacturer's instructions, and as follows:
   1. Mechanical Fastener: Hilti X-ENP-19 L15 or Hilti X-HSN as indicated in the Structural Notes.
   2. Spacing: As indicated in the Structural Notes.

C. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span, 18 inches, or as indicated in the Structural Notes, and as follows:
   1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
   2. Hilti S-SLC01 M HWH when used in conjunction with Hilti powder-actuated mechanical fasteners

D. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
   1. End Joints: Lapped 2 inches minimum.

E. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner.
   1. Install reinforcing channels or zees in ribs to span between supports and weld.

F. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
   1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.
G. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer’s written instructions to ensure complete closure.

H. Architectural finishes and mechanical, electrical, and plumbing equipment shall not be hung directly from the metal deck.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor’s expense, will be performed to determine compliance of corrected work with specified requirements.

3.5 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer’s written instructions.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes shop fabricated metal items:
   1. Lintels.
   2. Ledge and shelf angles.
   3. Perforated metal panels.
   4. Structural supports for miscellaneous attachments.
   5. Structural supports for rooftop equipment.

B. Miscellaneous metal work including, but not limited to, items fabricated from metal in shapes, plates, bars, strips, tubes, pipes and castings which are not a part of other metal systems in other sections of these specifications. Furnish all items required, whether or not they are specifically mentioned in this Section, including anchorage devices and required appurtenance.

C. Related Sections:
   1. Section 03 30 00 – Cast-In-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this section in concrete.
   2. Section 04 20 00 – Unit Masonry Assemblies: Execution requirements for embedded anchors and attachments for metal fabrications specified by this section in masonry.
   3. Section 05 52 00 – Handrails and Railings.
   4. Section 09 91 00 – Painting: Field applied paint finish.

1.2 REFERENCES

A. ASTM International:
   8. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

B. American Welding Society:
   1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
   2. AWS D1.1 - Structural Welding Code - Steel.
   3. AWS D1.6 - Structural Welding Code - Stainless Steel.
C. SSPC: The Society for Protective Coatings:
   1. SSPC – Steel Structures Painting Manual.
   2. SSPC SP 1 – Solvent Cleaning.
   3. SSPC SP 10 – Near-White Blast Cleaning.
   4. SSPC Paint 15 – Steel Joist Shop Paint.
   5. SSPC Paint 20 – Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

1.3 QUALITY ASSURANCE

A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittals: Submittal requirements.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

C. Samples: Submit two samples of safety stair nosings, 8 inch in length illustrating factory finish and color.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 – Product Requirements: Product storage and handling requirements.

B. Accept metal fabrications on site in labeled shipments. Inspect for damage.

C. Protect metal fabrications from damage by exposure to weather.

1.6 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.1 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500, Grade B.

C. Plates: ASTM A283/A283M.


F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide.

H. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic zinc rich.

2.2 LINTELS

A. Lintels: Steel sections, size and configuration as indicated on Drawings, length to allow 8 inches minimum bearing on both sides of opening.
   1. Exterior Locations: Galvanized.
   2. Interior Locations: Prime paint, one coat.

2.3 LEDGE AND SHELF ANGLES

A. Ledge and Shelf Angles, Channels and Plates Not Attached to Structural Framing: For support of masonry:
   1. Prime paint, one coat at interior.
   2. Hot-dip galvanize items exposed to the exterior.

2.4 PERFORATED METAL PANELS

A. Epoxy powder coated steel panels, curved, with rolled angle top and bottom, angles at verticals edges. Pre-drilled holes for field bolted attachment. Panels shop-fabricated and powder coated as units after all welding and drilling is completed.


2.5 STRUCTURAL SUPPORTS

A. Other Structural Supports: Steel sections, shape and size as indicated on Drawings required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat at interior applications, galvanize exterior applications.

2.6 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.7 FACTORY APPLIED FINISHES - STEEL

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime paint items with one coat except where galvanizing is specified. Finish as scheduled in Section 09 91 00 – Painting.
D. Galvanized Structural Steel Members: Galvanize after fabrication to ASTM A123. Furnish minimum 1.25 oz/sq ft galvanized coating.

E. Galvanized Non-structural Items: Galvanize after fabrication to ASTM A123. Furnish minimum 1.25 oz/sq ft galvanized coating.

2.8 FABRICATION TOLERANCES
A. Squareness: 1/8 inch maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch.
C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Section 01 33 00 - Submittals: Coordination and project conditions.
B. Verify field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION
A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.
B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION
A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.
C. Field weld components indicated on shop drawings.
D. Perform field welding in accordance with AWS D1.1.
E. Obtain approval of Architect/Engineer prior to site cutting or making adjustments not scheduled.
F. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

3.4 ERECTION TOLERANCES
A. Section 01 40 00 - Quality Control: Tolerances.
B. Maximum Variation From Plumb: 1/4 inch per story or for every 12 ft in height whichever is greater, non-cumulative.
C. Maximum Offset From Alignment: 1/4 inch.

END OF SECTION
SECTION 05 52 00
HANDRAILS AND RAILINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Handrails, intermediate rails and fittings.

1.2 RELATED SECTIONS
A. Section 03 30 00 – Cast-In-Place Concrete: Placement of anchors in concrete.

1.3 REFERENCES
A. TAS - Texas Accessibility Standards.
B. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
D. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
E. ASTM E985 - Permanent Metal Railing Systems and Rails for Buildings.
F. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.4 DESIGN REQUIREMENTS
A. Railing assembly, wall rails, and attachments to resist lateral force of 200 lbs at any point or 50 lbs per lineal foot, without damage or permanent set. Test in accordance with ASTM A935.

1.5 QUALITY ASSURANCE
A. Welder's Certificates: Submit under provisions of Section 01 30 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.6 SUBMITTALS FOR REVIEW
A. Section 01 30 00 – Submittals: Procedures for submittals.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
C. Samples: Submit two inch long samples of handrail. Submit two samples, of wall bracket, escutcheon and end stop.
PART 2 - PRODUCTS

2.1 RAILING SYSTEM

A. Handrails, Posts, and Rail Strands:
   1. Exterior: ASTM A500, Grade B, 1.625 inch outside diameter x 10 gauge round steel tubing; welded joints.

B. Fittings: Elbows, T-shapes, machined steel.

C. Mounting: Reference Civil drawings for sleeve requirements.

D. Splice Connectors: Steel concealed spigots.

E. Galvanizing: To ASTM A123/A123M, minimum 1.25 oz/sq ft galvanized coating.

F. Shop and Touch-Up Primer: Not permitted.

2.2 FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to site. Fabricate exterior components for mechanical attachment in the field; on-site welding is not permitted.

B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

C. Provide anchors, plates and angles required for connecting railings to structure.

D. Exposed Mechanical Fastenings: Not permitted.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

F. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   1. Hot-dip galvanize after fabrication.

G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

H. Accurately form components to suit ramps, stairs, landings, to each other and to building structure.

I. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

J. Isolate dissimilar metal connections.
PART 3 - EXECUTION

3.1 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION
   A. Clean and strip prime steel items to bare metal where side welding is required.
   B. Supply items required to be embedded in concrete, concrete masonry or placed in partitions with setting templates, to appropriate sections.

3.3 INSTALLATION
   A. Install components plumb and level, accurately fitted, free from distortion or defects.
   B. Anchor railings to structure with anchors in sleeves for complete installation.
   C. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.4 ERECTION TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Rough framing lumber for blocking, nailers, grounds, curbs, etc., rough plywood and connecting hardware in locations other than part of the roofing system.

B. Preservative treatment of wood.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 – Roof Carpentry: Nailers, cants, curbs, and sheathing as part of the roofing system.

B. Section 06 20 00 – Finish Carpentry.

C. Section 06 41 00 – Custom Casework.

1.3 QUALITY ASSURANCE

A. Lumber Grading Rules and Wood Species shall be in conformance with Voluntary Product Standard PS20-70. Grading rules of the following associations apply to materials furnished under this Section.

1. Southern Pine Inspection Bureau (SPIB).
2. West Coast Lumber Inspection Bureau (WCLIB).

B. Plywood: Comply with the requirements of Softwood Plywood-Construction and Industrial, PS 1-74.

C. Grade Marks: Identify all lumber and plywood by official grade mark.

1. Lumber: Grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, rules under which graded, where applicable and condition of seasoning at time of manufacture.

   a. Type, grade, class and identification index.
   b. Inspection and testing agency mark.

1.4 COORDINATION

A. Coordinate Work with other trades (Electrical, Mechanical, etc.) by providing all wood backing, furring, stripping or blocking indicated or required for installation and attachment of Work of all other trades.

B. Coordinate Work with Section 06 10 00 for carpentry associated with roofing system.
1.5 MEASUREMENTS
   A. Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING
   A. Immediately upon delivery to job site, place materials in area protected from weather.
   B. Store materials a minimum of 6 inches above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.
   C. Do not store seasoned materials in wet or damp portions of building.
   D. Deliver, store, handle and protect materials under provisions of Section 01 60 00.

PART 2 - PRODUCTS

2.1 MATERIALS
   A. Lumber:
      1. Dimensions: Specified dimensions are nominal. Actual dimensions conform to industry standards established by the American Lumber Standards Committee and the rules writing agencies.
      2. Moisture Content: Provide seasoned lumber with 19% maximum moisture content at time of closing in of building.
      3. Surfacing: Surface four sides (S4S), unless otherwise indicated.
      4. No. 1 Dimension Grade Southern Pine or Construction Grade Douglas Fir shall be used at interior sleepers, screeds, bracing, furring, blockings, backs, grounds, stripping, etc.
      5. Refer to Section 06 10 50 – Roof Carpentry for eave curbs, nailers, roof opening curbs associated with roofing repairs.
   B. Plywood:
      1. Exterior type plywood shall be used where the plywood will be exposed in the finished work, or installed against concrete or masonry; Grade B on exposed face and Grade C on concealed faces.
      a. Interior type plywood shall be used where the plywood will be concealed by other work; Grade C & D plugged unless otherwise indicated.
   C. Connecting Hardware:
      1. Nails: Common wire, galvanized for exterior Work, high humidity locations, and treated wood; plain finish for other interior locations; size and type to suit application.
      2. Screws: Standard domestic manufacture, bright steel, except galvanized for exterior use and of brass, bronze, aluminum or stainless steel when used to attach items made of those materials.
      3. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers or carriage bolts with square nuts and cut washers where indicated. Bolts, nuts and washers wholly or partially exposed on exterior shall be galvanized.
      5. Power Driven Inserts: Ramset or as approved by Architect; install per manufacturer's instructions.
2.2 FACTORY WOOD TREATMENT

A. Wood Preservation Treatment:
   1. Method: Pressure impregnate with Wolman salts in accordance with American Wood Preservers Institute Standard LP02 for normal exposure.
   2. Treat all wood in contact with concrete or masonry.
   3. Brush-coat surfaces of lumber sawed or cut after treatment with same preservation used at plant.
   4. Certification: Submit certification from the treating plant stating the following:
      a. Chemicals and process used.
      b. Net amount of salts retained.
      c. Conformance to AWPI Standard LP-2.
      d. Maximum moisture content of 19 percent after treatment.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Perform all Work in accordance with the best standards of practice relating to the trade. Plan and layout carefully work as required to carry out the intent of the drawings and to properly accommodate the Work of other trades.

B. Saw-cut accurately all lumber and fit into the respective locations, true to line, grade, plumb and level. Secure permanently in proper position with proper fastenings to render all parts rigid.

C. Bore holes for bolts true to line and of the same diameter as the bolts. Drive bolts into place with a tight fit, and provide plates or washers.

D. Form nailing blocks and bucks to the shape and dimension indicated on the drawings or as required to suit the particular purpose. Secure blocking firmly in precise position required to receive, support and engage the several parts of the work.

E. Do all cutting, fitting, fabricating, erecting, edging, blocking, nailing, and securing of all items of rough hardware throughout, including all furring, blocking, nailers, etc.

F. Build in items where indicated on Drawings or required for the attachment of finish work. Shape and install work to provide solid and adequate surfaces for securing and connecting work in its proper position.

G. Cut and frame all timbers and wood work required by the various other trades for the completion of their Work. Provide all wood blocks, nailing strips, grounds, door bucks, furring, etc.

H. Frame, anchor, tie and mutually brace all members to develop the strength and rigidity required for the purpose for which they are to be used. Do not stress members in excess of the designed strength.

I. Consult Plumbing, Heating, Ventilating, Air Conditioning, Electrical and other trades and erect all backing, grounds, furring, etc., necessary for the proper support of their Work and fixtures.

J. Furnish and install nails, screws, bolts, anchors, washers, clips, shields and other rough hardware to complete work.

K. Provide temporary enclosures, partitions, stairs, etc., necessary to properly protect and facilitate the Work. Provide all lumber required for scaffolding and protection of finished Work.

L. Space miscellaneous framing and furring at 16 inches o.c. unless otherwise indicated.
M. Construct members of continuous pieces of longest possible lengths.

N. Cleaning: Remove stain and soil that would show through finish or interfere with painting. Repair or replace Work damaged after installation.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Framing with dimension lumber.
   2. Rooftop equipment bases and support curbs.
   3. Wood blocking and nailers.
   4. Plywood sheathing.
   5. Isolation tape.

B. Related Sections
   1. Section 07 22 00 - Roof Insulation
   2. Section 07 52 16 - Modified Bitumen Roof System
   3. Section 07 62 00 - Flashing and Sheet Metal
   4. Section 07 72 00 - Roofing Accessories

1.3 REFERENCES


B. American Wood Preservers’ Association (AWPA): AWPA Book of Standards.


D. Product Standard of NBS (PS):
   1. PS 1 - Construction and Industrial Plywood.

1.4 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
D. Submit product data and certificates under provisions of the appropriate Division 1 Section for the following:
   1. Dimensional treated lumber.
   2. CDX plywood.
E. Submit product data for all wood fasteners, including their sizes, material, type and finish.
F. Laboratory Test Reports:
   1. Provide documentation for adhesives and plywood, indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
   2. For each composite-wood product used, provide documentation indicating that the bonding agent contains no urea formaldehyde.
   3. For each adhesive used, provide documentation indicating that the adhesive contains no urea formaldehyde.

1.5 DELIVERY, STORAGE AND HANDLING
A. Deliver materials in bulk as necessary to provide continuous operations and no Work slow-down. Schedule and coordinate with Owner to cause the least inconvenience to Owner's daily activities. All deliveries and unloading or loading activities are the responsibility of the Contractor. Owner will not take responsibility for any delivery activities.
B. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
C. Store materials in designated areas, out of the way of Owner's on-going operations.
D. Store and handle materials to preclude damage and contamination with moisture or foreign matter.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL
A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   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.
B. Maximum Moisture Content of Lumber: 19% at time of dressing unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS
A. Preservative Treatment by Pressure Process: AWPA U1.
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all miscellaneous carpentry unless otherwise indicated, items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.3 DIMENSION LUMBER FRAMING

A. Southern Pine;
1. Two-inch nominal dimension lumber: No. 1 common, stress rated Fb 1350.

2.4 PLYWOOD

A. DOC PS 1, Exposure 1, C-D Plugged, thickness as shown on drawings. Do not further treat after manufacture.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Provide fasteners in the sizes and of the type indicated.
2. Screws and Nails in Non-Treated Wood: Hot-dipped galvanized finish.
3. ¼-inch and Larger Diameter Bolts: Hot-dip galvanized finish.

C. Masonry Anchors:
1. Masonry and/or Concrete Substrate Fasteners: Steel pin and zinc-jacketed fasteners; Zamac “Hammer Screw,” ¼-inch x 1 1/2-inch, or approved equal.
2. Masonry Substrate Fasteners: “Tapcon,” or approved equal, in sizes and lengths dictated by existing conditions, and approved by the Architect.

2.6 MISCELLANEOUS MATERIALS

A. Isolation Tape: Multi-Purposed Grade Duct Tape, with polyethylene-coated cloth backing, natural rubber-based adhesive, and silver in color, equal to DT-11 as produced by 3-M Corporation.
1. Total Thickness: 11 mils, ASTM D3652.
2. Peel Adhesion: 88oz/in, ASTM D3330.
4. Maximum Performance Temperature: 200° F.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit 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.
1. Securely attach carpentry Work to substrate by anchoring and fastening as shown and as required by recognized standards.
2. Countersink nail heads on exposed carpentry Work and fill holes.
3. Use common wire nails, except as otherwise indicated.
4. Select fasteners of size that do not penetrate members where opposite sides are exposed to view or will receive finish materials.
5. Make tight connections between members.
6. Pre-drill holes when required to prevent splitting of wood.

B. Where wood-preservative-treated lumber is installed adjacent to metal decking, metal curbs or other steel members, install continuous isolation tape between wood and metal or steel components.

C. Discard units of material with defects which might impair quality of Work, and units which are too small to use in fabricating Work with minimum joints or optimum joint arrangement.

D. Provide wood products to size and shape shown and coordinate closely with all other scheduled Work for continuous operation of all trades.

E. Install wood nailers at perimeters and flanged penetrations, matching insulation in height.

F. When securing wood blocking by nailing:
   2. Secure 1-1/2 inch or 2-inch materials with 16d stainless steel framing nails.
   3. Do not exceed nail spacing 12-inches on centers, or as detailed, and drive nails securely in place. Remove and dispose of bent or deformed nails or fasteners.

G. Bolts at Perimeter Nailers:
   1. 5/8-inch diameter galvanized carriage bolts with washers, spaced at 36 inches on centers, with a minimum of 3 bolts per corner and one within 6 inches of each cut end of any lumber piece, corners and bends.
   2. Draw bolt heads flush with top of nailers by hammering or drawing by tightening of the nut below the perimeter steel angle.

H. Plywood Decking over Metal Deck: Secure plywood through insulation or directly to steel decking with specified fasteners applied at the rate of thirty-three (33) fasteners per sheet. Fasteners shall be installed in a uniform pattern of alternating rows of seven (7) and six (6) fasteners per row laid parallel to the long edge of the sheet.

I. Correlate locations of nailers, blocking, and similar supports to allow proper attachment of other Work necessary.

J. Provide additional fasteners in existing perimeter wood blocking as necessary so fastener spacing does not exceed 24” on center staggered.

3.2 PROTECTION

A. Protective Walkways: Install full sheets of 1/2-inch plywood over minimum 1-inch insulation board over areas of new roof surface to be trafficked by personnel and wheeled vehicles.

3.3 CLEANING

A. Pick up spilled nails and fasteners from grounds and roof surface continually.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Finish carpentry items, as indicated or reasonably implied by the Drawings, other than shop fabricated Work, with hardware and attachment accessories.

1.2 RELATED SECTIONS

A. Section 06 10 00 – Rough Carpentry.
B. Section 06 41 00 – Custom Casework.
C. Section 08 14 16 – Flush Wood Doors.
D. Section 09 91 00 – Painting.

1.3 REFERENCES

A. AWI - Quality Standards.
C. FS TT-W-550 - Wood Preservative, Chromated Copper Arsenate Mixture.
E. FS MMM-A-130 - Adhesive, Contact.
F. PS 1 - Construction and Industrial Plywood.
H. PS 51 - Hardwood and Decorative Plywood.
I. PS 58 - Basic Hardwood.

1.4 QUALITY ASSURANCE

A. Perform the Work of this Section in accordance with AWI Quality Standards, premium grade, except where better quality materials or construction is shown or specified.
B. Kiln dry all finish wood to maximum 12 percent moisture content unless otherwise indicated.
C. All exposed wood to receive clear finish shall be “clear face”, free of knots, not finger jointed, no worm holes, no sap wood or gum spots.

D. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 30 00.

B. Submit shop drawings of millwork showing sizes, materials, grain run and methods of construction.

C. Submit product data for wood treatment materials and methods.

1.6 MEASUREMENT

A. Verify all dimensions by taking field measurements; proper fit and attachment of all parts is required.

1.7 COORDINATION

A. Carefully coordinate this Work with all other trades whose Work will affect or be affected by this Work. Do all cutting and patching required to accommodate their Work. Protect adjacent Work.

1.8 DELIVERY, STORAGE AND HANDLING

A. Keep lumber and other materials dry during delivery and storage. Protect against exposure to weather.

B. Protect millwork during transit, delivery, storage and handling to prevent damage and store within dry enclosed area.

PART 2 - PRODUCTS

2.1 LUMBER MATERIALS

A. Softwood Lumber: FSC Certified; PS 20; Graded in accordance with AWI Custom; species as indicated below; smooth sawn, maximum moisture content of 6 percent;

1. Hook Strips, shelf cleats, etc.: yellow pine.

B. Hardwood Lumber: Graded in accordance with AWI Custom.

1. Opaque Finish: Open or closed grain species suitable for opaque finish, plain sawn, maximum moisture content of 8 percent.

2. Transparent Finish: Select White birch, except as otherwise noted, rotary cut, maximum moisture content of 8 percent.
2.2 SHEET MATERIALS

A. All composite wood and agrifiber products installed in the building interior (defined as inside of the weatherproofing system and applied on-site) shall meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Chambers (2004) including 2004 Addenda.

B. Softwood Plywood: PS 1 Grade A-C; Graded in accordance with AWI Custom; veneer core; fir face species.

C. Hardwood Plywood: AWI Grade A veneer; veneer core; type of glue recommended for application; and the following:
   1. Species of Veneer: Select White birch.
   2. Cut or Slicing of Veneer: Rotary.
   3. Matching of Individual Leaves to Each Other: Book matching.

2.3 ACCESSORIES

A. Nails: Size and type to suit application; galvanized for exterior, high humidity, and treated wood locations, plain finish at other interior locations.

B. Bolts, Nuts, Washers, Lags and Screws: Size and type to suit application/ non-corrosive for high humidity, and treated wood locations; plain finish at other interior locations.

C. Edge Banding: Hardwood, open or closed grain suitable for opaque finish; of width to match component thickness.

2.4 SHOP TREATMENT OF WOOD MATERIALS

A. Shop pressure treat wood materials requiring pressure impregnated preservatives to AWPB LP-2, C.25.

B. Re-dry wood after pressure treatment to maximum 6 percent moisture content.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set and secure materials and components in place, plumb and level. Use accurately cut scribes to fit Work to walls.

B. One exposed face, blind nail where possible. Set Finishing nails to receive putty.

C. Hammer marks not acceptable on any exposed finished surface and may be cause for rejection of Work by Architect.

D. Install running woodwork in single lengths whenever material is obtainable in required lengths; otherwise, install in as long lengths as obtainable. Make joints only where solid fastenings can be made.
E. Verify that mechanical, electrical and building items affecting this Section are in place and ready to receive this Work.

F. Fit exposed edges of plywood shelving and site-made casework with 3/8 inch thick hardwood edging. Width is thickness of plywood.

3.2 SITE TREATMENT OF WOOD MATERIALS

A. Brush apply one coat of preservative treatment on cut surfaces of finish carpentry items which will be in contact with cementitious surfaces at exterior wall construction.

B. Apply preservative treatment in accordance with manufacturer's instructions.

C. Treat site-sawn ends. Allow preservative to cure prior to erecting materials.

D. Verify materials requiring paint finish do not exceed 6 percent moisture content before applying fire retardant or wood preservative treatment.

E. Prime paint surfaces of items or assemblies in contact with cementitious materials. Refer to Section 09 91 00 - Painting for primer material, surface preparation and application procedures.

3.3 PREPARATION FOR FINISHING

A. Sand work smooth and set exposed nails and screws. Apply wood filler in exposed nail and screw indentations.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Special Fabricated Cabinet Units.
B. Plastic Laminate Countertops.
C. Surfaces Prepared for Site Finishing.
D. Preparation for Utilities.
E. Cabinet Hardware.

1.2 RELATED SECTIONS
A. Section 06 10 00 – Rough Carpentry: Wood Blocking and Curbing.
B. Section 06 20 00 – Finish Carpentry.
C. Section 08 71 00 – Door Hardware: Hardware other than specified in this Section.
D. Section 08 81 00 – Glass and Glazing
E. Section 09 65 00 – Resilient Flooring: Rubber base installation at base of millwork.
F. Section 09 91 00 – Painting.
G. Section 12 35 53 – Laboratory Casework.
H. Division 22 – Mechanical: Plumbing Fixtures.
I. Division 26 – Electrical: Electrical Components.
J. Division 27 – Communications.

1.3 REFERENCES
A. ANSI/BHMA A156.9 - Cabinet Hardware.
B. AWI - Quality Standards.
E. NEMA LD3-High Pressure Decorative Laminates.
F. PS-1 - Construction and Industrial Plywood.

1.4 QUALITY ASSURANCE
A. Composite wood and agrifiber products used in casework construction shall meet requirements of the California Air Resources Board (CARB) Airborne Toxic Control
Measure (ATCM) to Reduce Formaldehyde Emissions from Composite Wood Products (Section 93120-93120.12, Title 17, California Code of Regulations).

B. Perform Work in accordance with "Quality Standards" of the Architectural Woodwork Institute (AWI); custom grade. All exposed wood to receive clear finish shall be "clear face", free of knots, not finger jointed, no worm holes, no sap wood or gum spots.

C. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos -free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 SUBMITTALS

A. Submit shop drawings and product date under provisions of Section 01 33 00.

B. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings and schedule of finishes. Show details at minimum scale of 1-1/2 inch to one foot, plans and elevations at minimum scale of 1/2 inch to one foot.

C. Submit evidence of compliance with CARB for composite wood and agrifiber products.

D. Submit two samples, 6 x 6 inches in size, illustrating range of each specified finish and color of each specified material.

1.6 MOCKUP

A. Section 01 40 00 - Quality Control: Mockup requirements.

B. Construct mockup of full size base cabinet and upper cabinet including hardware, accessories, and fitments.

C. Mockup shall reflect all proposed substitution items in order for Architect and Owner to determine acceptability.

D. Locate where directed by Architect.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.
1.8  DELIVERY, STORAGE AND HANDLING
A. Deliver, store, handle and protect products under provisions of Section 01 60 00.
B. Protect products during transit, delivery, storage and handling to prevent damage.
C. No cracked, chipped, broken, stained or defective material will be accepted.
D. Store products within dry, enclosed area.

1.9  ENVIRONMENTAL REQUIREMENTS
A. Maintain minimum temperature of 60 degrees F. continuously beginning 48 hours prior to installation.

1.10 FIELD MEASUREMENTS
A. Verify all dimensions by taking field measurement; proper fit and attachment of all parts is required.

1.11 COORDINATION
A. Coordinate the Work of this Section with other Sections whose Work will affect or be affected by this Work.

PART 2 - PRODUCTS

2.1 ACCEPTABLE CASEWORK MANUFACTURERS
A. Imperial Mill & Fixtures.
B. Millennia Cabinetry, Inc.
C. Terrill Manufacturing Company.
D. Timber Casework.
E. Substitutions: Under provisions of Section 01 60 00.

2.2 WOOD MATERIALS
A. Softwood Lumber: PS 20; graded in accordance with AWI; maximum moisture content of 6 percent; Yellow Pine.
B. Hardwood Lumber: NHLA, graded in accordance with AWI Custom; maximum moisture content 6 percent; natural birch, rotary cut, unless otherwise indicated.
C. Standing and Running Trim: AWI Section 300, Custom Grade, Select White Birch, plain sliced.
2.3 SHEET MATERIALS

A. All composite wood and agrifiber products installed in the building interior (defined as inside of the weatherproofing system and applied on-site) shall meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Chambers (2004) including 2004 Addenda.

B. Softwood Plywood: PS-1; grade A veneer in accordance with AWI; Exterior Type; Fir Species; veneer core material.

C. Hardwood Plywood: PS 51; graded in accordance with AWI; core material of veneer, type of glue recommended for application; face veneer and cuts shall be rotary cut select white birch, custom grade, suitable for transparent finish.

D. Wood Fiberboard: AWI standard, minimum 45 lb. Fiberboard (MDF) core composed of wood chips, medium density, made with high waterproof resin binders; of grade to suit application; sanded faces.

E. Particleboard is not permitted.

2.4 HARDWOOD VENEER CABINETS and STORAGE SHELVING

A. Quality Standard: Comply with AWI Section 10, Custom Grade, requirements for hardwood veneer cabinets and storage shelving and as specified below.

B. AWI Type of Cabinet Construction: Flush overlay.

C. Materials for Exposed and Semi-exposed Surfaces: Provide surface materials indicated below:
   1. Surfaces Other than Drawer Bodies and Doors: Hardwood veneer on MDF board or plywood.
   2. Cabinet Doors and large panels: Hardwood veneer on MDF or composite core. Plywood not permitted. Doors 24 inches or wider and 80 inches or taller shall be 1 inch composite core or 1-3/8 inch hollow core, door quality construction.
   3. Drawer Sides and Backs: Solid hardwood lumber, shop finished.
   4. Drawer Bottoms: Hardwood plywood, shop finished. Hardboard is not acceptable.
   5. Edge banding: hardwood.
   6. Adjustable shelf supports shall be multiple holes, 5 mm diameter, 1 inch centers.

2.5 ACCEPTABLE LAMINATE MANUFACTURERS

A. Formica: Plastic Laminate.

B. Nevamar: Plastic Laminate.

C. Wilson Art: Plastic Laminate.

D. Substitutions: Under provisions of Section 01 60 00.
2.6 LAMINATE MATERIALS

A. Plastic Laminate (General): Low reflective textured surface finish; colors indicated in Finish Color Schedule, Section 09 99 50. Architect shall select colors from one of the manufacturers listed above.
   1. 0.050 inch thick general purpose grade.
   2. 0.042 inch thick post forming grade.
   3. 0.030 inch thick vertical grade.

B. Laminate Backing Sheet: LD3 BK20 Backing Grade, undecorated plastic laminate; smooth surface finish.

2.7 ACCESSORIES

A. Metal Stud Base: ASTM A653 Coating Class C, non-load bearing rolled steel, channel shaped, as follows:
   1. Depth: 3-5/8 inch, except as otherwise noted on Drawings.
   2. Thickness: 16 gauge.

B. Adhesive: As recommended by manufacturer; low emitting VOC in accordance with the current VOC content limits of South Coast Air Quality Mgt. District (SCAQMD) Rule #1168.

C. Fastener: Corrosion resistant; size and type best suited for intended application.

D. Bolts, Nuts, Washers, Lags, Pins and Screws; size and type best suited for intended application.

E. Concealed Joint Fasteners: Threaded steel.

2.8 HARDWARE

A. Cabinet Hardware:
   2. Drawer and Door Pulls: Satin anodized aluminum wire pulls with 4" hole spacing. Stanley #4484.
   5. Drawer and Door Locks: Best 5L7RL2626 or Olympus 721 series with interchange-able cores, 626 finish.
      a. Furnish but Do Not install cores.
      b. Coordinate with lock manufacturer to provide cores (#1C7TD2626) for the entire hardware package including cabinet locks. Cores shall be combinated to the NISD Grand Master System. Coordinate keying for all locks to be the same within the same room.
   6. Door Silencers: Hafele 356.25.410, or approved equal.
8. Magnetic Catch: Aluminum; EPCO 592, or approved equal.
9. Elbow Catch: Chrome; EPCO 1018N, or approved equal.
10. Coat Hooks: Chrome, Amerock BP3460-26, or approved equal.
11. Hanging Rods: Chrome; Omaha Fixtures or approved equal.
12. Mirror: 1/4 inch thick; Quality q2, clear float glass; full silver coating, copper coating and organic coating; size as indicated.
13. Mirror Clips: Clear plastic; Outwater Plastics R45-283CL, or approved equal.

B. Workstation Brackets: Steel; A&M Hardware, or approved equal.
1. Provide 18 by 24 inch size for 24 inch countertops.
2. Provide 24 by 24 inch size for 30 inch countertops.

C. Keyboard and Mouse Tray: K&V #5710, 75 lb. class, black.

2.9 FABRICATION
A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
B. Coordinate mounting of casework on metal stud base. No wood material shall be located within 3 inches of finish floor.
C. Fit shelves, doors and exposed edges with 3 mm matching hardwood edging. Use full length pieces only.
D. Door and Drawer Fronts: 3/4 inch thick, flush overlay style.
E. Post-form countertops except as otherwise indicated.
F. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
G. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
H. Cap exposed plastic laminate edges with material of same finish and pattern.
I. Mechanically fasten splashbacks to countertops with steel brackets at 16 inches on center.
J. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures and fittings.
K. Coordinate installation of electrical components supplied as Work of other Sections.

2.10 FACTORY FINISHING
A. Sand work smooth and set exposed nails.
B. Apply wood filler in exposed nail indentations.
C. On items to receive transparent finishes, use wood filler matching surrounding surfaces and of types recommended for applied finishes.
D. Finish hardwood veneer units in accordance with AWI - Section 1500 Factory Finishing; Custom; Clear Transparent Type:
   1. UV Cured Polyurethane or UV Cured Modified Acrylate.

E. Seal, stain and varnish all concealed and semi-concealed surfaces not indicated to have other finish or not pre-finished.

F. Seal internal surface of cabinets not indicated to have other finish with two coats clear finish. Brush apply only.

G. Seal surfaces in contact with cementitious materials.

H. Backpriming: Apply one coat of sealer or primer compatible with finish coats to concealed surfaces of woodwork, including backs of trim, cabinets, paneling, and ornamental work and the underside of countertops. Apply 2 coats to back of paneling. Concealed surfaces of plastic laminate-clad woodwork do not require backpriming when backed with plastic laminate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical and electrical items affecting this Section are placed and ready to receive this Work.

C. Beginning installation means acceptance of existing conditions.

3.2 PREPARATION

A. Protect adjacent Work from damage.

B. Coordinate locations for conduit, receptacles, switches, CRT, phone and other mechanical/electrical devices.

C. Coordinate mounting of casework on metal stud base. No wood material shall be located within 3 inches of finish floor.

3.3 INSTALLATION

A. Set and secure casework in place rigid, plumb, and level.

B. Use purpose designed fixture attachments at concealed locations for wall mounted components.

C. Use threaded steel concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
D. Carefully scribe casework which is against other building materials, leaving gaps of 1/32 inch maximum. Do not use additional overlay trim for this purpose.

E. Secure cabinet and counter bases to floor using appropriate angles and anchorages.

F. Countersink anchorage devices at exposed locations used to wall mount components and conceal with solid plugs of species to match surrounding wood. Finish flush with surrounding surfaces.

3.4 ADJUSTING AND CLEANING

A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.

B. Clean casework, counters, sleeves, hardware, fittings and fixtures.

C. Ensure all metal stud base is concealed with rubber base.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide continuous insulation, vapor retarder, air barrier, and water barrier at the exterior wall assemblies, NFPA 285 Compliant for all veneers (masonry, stone, stucco and metal facades):
   1. Metal facades on steel stud or concrete masonry unit back-up walls
   2. Brick cavity wall on steel stud or concrete masonry unit back-up walls
   3. Cement plaster exterior finish on steel stud or concrete masonry unit back-up

B. Note: Vapor barrier materials and installation may be included in this specification, however, specification of vapor barrier to be determined by hygrothermal analysis.

C. Section Includes:
   1. Aluminum Foil Clad Foam-Plastic Board Insulation

D. Related Sections:
   1. Section 04 20 00 – Unit Masonry Assemblies.
   2. Section 07 27 20 – Fluid Applied Liquid Air Barriers.
   3. Section 07 65 00 – Thru-Wall Flexible Flashing and Drainage System.
   4. Section 07 84 00 – Fire Stopping.

1.3 REFERENCES

A. Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation ASTM C203

B. Test Method for Compressive Properties of Rigid Cellular Plasctics ASTM D1621

C. Test Method for Apparent Density of Rigid Cellular Plastics ASTM D1622

D. Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging ASTM D2126

E. Test Method for Water Vapor Transmission of Materials ASTM E96/E96M


1.4 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Submit Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product verifying qualities of insulation components meet or exceed specified requirements.

C. Submit Field Inspection and Field-Testing Reports in accordance with Field Quality Control requirements.

D. Manufacturers printed installation instructions for each type of material to be used.

E. Submit Material Safety Data Sheets (MSDS) for each type of insulation to be used.

F. Samples: Submit the following material samples:
   1. 12 inches square insulation panels of each type and thickness of insulation specified
   2. Thru-wall flashing minimum of 12 inches long and of width specified

G. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES

1.5 QUALITY ASSURANCE

A. Source Limitations: Provide each type of building insulation and related accessories from one single manufacturer.

B. Installer Qualifications:
   1. Contractor shall provide evidence of having completed 3 projects of similar size and scope in the past 3 years.
   2. Contractor shall provide evidence of certification by the rigid insulation manufacturer as having been properly trained in the proper installation of the submitted products.

C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

D. Assembly Fire Propagation Characteristics: Provide results of tests performed on wall assemblies tested by manufacturer in accordance with NFPA 285.

E. Pre-installation Meeting: Prior to start of insulation installation review and document insulation installation methods and procedures including:
   1. Participants
   2. Substrate conditions
   3. Manufacturers installation guidelines
   4. Construction schedule
   5. Governing regulatory requirements and requirements for insurance
   6. Review field quality control procedures

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project Site before installation time.
   3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.
PART 2 - PRODUCTS

A. Foil-Faced, Polyisocyanurate Board Insulation: ASTM C1289, Type I, Class 1, with maximum flame-spread and smoke-developed indexes of ≤ 25 and ≤ 450, respectively, per ASTM E84.
   1. Minimum Compressive Strength ≥25 psi when tested per ASTM D1621
   2. Minimum Tensile Strength ≥1000 when tested per ASTM C209
   3. Minimum Flexural Strength ≥40 psi when tested per ASTM C203
   4. Water Vapor Transmission ≤0.03 perms per inch when tested per ASTM E96
   5. Water Absorption Maximum ≤1 percent by volume when tested per ASTM C209
   6. Dimensional Stability, Maximum ≤0.05 percent length and width, and ≤3.5 percent thickness when tested per ASTM D2126
   7. R-value per thickness: 1.6 inches = R-10.2.

B. Products: Subject to compliance with requirements, provide the following:
   1. Firestone Building Products; Enverge CI Foil Exterior Wall Insulation (Chris Tobias, Product Development Manager, 317-575-7285)
   2. Dow Chemical, Thermax.

C. Recycled Content: Pre-consumer recycled content not less than 3.4 percent

D. Adhesive for Bonding Insulation: Polyurethane construction adhesive with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates and as recommended by insulation manufacturer. Acceptable products include:
   1. LT-100 STS Coatings (www.stscoatings.com)
   2. Architect’s approved equal.

2.2 INSULATION FASTENERS

A. For mechanical attachment over wood or steel framing provide the following as applicable:
   1. Rodenhouse Grip-Loc® Auto Feed fastening system fasteners of length long enough to penetrate framing a minimum of 1 inch.
   2. Rodenhouse Thermal Grip® ci washers with Grip Deck fasteners of length long enough to penetrate framing a minimum of 1 inch.
   3. Wind Lock Wind Devil plastic washer with coated fasteners of length long enough to penetrate framing a minimum of 1 inch.

B. For mechanical attachment over masonry and concrete back-up provide the following:
   1. Rodenhouse Inc. Plasti-Grip® PMF fasteners.

C. Adhesive:
   1. Polyether construction adhesive: LT-100 STS Coatings or approved equal.

D. Insulation Board Joint Tape: Aluminum foil tape approved by insulation board manufacturer. Acceptable products include:
   1. 4 inch wide Shurtape AF100 manufactured by Shurtape Technologies, LLC
   2. 4 inch and 6 inch wide Shurtape AF975 manufactured by Shurtape Technologies, LLC

E. Sealant: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates and a demonstrated compatibility with adjacent wall components and flashings. Acceptable products include:
   1. Elastomeric Compatible System
   2. Elastomeric Sealer as manufactured by Firestone Building Products LLC
   3. LT-100 STS Coatings
PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation including removing projections capable of puncturing foil facer, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Install insulation with the long edge horizontal and either side to the exterior.
B. Install in as large of pieces as possible to minimize joints.
C. Offset successive courses of insulation by a minimum of one stud space in framed installations or 16 inches in solid back-up installations.
D. Abut wall insulation tightly together both horizontally and vertically, and at all openings.
E. Comply with insulation manufacturer's written installation instructions.
F. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
G. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
H. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths.
I. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
   1. Stagger successive layers a minimum of 16 inches both vertically and horizontally so joints in successive layers do not align.

3.3 INSTALLATION ON MASONRY BACK-UP

A. Adhesive Installation:
   1. Install pads of adhesive spaced approximately 24 inches on center both ways on inside face, and as recommended by adhesive manufacturer.
   2. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
   3. Supplement adhesive attachment of insulation by securing boards with plastic masonry fasteners at 24 inches on center both horizontal and vertical.

B. Mechanical Fastener Installation:
   1. Fasten insulation to back-up using manufacturer’s acceptable integral plastic washers and fasteners as applicable for type of back-up and insulation thickness.
   2. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
   3. Install field fasteners at 12 inches on center vertically and 16 inches on center horizontally.
   4. Install edge fasteners at 12 inches on center around perimeter of each board.
3.4 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Comply with manufacturer's written instructions.

B. Fasten insulation to framing using manufacturer's acceptable screws and washers as applicable for type of framing.
   1. Install field fasteners at 12 inches on center vertically and 16 inches on center horizontally.
   2. Install edge fasteners at 12 inches on center around perimeter of each board.

3.5 AIR BARRIER INSTALLATION

A. Use manufacturer's acceptable 4" wide aluminum foil tape to seal all:
   1. Board-to-board joints.
   2. Fastener heads.

B. Install 6" wide aluminum foil tape to seal:
   1. all end joints
   2. all thru-wall penetrations such as windows, doors or pipe penetrations
   3. all joints between exterior wall insulation and adjacent air barrier materials

3.6 VAPOR RETARDER SYSTEM

A. Use manufacturer's acceptable 4" wide aluminum foil tape to seal
   1. all board-to-board joints
   2. all fastener heads

B. Use manufacturer's acceptable 6" wide aluminum foil tape to seal all:
   1. end joints
   2. thru-wall penetrations such as windows, doors or pipe penetrations
   3. joints between exterior wall insulation and adjacent vapor retarder materials

3.7 FOR WATER BARRIER INSTALLATIONS

A. Use manufacturer's acceptable, compatible membrane flashing to seal all:
   1. joints between continuous insulation and adjacent materials
   2. Interruptions of the water barrier such as at the base of the wall, over windowsills, window and door heads, shelf angles and duct penetrations
   3. joints between the water barrier and roofing materials

B. Manufacturer's acceptable 4" wide aluminum foil tape in a shiplap configuration to seal all:
   1. board-to-board joints
   2. fastener heads

C. Manufacturer's acceptable 6" wide aluminum foil tape in a shiplap configuration to seal all:
   1. end joints
   2. thru-wall penetrations such as window and door jambs, pipe and duct penetrations

3.8 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.
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B. Do not leave continuous insulation uncovered and exposed to UV for longer than an aggregate of 60 days between storage and uncovered installation.

3.9 PROJECT CLEAN UP

A. Removal all packaging and properly recycle.

B. Remove all scrap materials and properly dispose of offsite.

END OF SECTION
SECTION 07 21 11
BATT INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Batt insulation for filling crevices in exterior wall and roof.

1.2 RELATED SECTIONS
A. Section 01 35 63 – Sustainable Design.
B. Section 07 21 00 – Continuous Thermal Insulation: Cavity wall insulation.
C. Section 07 22 00 – Roof Insulation.
D. Section 09 21 16 – Gypsum Wallboard Systems: Sound attenuation blankets.

1.3 REFERENCES
B. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.
C. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.
E. GREENGUARD Environmental Institute:
   1. GREenguard Gold Children and Schools Certification Program.
F. Scientific Certification Systems:
   1. SCS EC10.2 - Environmental Certification Program Indoor Air Quality Performance.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 33 00.
B. Product Data: Indicate manufacturer and technical data.
C. Submit manufacturer's certificate that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE
A. Products shall be GreenGuard Indoor Air Quality and SCS certified with minimum 20 percent average recycle content.
B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product...
contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, handle and protect products under provisions of Section 01 60 00.
B. Deliver materials to job in manufacturer's original unopened packaging. Adequately protect against damage while stored at the site. Deliver so that stocks of materials on the site will permit uninterrupted progress of the Work.

1.7 COORDINATION

A. Coordinate Work under provisions of Section 01 26 00.
B. Check Work of other trades which abuts, adjoins or is affected by Work under this Section. Consult Drawings and other Sections and expedite and coordinate Work to avoid omissions and delays.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Batt Insulation:
   1. CertainTeed Corporation.
   2. Owens-Corning Fiberglas Corporation.
   3. USG Interiors, Inc.
B. Substitutions: Under provisions of Section 01 60 00.

2.2 BATT INSULATION

A. Insulation Batts shall be fiberglass or spun mineral fiber and resinous binders formed into flexible blankets or matts.
   1. Facing: Vapor barrier FSK - faced.
   2. Comply with ASTM C665, Type III, Class A.
   3. Batt Size: 16 inches wide x 96 inches long.
   4. Thermal Resistance Value: R value of 19 at roof or ceiling locations; R value of 13 at exterior walls.
B. Pressure Sensitive Tape: Permanent type as recommended by insulation manufacturer.
C. Tie Wire: Minimum 16 gauge aluminum or other non-ferrous material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all surfaces to receive Work of this Section.
B. Report in writing conditions detrimental to Work of this Section.
C. Beginning installation means acceptance of existing conditions.

3.2 BATT INSULATION INSTALLATION

A. Butt joints tightly. Cut to fit around obstructions.

B. Apply with vapor barrier on the warm-in-winter (interior) side, fit snug between studs and tape in place.

C. Attach to channel frame work or substrate with wire spring clips; between framing members in framed walls by friction fit, and with supplementary tape or tie wire when applied in heights over 8 feet. Fit around obstructions.

3.3 PROTECTION

A. Protect all insulation, both during and after installation, from damage of any kind. Replace all damaged insulation at no cost to the Owner.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Polyisocyanurate board insulation.
2. Roof cover board.
3. Insulation fasteners.
4. Insulation adhesive.
5. Fiber cant strips.

B. Related Sections
1. Section 06 10 50 - Roof Carpentry
2. Section 07 52 16 - Modified Bitumen Roof System
3. Section 07 52 20 - Roofing Installer’s Warranty
4. Section 07 62 00 - Flashing and Sheet Metal

1.3 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

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

E. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
1. Tapered insulation, including slopes.
2. Crickets, saddles, and tapered edge strips, including slopes.
3. Insulation fastening patterns for corner, perimeter, and field-of-roof locations along with documented evidence that patterns meet wind uplift criteria from latest version of ASCE 7 and FM standards.

F. Submit specified manufacturer’s letters and certificates.

1.4 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, approval or listing agency markings, and directions for storing and mixing with other components.
1. Inspect for damage.
2. Store products in weather protected environment, clear of ground and moisture.
3. Deliver materials in quantities to allow continuity of application throughout the Project.
4. Coordinate shipment receipt as necessary to cause Owner least amount of interference in Owner’s operations. Owner will not take responsibility for product deliveries.

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.
   1. Store materials subject to water damage in fully enclosed, watertight storage trailers.
   2. Do not store insulation materials on the roof overnight.
   3. Store materials on the roof surfaces only on the morning they will be installed. Do not store more materials on roof overnight unless approved by the Architect.
   4. Maximum Allowable Loading on Roof: 20 pounds per square foot.

D. Handle materials in a manner precluding damage and contamination by moisture or other harmful/foreign matter.

E. Promptly mark, remove from the site, and discard any materials contaminated by moisture.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Provide installed insulation and/or base sheet that withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Roof System Design: Provide a roofing system that meets or exceeds the wind uplift pressures shown on the drawings.

D. Approval Standards: Meet testing standards of FM 4450 and FM 4470.

1.6 JOB CONDITIONS

A. Do not apply any portion of the roof system or its accessories during precipitation, or start application in the event precipitation is threatening, unless proper precautions have been taken.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not apply insulation during inclement weather. Temperatures must be a minimum of 40°F Fahrenheit and rising. Do not apply insulation material to damp or frozen deck or substrate.

B. Do not apply insulation when the wind is determined to be detrimental to safe installation practices.

1.8 WARRANTY

A. The manufacturer of the insulation shall be approved in writing by the manufacturer of the roof membrane system. Submit manufacturer’s letter.

B. Include insulation as part of 20-year NDL warranty required for the overall roofing system.
PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Insulation Board:
   1. Rigid flat and tapered polyisocyanurate foam insulation board, meeting ASTM C-1289, Type II, Class 2, Grade 2 with in-organic insulation board facers.
   2. Sizes:
      a. 48 inches x 96 inches maximum where mechanically fastened.
      b. 48 inches x 48 inches maximum where adhesively applied.
   3. Board thickness: As shown on the Drawings. Minimum base layer thickness shall be 2 inches.
   4. Tapered insulation slope: As shown on the Drawings.
   5. R-value: Minimum R-25

C. Crickets: Provide factory tapered polyisocyanurate insulation boards with the same characteristics as Article 2.1.B above.
   1. Minimum 1/2-inch per foot slope. Widths of crickets and saddles shall not be less than 1/3 their lengths, unless otherwise shown on Drawings.

D. Roof Cover Board:
   1. Acceptable Materials:
   2. Thickness:
      a. Over Field of Roof Insulation: 1/2-inch thickness.
      b. Over Cants, Roof Curbs & Vertical Surfaces: 1/4-inch thickness.
      c. Over Metal Decks at Canopies: 5/8-inch thickness.
   3. Board Size:
      a. 48-inches x 96-inches where mechanically fastened.
      b. 48-inches x 48-inches where adhesively applied.
   4. Miter edges of ¼-inch roof board strips at tops and bottoms of cants.

E. Cant Strips:
   1. Fire-retardant wood fiber or perlite, meeting ASTM C-728.
   2. Size: 1.5 inches thick minimum x 4 inches face minimum.

2.2 RELATED MATERIALS

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing

B. Asphalt Primer: Asphalt cut-back type primer manufactured in accordance with ASTM D-41 standards and without asbestos, for use on masonry, metal and other surfaces.

C. Fasteners for Metal Decks: Coated steel insulation screws, using metal disks, and of sufficient length for proper penetration of roof deck in all instances.

D. Insulation Adhesive: For use in adhering fiber cant strips and gypsum cover board at curbs and other vertical flashing surfaces:
   1. Olybond 500 or as recommended by roofing membrane manufacturer.
PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. Verify that surfaces and site conditions are ready to receive work and that deck is supported and secured.

B. Verify the deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains or eaves.

C. Verify that deck surfaces are dry and free of snow or ice. Verify flutes of metal deck are clean and dry. Confirm deck dryness by moisture meter; maximum allowable: 12-percent.

D. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through the roof are solidly set and wood nailing strips are in place.

E. Beginning of installation means installer accepts existing surfaces.

3.2 INSULATION INSTALLATION

A. Base Layer Application at Metal Decks: Install base layer of insulation with end joints staggered not less than 12 inches in adjacent rows and with long joints continuous at right angles to the flutes.
   1. Locate end joints over crests of decking.
   2. Trim insulation neatly to fit around penetrations and projections, and to fit intersecting sloping roof decks.
   3. Maximum joint width between adjacent boards shall be not more than 1/4-inch. Fill larger gaps with insulation.
   4. Cut and fit insulation within 1/4-inch of nailers, projections and penetrations.
   5. Do not install more board stock than can be covered during each day’s operation.
   6. Screws shall be of sufficient length to penetrate the existing or new metal deck by approximately 1 inch. Extra-long screws are not permitted.
   7. Mechanical fastening shall be in accordance with ASCE 7 and FM Class 90 requirements and approved shop drawings.
   8. Base layer thickness shall not exceed 2.5 inches.

B. Upper Layer Application: Install upper layers of insulation and cover board with longitudinal and transverse joints of each layer offset not less than 12 inches from previous layer.
   1. Adhere each upper layer of insulation and cover board using adhesive.
   2. Place, fit and trim upper layers of insulation as required for base layer.
   3. Set each layer of insulation in ribbons of bead-applied insulation adhesive or full-spread adhesive, firmly pressing and maintaining insulation in place.
   4. Space adhesive ribbons to achieve wind uplift pressures shown on the drawings and in accordance with ASCE 7 and FM Class 90 requirements and approved shop drawings.

C. Cricket Installation:
   1. Apply solidly in full embedment of low-rise foam adhesive.
   2. Slope materials a minimum of twice the slope of the aggregate roof slope over which crickets and saddles are installed.
   3. Extend cricket widths not less than 1/3 their lengths, unless otherwise detailed.

D. All insulation shall be laid in full sheets wherever possible, and carefully fitted and pushed against adjoining sheets or nailers, to form a tight joint.
   1. Butt insulation boards tightly together.
   2. Walk-in all boards to ensure solid adhesion.
   3. Stagger joints between adjacent boards and subsequent layers.
   4. Fill open joints with tightly-fit pieces of matching roof insulation.
5. Miter edges of insulation boards at all ridges and elsewhere to prevent open or irregular joints.

6. Do not install more insulation than can be covered during each day's operation.

3.3 COVER BOARD INSTALLATION

A. Installation shall comply with roof insulation guidelines stipulated above.

B. Over Field of Insulation: Fully adhere 1/2-inch thick roof cover board and comply with ASCE 7 and FM requirements stipulated for roof insulation.

C. Over Metal Deck at Canopies: Mechanically fasten 5/8-inch thick roof cover board with end joints staggered not less than 12 inches in adjacent rows and with long joints continuous at right angles to the flutes. Mechanical fastening shall be in accordance with ASCE 7 and FM Class 90 requirements and approved shop drawings.

D. Miter cover board edges where ridges are formed at tops and bottoms of crickets, to prevent open or irregular joints.

E. Cover cants, roof curbs and vertical surfaces where indicated with 1/4-inch roof cover board.
   1. Mechanically fasten to wood blocking with galvanized ring shank cap nails.
   2. Set in full embedment of low-rise foam adhesive at non-nailable substrates.

F. Leave surfaces clean in preparation for roof membrane installation.

3.4 PROTECTION

A. Protect installed insulation and cover board from damage due to harmful weather exposures, physical abuse, and other causes.

B. 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
SECTION 07 27 20
FLUID-APPLIED AIR BARRIER ASSEMBLY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Materials and installation methods supplementing a one-component vapor permeable, liquid applied elastic air and water barrier.

B. Materials and installation to bridge and seal the following air leakage pathways and gaps:
   1. Connections of the walls to the roof air barrier.
   2. Connections of the walls to the foundations.
   3. Expansion joints.
   4. Openings and penetrations of window frames, store front, curtain wall.
   5. Barrier metal panels and other envelope assembly.
   6. Door frames.
   7. Piping, conduit, duct and similar penetrations.
   8. Masonry ties, screws, bolts and similar penetrations.
   9. All other air leakage pathways in the building envelope.
  10. Sealing flashing to wall surface.

1.2 RELATED SECTIONS

A. Section 04 20 00 – Unit Masonry Assemblies: Flexible through wall flashing membrane. Seal flashing to wall surface.

B. Section 06 10 50 – Roof Carpentry: Covering preservative-treated materials with self-adhering membranes.


D. Section 07 92 00 – Joint Protection: Sealants.

1.3 PERFORMANCE REFERENCES


B. ASTM E 2357, Standard Test Method for Determining Air Leakage of Air Barrier Assembly


F. AATCC 127 Water Resistance

G. ASTM D 1970, Self Sealability
H. ICC-ES AC212, Freeze Thaw, Crack Bridging

I. CODE MANDATED Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.

J. ASTM E84, Standard Test Method for Surface Burning

K. Listed as an evaluated system by Air Barrier Association of America; www.airbarrier.org.

1.4 PERFORMANCE REQUIREMENTS

A. Provide an air barrier system constructed to perform as a continuous elastic air barrier, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.

1. The air barrier shall have the following characteristics:
   a. It must be continuous, with all joints made air-tight.
   b. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent assembly, allowing for the relative movement of assembly due to thermal and moisture variations and creep. Connection shall be made between:
      1) Foundation and walls.
      2) Walls and windows or doors.
      3) Different wall assembly.
      4) Wall and roof.
      5) Wall and roof over unconditioned space.
      6) Walls, floor and roof across construction, control and expansion joints.
      7) Walls, floors and roof to utility, pipe and duct penetrations.
      8) Flashing to wall surface.

2. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air-tight.

3. Air Permeability: Maximum 0.04 cfm/sq.ft. @ 10.5 psf per ASTM E283.

4. Air Permeability: @ delta P of 0.3 inches water...0.002 CFM/ft² per ASTM E 2178

5. ASTM E2357, Full Scale Wall Testing of the Air Barrier System
   a. System Air Leakage, Requirement – 0.0008 CFM/ft² maximum
   b. Penetration Check, Requirement – 0.00088 CFM/ft² maximum

6. ASTM E96 Water Vapor Permeance: 10-20 Perms per Procedure B


8. Elongation: Minimum 50 percent per ASTM D412.

9. AATC 127 Water Resistance – Pass

10. ASTM D 1970 Self Sealability – Pass

11. ICC-ES AC212, Freeze Thaw, Crack Bridging – Pass

12. Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.

13. ASTM E84 Class A Fire Resistant

14. Listed as an evaluated assembly by the Air Barrier Association of America; www.airbarrier.org.
1.5 **SUBMITTALS**

A. Section 01 33 00 – Submittal Procedures: Submittal Procedures.

B. Prior to commencing the Work, submit manufacturer’s independent Laboratory Report for the Air Barrier Assembly testing on ASTM E 2357 tested on a steel stud frame wall, results are to be based on Specimen 2 testing only.

C. Prior to commencing the Work, submit documentation certifying that the air barrier system has been tested independently, indicating compliance with the performance requirements of the Air Barrier Association of Association.

D. Prior to commencing the Work, submit copies of manufacturers’ literature for the system, membrane, primers, sealants, adhesives and associated auxiliary materials shall be included as parts of the system that is listed by the Air Barrier Association of America evaluation.

E. Prior to commencing the Work, submit references clearly indicating that the materials proposed have been installed for not less than three years on projects of similar scope and nature.

F. Prior to commencing the Work, submit manufacturers’ complete set of standard details for air barrier/vapor retarders. The manufacturer’s representative shall review the contract drawings and note any modifications required to make the system air and water tight.

1.6 **QUALITY ASSURANCE**

A. Manufacturer’s Qualifications: Provide primary products, including each component of the air barrier membrane system, which has been commercially available for a minimum of 3 years.

B. Submit in writing, a document stating that the applicator of the primary air barrier membrane specified in this section is recognized by the manufacturer as suitable for the execution of the Work.

C. Perform Work in accordance with the printed requirements of the air barrier manufacturer and this specification.

D. Maintain one copy of manufacturer instructions on site.

E. At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the air barrier membrane manufacturer’s representative.

F. Components used in this section shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, tapes and adhesives as listed as an evaluated air barrier assembly by the Air Barrier Association of America.

1.7 **MOCK-UP**

A. Construct mock-up in accordance with Section 01 40 00 – Quality Requirements: Requirements for a mock-up.

B. Provide mock-up of air barrier materials under provisions of Section 04 20 00 – Unit Masonry Assemblies.
C. Items to be incorporated in mock-up include:
   1. Where directed by Architect, construct typical exterior wall panel 8 feet long by 6 feet
      high, incorporating masonry veneer system, concrete masonry backup, wall ties,
      through wall flexible flashing, board insulation, aluminium window frame, showing air
      barrier membrane application details and transition membranes.

D. Allow 72 hours for inspection of mock-up by Architect before proceeding with air barrier work.

1.8 PRE-INSTALLATION CONFERENCE

A. Convene four weeks prior to commencing work of this section, under provisions of Section
   01 30 00 – Administrative Requirements: Pre-Installation Meeting. Attendance by the
   manufacturer’s representative along with the installer is mandatory.

B. Do not proceed with the installation of the air barrier membrane and the through wall flashing
   membrane prior to the pre-installation conference.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in undamaged and original packaging indicating the name of
   the manufacturer and product.

B. All pail goods shall bear the ABAA Evaluated Air Barrier label

C. Store roll materials on end in original packaging.

D. Keep all products stored at or above 40 degrees F. Apply to a substrate with a surface
   temperature of 40 degrees F and rising. Do not allow product to freeze.

E. Protect rolls from direct sunlight until ready for use.

F. Do not double stack pail goods.

1.10 COORDINATION

A. Ensure continuity of the air seal throughout the scope of this section.

PART 2 - PRODUCTS

2.1 MEMBRANES

A. Liquid air barrier: One component elastomeric membrane, spray, trowel or brush applied,
   having the following characteristics and have passed all evaluations by the Air Barrier
   Association of America (ABAA) and be listed on their web site as having passed all the
   evaluations:
   1. Air Barrier Material permeability test: Air Leakage per ASTM E2178, dry film, delta P
      of 0.3 inches of water, 0.002 +/- 10 percent.
   2. Air Barrier System Test on Full Scale Wall Assembly, ASTM E2357
      a. System Air Leakage, 0.0008 CFM/ft² +/- 10 percent
      b. Penetrations Check, MUST PASS ASTM E2357 requirements
   3. Water Vapor permeance: (704 ng/Pa.m².s.) 10 to 20 perms, ASTM E96 Method B.
   4. Elongation (ASTM D412: >50%)
   5. Low temperature flexibility and crack bridging: Pass – ICC-ES AC212
7. AATCC 127 Water Resistance – Pass
8. ASTM E84, Class A Fire Resistant
9. Recycle content > 20 percent

B. Acceptable Manufacturers
   1. STS Coatings, Wall Guardian FW-100A, non-asphaltic.
   2. Sika-Sarnafil, Sikagard 530, a non-asphaltic product

C. Transition Membrane, Self-Adhering: Polymer-based, sheet membrane complete with polyester facing, and having the following physical properties:
   1. Thickness: 35 mils min.
   2. Vapor permeance: < 0.1
   3. Low temperature flexibility: -20°F to CGSB 37-GP-56M;
   4. Elongation: > 90 percent to ASTM D412-modifed
   5. ASTM E331, 10 psf for 2 hours
   6. Acceptable material:
      a. UT-40 by STS Coatings for use with the FW-100 system.
      b. Others as recommended by manufacturer.

D. Contractor Qualifications:
   1. Contractor shall provide a manufacture’s letter stating that they have been trained and are approved to apply the manufacturers’ air barrier.
   2. OPTIONAL: An ABAA Certified Contractor, specific certification for liquid applied and approved by letter from the manufacturer.

2.2 PRIMER

A. Primer for self-adhering membranes: Synthetic polymer-based adhesive type, quick setting, having the following characteristics:
   1. Acceptable material: As manufactured and/or recommended by the Air Barrier System manufacturer. Note: Primer shall be compatible with specified exterior gypsum sheathing.
   2. Verify compatibility of self-adhering membranes with preservative treated materials specified in Section 06 10 00. Prime preservative treated materials as required using primer recommended by self-adhering membrane manufacturer or use the non-chemical thermally modified wood known as EcoPrem.

2.3 SEALANTS

A. Sealants shall be compatible with air barrier assembly and shall be approved by the air barrier manufacturer.

B. Products: STS Coatings LT-100 Liquid Tape for concealed applications only; Great Seal PE-150 for concealed and exposed applications.

C. Primers: As recommended by manufacturer for surfaces to be sealed.

D. Backer Rods: As recommended by sealant manufacturer.

E. Others as recommended by manufacturer.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

3.2 PREPARATION

A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrates to provide an even plane.

B. Mortar joints in concrete block and form tie holes/voids in poured concrete shall be filled flush and smooth and allowed to be cured for a minimum of 24 hours.

C. All joints between gypsum sheathing, roof board, masonry and concrete and other substrate joints up to 1/4” wide shall be treated:
   2. Others as recommended by approved manufacturer.

D. All joints between gypsum sheathing, roof board, masonry and concrete and other substrates wider than 1/4” shall be sealed with:
   1. UT-40, overlapping each side of joint a minimum of 3 inches
   2. Others as recommended by approved manufacturer

E. Install backer rod and sealant at the following joints:
   1. All expansion/control/erection joints between concrete wall panels.
   2. All expansion/control joints in concrete block back-up.
   3. All joints between concrete wall panels and concrete block back-up.

3.3 PRIMER FOR TRANSITION MEMBRANE (SELF-ADHERING TYPE ONLY)

A. Apply primer for self-adhering membranes at rate recommended by manufacturer.

B. Apply primer to all areas to receive transition sheet membrane as indicated in Drawings by roller or spray and allow minimum 30 minute open time. Primed surfaces not covered by transition membrane during the same working day must be re-primed.

3.4 TRANSITION MEMBRANE (SELF-ADHERING TYPE)

A. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps unless otherwise noted.

B. Tie-in to roofing system and at the interface of dissimilar materials as indicated in Drawings.

C. Promptly roll all laps and membrane with a counter top roller to affect seal.

D. Ensure all preparatory work is complete prior to applying liquid membrane.

3.5 PRIMARY AIR BARRIER

A. Apply by spray or roller, a complete and continuous unbroken film at an ambient and substrate surface temperature of 40 degrees F and rising with less than a 30 percent chance of rain in
the next 18 hours and apply at the same rate as listed in the Air Barrier Association of America evaluation

1. Exterior Gypsum Sheathing, Plywood or OSB
   a. Wall Guardian FW-100A at a minimum of 2.5 gallons per 100 ft² (40 ft²/gallon) (40 wet mils).
   b. Others meeting stated ABAA approval coverage rates.
   c. Spray around all projections, including masonry veneer anchors, ensuring a complete and continuous air seal.

2. Concrete Masonry Unit (CMU), Concrete
   a. Wall Guardian FW-100A at a minimum of 2.5 gallons per 100 ft² (40 ft²/gallon) (equal to 40 wet mils on a smooth surface)
   b. Others meeting stated ABAA approval coverage rates
   c. Spray around all projections including masonry veneer anchors ensuring a complete and continuous air seal.

3.6 INSPECTION

A. Notify Architect when sections of work are complete so as to allow for review prior to installing insulation. The manufacturer’s representative shall be on site to review the installation along with the Architect.

3.7 PROTECTION OF FINISHED WORK

A. Liquid membranes are not designed for permanent exposure. Cover the liquid membrane, as recommended by the manufacturer, within the following time frames. Contractor shall verify the number of calendar days with the air barrier manufacturer:
   1. Cover the Wall Guardian material within 180 calendar days after installation.
   2. Transition membranes shall be covered within 180 days after installation.

B. Prepare, treat and seal vertical and horizontal surfaces at terminations and penetrations through the air barrier and at protrusions according to air barrier manufacturer’s written instructions.

3.8 SCHEDULE

A. Install liquid membrane system over the entire surface of the outer surface of the inner wythe of masonry, concrete columns and beams. Seal any masonry anchor penetrations air tight.

B. Install liquid membrane system over the entire surface of the exterior gypsum sheathing and/or roof board in the following area:
   1. Behind the metal wall and soffit panels.

C. Hollow Metal Door Frames: Seal door frame to wall surface with transition membrane.

D. Wall and Roof Junction: Seal wall to roof with transition membrane.

E. Seal joints in exterior sheathing with tape in the following areas:
   1. Cement plaster soffit.

F. Seal the top of sheathing to the underside of the roof assembly with foam or LT-100.

G. Openings: Seal around the perimeter of all openings with transition membrane.

H. Perimeter wood nailers at wall openings: Cover all exposed surfaces of wood nailers with transition membrane. Extend membrane over sheathing, masonry and metal framing as shown.
I. Aluminum window frames with nailing flanges: Seal the nailing flanges to the wall surface with transition membrane.

J. Aluminum window frames without nailing flanges: Seal frames to the wall surface with transition membrane.

K. Aluminum storefront frames: Seal frames to the wall surface with transition membrane.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Standing seam metal roofing.
   2. Underlayment.

B. Related Sections:
   1. Section 07 22 00 - Roof Insulation
   2. Section 07 52 20 - Roofing Installer’s Warranty
   3. Section 07 62 00 - Flashing and Sheet Metal

1.3 DEFINITIONS

A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories.

B. Coordinate with Work of all other trades. Although such Work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

1.4 REFERENCES

A. General: Any material or operation specified by reference to the published specification or standard of a manufacturer, trade association, technical organization or other published standard, shall comply with the requirements of the current specification or standard listed or enforced by the Authority Having Jurisdiction (AHJ).

B. American Society for Testing and Materials (ASTM)
   1. ASTM A792 - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   5. ASTM E2140 - Standard Test Method for water penetration of metal roof panel systems by static water pressure head.

C. American Society of Civil Engineers (ASCE)

D. Factory Mutual (FM)
19-210

1. FM 1-28 – “Wind Design”.
2. FM 1-31 – “Panel Roof Systems”.
3. FM 4471 Appendix G- “Susceptibility to Leakage Test Procedure for Class 1 Panel Roofs”.

E. International Code Council (ICC)
1. International Building Code (IBC) – as enforced by AHJ. Without a local AHJ, the 2015 IBC shall be incorporated.
2. International Existing Building Code (IEBC) – as enforced by AHJ. Without a local AHJ, the 2015 IEBC shall be incorporated.

F. Sheet Metal and Air Conditioning Contractors’ National Association (SMACNA)

G. Underwriter’s Laboratories (UL)
2. UL 1897 – “Standard for Uplift Tests for Roof Covering Systems”.

1.5 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each proposed item in product data by circling or highlighting, and affixing the corresponding Article and Paragraph numbers from this Specification. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.

D. Shop Drawings:
1. Submit complete shop drawings and erection details to the Architect for review. Shop drawings shall be prepared by metal roofing manufacturer specifically for this project. Contractor prepared shop drawings are not acceptable.
2. Show method of erection, elevations, and plans of roof, sections and details, flashings, gutters, roof curbs, vents, sealant locations, interfaces with all materials not supplied, and proposed identification of component parts and their finishes.
3. Include full-sized cross-section details of the standing seams.
   a. One in the field of the roof
   b. One at a typical roof rake condition.
4. Do not proceed with manufacture prior to Architect’s review and approval of shop drawings.

E. Engineering Calculations: Submit wind uplift pressure calculations according to ASCE 7 Wind Speed for project location with respect to appropriate Importance Factor, Exposure category and Safety Factor. Calculations shall be sealed by a professional engineer licensed to practice structural engineering in the state in which project is located.

F. Furnish an affidavit from the manufacturer of the underlayment certifying that materials or products delivered to job meet requirements specified and that no material contains asbestos.

G. Mock-Ups for Standing Seam Roofing Panels: Submit a minimum 24-inch square mock-up panel on plywood.
1. Include two (2) panel seams, illustrating both eave and rake conditions.
2. Cut back a corner of the panel to show the underlayment, and a seam clip.
3. Affix a metal handle to the framing to facilitate handling the mock-up.

1.6 QUALITY ASSURANCE
A. Installation of metal roofing and all accessories shall be by installers with a minimum of three (3) years experience in Work of this nature. Installer must be able to show satisfactory evidence of completion of at least three (3) projects of similar size and complexity within an area of no more than 200 miles radius of the project site in the past five (5) years.

B. Manufacturer's Qualifications: Manufacturer with a minimum of ten (10) years’ experience in manufacturing and supplying prefinished metal of this type, in a permanent, stationary, indoor production facility.

C. The forming and installation of all sheet metal shall be as indicated on the Drawings and in accordance with the applicable details of the SMACNA Manual.

D. In case of conflict between the referenced specifications or standard and the project specification, the Contractor shall be deemed to have assumed the more expensive method of accomplishing the Work, unless prior to signing of the Agreement, the Contractor shall have asked for and obtained a decision as to which method or material is intended.

E. Pre-Roofing Conference: Prior to installation of roofing and associated Work, meet at project site, or other mutually agreed location, with installer, installers of related Work, and other entities concerned with roofing performance, including the Architect and Owner. Record discussions and agreements and furnish a copy to each participant. Provide at least seventy-two (72) hours advance written notice to all participants prior to convening pre-roofing conference.

1.7 SYSTEM PERFORMANCE

A. System shall accommodate movement of underlying structure and of roofing components, without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal temperature ranges.

B. Sheet metal roofing system including, but not limited to, metal roof panels, cleats, clips, anchors and fasteners, sheet metal flashing integral with sheet metal roofing, fascia, trim and accessories, shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

C. System shall be designed and fabricated to be - and shall remain - watertight.

1.8 PROJECT CONDITIONS

A. No asbestos containing material (ACM) shall be brought onto the project site, and/or incorporated into the project without the written consent of the Owner. Any asbestos containing material found at any time, including after Contract completion, to have been brought into the project by the Contractor or any of his subcontractors, sub-subcontractors or suppliers, shall be removed and disposed of in accordance with the then-current governmental regulatory standards.

B. Protect products and accessories against damage and discoloration. Inside dry storage is required to prevent condensation from forming between sheets and components.

C. Avoid overloading roof with stored materials. Do not place concentrated loads on panels, or on structure in excess of twenty (20) lbs. per square foot.

D. Do not permit material storage or excessive foot traffic on completed roof surface.

1.9 WARRANTY

A. The installer shall warrant all materials and installation of standing seam metal roof systems for two (2) years against leaks and defects in materials and workmanship. Submit on form found in Section 07 52
B. Pre-finished metal roofing manufacturer’s standard 20-year finish warranties.

C. Warranties shall commence on the Date of Substantial Completion for the overall project.

PART 2 - PRODUCTS

2.1 ROOF PANEL SYSTEM

A. Acceptable Products:
   1. McElroy Metal; “Maxima ADV.”
   2. MBCI; “Super Lok Interlock.”

B. Type: Shop formed and field fabricated, "double-lock" structural standing seam.

C. Style: Concealed fastener; continuous, factory-installed sealant bead at seams.

D. Texture: Smooth (Non-Striated).

E. Panel Length: Continuous from eave to ridge.

F. Construction: 24-gauge pre-finished Galvalume® sheet steel (22-gauge if needed as available by manufacturer), treated, primed and finished under precision conditions, with seams spaced 16 to 18 inches wide. The Contractor may choose a panel width (between these two limits) depending upon available equipment. Finish seam height: 1-3/4 inch to 2 inches in height.

G. Panel Finishes:
   1. Panels over insulation, plywood or glass-faced gypsum roof board.
      a. Exposed Finish (Top side): Kynar 500® fluorocarbon coating.
      b. Unexposed Finish (Bottom Side): Manufacturer’s standard primer coat.

H. Color: Exposed, top side of panels shall match pre-finished metal color selected under Section 07 62 00.

I. Protection: Deliver metal to the site with a factory-applied protective plastic film that shall be removed from the entirety of the panel, just prior to placement.

J. Clips: Galvalume.

K. Seam Sealant: Sonneborn NP-1, or an approved equal. One-component urethane gun-grade sealant, meeting ASTM C 920, Type S, Grade NS.

L. Closure & Trim: Minimum 24-gage pre-finished metal in the profiles where shown on the Drawings, or as required to provide a complete assembly.

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
   2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
   3. Products: Subject to compliance with requirements, provide one of the following:
      a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.

B. Underlayment Schedule:
1. Insulated roofs: 1 ply of self-adhering, high-temperature sheet.

2.3 FASTENERS

A. Panel Clip Fasteners: Stainless steel pancake-head Phillips screws; #12 x length required.

B. Miscellaneous Fasteners: See Section 07 62 00.

C. Compatibility: All fasteners shall be compatible with materials to be joined.

2.4 FLASHINGS AND TRIM

A. Flashings shall not compromise the integrity of the roof system by constricting movement due to thermal expansion and contraction.

B. All trim and flashing shall be manufactured from minimum 24-gauge pre-finished sheet metal. See Section 07 62 00.

C. Concealed continuous cleats and other metal shown in the Drawings not to be pre-finished: minimum 22-gauge galvanized steel, unless otherwise noted.

D. Z-clips at ridge and other flashing conditions: Manufactured from matching prefinished metal. Cut Z-clips neatly to conform to panels. Set Z-clips in full bed of sealant turning up at each end. Remove all exposed sealant. Attach clips with minimum of three (3) specified screws per clip.

2.5 TRIM PRODUCTION

A. Corners: Same materials, thickness, and finish as roof panels as detailed on the drawings, brake formed, shop cut and factory mitered to required angles.

B. Rake, closure pieces, caps, ridges, valleys and other miscellaneous trim: Same material, thickness, and where exposed, of same finish as sheet stock; brake formed to required profiles.

C. On-site fabrication of component profiles must be with approved equipment intended for that purpose. Hand- or tong-braking of sheet metal components will not be permitted unless approved in advance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect and ensure surfaces are free from objectionable warp, wave, and buckle before proceeding with installation of pre-formed metal roofing.

B. Ensure substrate is ready to receive metal roofing. Report items for correction and do not proceed with metal roof panel system installation until resolved.

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering, High-Temperature Sheet Underlayment: Install one (1) ply of specified material over clean CDX plywood, lapping sides of sheets a minimum of 2 inches and end laps a minimum of 6-inches. Lay sheets shingle style perpendicular to the roof slope. Terminate sheet at eaves and vertical penetrations. Do not seal with flashing cement at penetrations.
3.3 **ROOF PANEL INSTALLATION**

A. Do not proceed with panel installation until underlayment is complete and has been observed by the Architect and Owner.

B. Install all accessory Work such as trim, gutters, cleats, etc., prior to installation of panels, as required.

C. Install roof panels weather tight, without waves, warps, buckles, fastening stresses or distortion, and allowing for expansion and contraction. Oil-canning in excess of the Architect’s expected allowance may be cause for rejection.

D. Install panels in accordance with the Drawings, the current edition of the specified standards and approved shop drawings.

E. Install panels, plumb, level, and straight with seams and ribs parallel, conforming to design as indicated.

F. Fabricate and install Work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves and avoidable tool marks, considering the temper and reflectively of the metal. Provide uniform, neat seams. Except as otherwise shown, fold back the sheet metal to form a hem on the concealed side of exposed edges where required.

G. Concealed Clips at Panel Seams. Install clips with minimal contact with panel edge to prevent warping or binding and restriction of panel expansion. Attach clips with two (2) #12 stainless steel pan-head Phillips screws each.
   1. **Clips at Plywood Decks:** Space at 12-inches on centers, maximum.
   2. **Clips at Open Framing:** Space 60-inches on centers, maximum. Center clips on structural framing members to minimize visibility from below.

H. All field seams shall be of uniform height, mechanically or hand seamed.

I. When fitting panels and seams provide maximum care to prevent deformation of the metal.

J. Seams on metal roof panels installed over open framing shall be symmetrical on both sides of the ridge.

3.4 **CLEANING AND PROTECTION**

A. Dispose of excess materials and remove all debris from site.

B. Clean Work in accordance with standard NRCA industry recommendations.

C. Protect Work against damage until final acceptance. Replace or repair to the satisfaction of the Architect and Owner any Work that becomes damaged prior to final acceptance.

D. Do not use touch-up paint to repair scratched metal surfaces. Scratches unacceptable to the Architect shall result in replacement of the damaged metal. This determination shall be the Architect’s alone.

**END OF SECTION**
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Metal soffit panels.
   B. Related Sections
      1. Section 07 52 20 - Roofing Installer’s Warranty
      2. Section 07 62 00 - Flashing and Sheet Metal

1.3 DEFINITIONS
   A. Metal Soffit Panel Assembly: Metal soffit panels, attachment system components, miscellaneous metal framing and accessories.
   B. Coordinate with Work of all other trades. Although such Work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

1.4 SUBMITTALS
   A. Comply with provisions of Division 01.
   B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph numbers from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.
   C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of soffit panel and accessory.
   D. Shop Drawings:
      1. Submit complete shop drawings and erection details to the Architect for review. Shop drawings shall be prepared by metal panel manufacturer specifically for this project. Contractor prepared shop drawings are not acceptable.
      2. Show method of installation, sections and details, interfaces with all materials not supplied, and proposed identification of component parts and their finishes.
      3. Do not proceed with manufacture prior to Architect’s review and approval of shop drawings.
   E. Submit complete manufacturer’s literature for all materials required for completion of the project indicating compliance with all standards of these Specifications.
   F. Samples for Metal Soffit Panels: Submit two (2) 12-inch long samples by full width of specified panel.
1.5 QUALITY ASSURANCE

A. Installation of metal panels and all accessories shall be by installers with a minimum of three (3) years’ experience in Work of this nature. Installer must be able to show satisfactory evidence of completion of at least three (3) projects of similar size and complexity within an area of no more than 200-mile radius of the project site in the past five (5) years.

B. Any material or operation specified by reference to the published specification or standard of a manufacturer, trade association, technical organization or other published standard, shall comply with the requirements of the current specification or standard listed:
   3. ASTM A792-83-A355: Specification for Steel Sheet, aluminum-zinc alloy coated (galvanized) by the hot dip process, general requirements (Galvalume®).
   6. ANSI/ASTM A446: Steel Sheet, Zinc-Coated (galvanized) by the hot-dip Process, Structural (physical) Quality.

C. The forming and installation of all sheet metal shall be as indicated on the Drawings and in accordance with the applicable details of the SMACNA Manual.

D. In case of conflict between the referenced specifications or standard and the project specification, the Contractor shall be deemed to have assumed the more expensive method of accomplishing the Work, unless prior to signing of the Agreement, the Contractor shall have asked for and obtained a decision as to which method or material is intended.

1.6 SYSTEM PERFORMANCE

A. System shall accommodate movement of underlying structure and of metal soffit components, without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects, when subject to seasonal temperature ranges.

B. Sheet metal soffit system including, but not limited to, metal soffit panels, anchors and fasteners, sheet metal flashing integral with sheet metal soffit, trim and accessories, shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1.7 PROJECT CONDITIONS

A. Protect products and accessories against damage and discoloration. Inside dry storage is required to prevent condensation from forming between sheets and components.

1.8 WARRANTY

A. The installer shall warrant all materials and installation of soffit systems for two (2) years against leaks and defects in materials and workmanship. Submit on form found in Section 07 52 20.

B. Pre-finished metal panel manufacturer’s standard 20-year finish warranties

C. Warranties shall commence on the Date of Substantial Completion for the overall project.

PART 2 - PRODUCTS
2.1 SOFFIT PANELS

A. Acceptable Products:
   1. McElroy Metal: “Marquee-Lok.”
   2. MBCI: “Artisan Series.”
   4. Soffit panels shall be manufactured by the same manufacturer as approved for the metal roof panels.

B. Type: Shop-formed, 12-inch wide soffit panels of pre-finished metal sheet.

C. Style: Concealed fasteners, supplemented where required by blind rivets.

D. Configuration: Flat; provide 25% of panels as vented.

E. Panel Length: Continuous, uninterrupted length.

F. Construction: 24-gauge pre-finished Galvalume® sheet steel, treated, primed and finished under precision conditions.

G. Panel Finish:
   1. Exposed Finish: Kynar 500®.
   2. Unexposed Finish: Manufacturer’s standard primer coat.
   3. Color: As selected by Owner.

H. Protection: Deliver metal to the site with a factory-applied protective plastic film which shall be removed immediately upon installation.

I. Closure & Trim: Minimum 24-gage pre-finished metal in the profiles where shown on the Drawings, or as required to provide a complete assembly.

2.2 FASTENERS

A. Panel Fasteners: Stainless steel pancake-head Phillips screws; #12 x length required.

B. Miscellaneous Fasteners: See Section 07 62 00.

C. Compatibility: All fasteners shall be compatible with materials to be joined.

2.3 FLASHINGS AND TRIM

A. Flashings shall not compromise the integrity of the soffit system by constricting movement due to thermal expansion and contraction.

B. All trim and flashing shall be manufactured from minimum 24-gauge pre-finished sheet metal. See Section 07 62 00.

2.4 TRIM PRODUCTION

A. Corners: Same materials, thickness, and finish as soffit panels as detailed on the drawings, brake formed, shop cut and factory mitered to required angles.

B. Miscellaneous trim: Same material, thickness, and where exposed, of same finish as sheet stock; brake formed to required profiles.

C. On-site fabrication of component profiles must be with approved equipment intended for that purpose. Hand- or tong-braking of sheet metal components will not be permitted unless approved.
in advance.

PART 3 - EXECUTION

3.1 SOFFIT PANEL INSTALLATION

A. Install all accessory Work such as trim, cleats, etc., prior to installation of panels, as required.

B. Install panels in accordance with the Drawings, the current edition of the specified standards and approved shop drawings.

C. Install panels, plumb, level, and straight with seams and ribs parallel, conforming to design as indicated.

D. Fabricate and install Work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves and avoidable tool marks, considering the temper and reflectively of the metal. Provide uniform, neat seams. Except as otherwise shown, fold back the sheet metal to form a hem on the concealed side of exposed edges where required.

E. When fitting panels and seams provide maximum care to prevent deformation of the metal.

F. Install metal soffit panels mounted to furring channels and/or light gauge framing members. Furring and panels shall be installed in accordance with manufacturer’s written instructions.

G. Install panels continuous from major termination to major or natural termination. Transverse - or lap seams - are not permitted.

H. Factory-cut panels to length. Field cutting of panel ends is discouraged. When field cutting is required, do so with snips or shears, and not with high speed saws.

I. Install sheet metal trim at all terminations and as shown on the drawings. Provide neat rectangular or square escutcheons around all penetrations.

3.2 CLEANING AND PROTECTION

A. Dispose of excess materials and remove all debris from site.

B. Clean Work in accordance with standard NRCA industry recommendations.

C. Protect Work against damage until final acceptance. Replace or repair to the satisfaction of the Architect and Owner any Work that becomes damaged prior to final acceptance.

D. Do not use touch-up paint to repair scratched metal surfaces. Scratches unacceptable to the Architect shall result in replacement of the damaged metal. This determination shall be the Architect’s alone.

END OF SECTION
SECTION 07 41 30
METAL LINER PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Metal liner panels below metal decks at canopies.
   2. Metal liner panels as soffits.

B. Related Sections
   1. Division 05 Section - Provision of structural metal deck for installation by roofing subcontractor at low-slope canopies.
   2. Section 07 52 20 - Roofing Installer's Warranty
   3. Section 07 62 00 - Flashing and Sheet Metal

1.3 DEFINITIONS

A. Metal Liner Panel Assembly: Metal liner panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories.

B. Coordinate with Work of all other trades. Although such Work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

1.4 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph numbers from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.

D. Shop Drawings:
   1. Submit complete shop drawings and erection details to the Architect for review. Shop drawings shall be prepared by metal panel manufacturer specifically for this project. Contractor prepared shop drawings are not acceptable.
   2. Show method of installation, sections and details, interfaces with all materials not supplied, and proposed identification of component parts and their finishes.
   3. Do not proceed with manufacture prior to Architect's review and approval of shop drawings.

E. Submit complete manufacturer's literature for all materials required for completion of the project indicating compliance with all standards of these Specifications.
F. Samples for Metal Liner Panels: Submit two (2) 12-inch long samples by full width of specified panel.

1.5 QUALITY ASSURANCE

A. Installation of metal panels and all accessories shall be by installers with a minimum of three (3) years experience in Work of this nature. Installer must be able to show satisfactory evidence of completion of at least three (3) projects of similar size and complexity within an area of no more than 200 miles radius of the project site in the past five (5) years.

B. Any material or operation specified by reference to the published specification or standard of a manufacturer, trade association, technical organization or other published standard, shall comply with the requirements of the current specification or standard listed:
   3. ASTM A792-83-A355: Specification for Steel Sheet, aluminum-zinc alloy coated (galvanized) by the hot dip process, general requirements (Galvalume®).
   6. ANSI/ASTM A446: Steel Sheet, Zinc-Coated (galvanized) by the hot-dip Process, Structural (physical) Quality.

C. The forming and installation of all sheet metal shall be as indicated on the Drawings and in accordance with the applicable details of the SMACNA Manual.

D. In case of conflict between the referenced specifications or standard and the project specification, the Contractor shall be deemed to have assumed the more expensive method of accomplishing the Work, unless prior to signing of the Agreement, the Contractor shall have asked for and obtained a decision as to which method or material is intended.

1.6 SYSTEM PERFORMANCE

A. System shall accommodate movement of underlying structure and of metal liner components, without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects, when subject to seasonal temperature ranges.

B. Sheet metal liner panel system including, but not limited to, metal liner panels, cleats, clips, anchors and fasteners, sheet metal flashing integral with panels, fascia, trim and accessories, shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1.7 PROJECT CONDITIONS

A. Protect products and accessories against damage and discoloration. Inside dry storage is required to prevent condensation from forming between sheets and components.

1.8 WARRANTY

A. The installer shall warrant all materials and installation of metal liner systems for two (2) years against leaks and defects in materials and workmanship. Submit on form found in Section 07 52 20.

B. Pre-finished metal liner panel manufacturer’s standard 20-year finish warranties

C. Warranties shall commence on the Date of Substantial Completion for the overall project.
PART 2 - PRODUCTS

2.1 LINER PANELS

A. Acceptable Products:
   1. McElroy Metal: “Marquee-Lok.”
   2. PAC-CLAD, “Flush Soffit.”
   3. Prior approved equal.

B. Type: Shop-formed, 18-inch wide (or as needed to match deck flute spacing) flush liner panels of pre-finished metal sheet.

C. Style: Concealed fasteners, supplemented where required by blind rivets.

D. Texture: “Vee” grooves, at 4 inches on centers.

E. Panel Length: Continuous, uninterrupted length.

F. Construction: 24-gauge pre-finished Galvalume® sheet steel, treated, primed and finished under precision conditions.

G. Panel Finish:
   1. Exposed Finish (Bottom side): Kynar 500® fluorocarbon coating.
   2. Unexposed Finish (Top side): Manufacturer’s standard primer coat.

H. Protection: Deliver metal to the site with a factory-applied protective plastic film which shall be removed immediately upon installation.

I. Closure & Trim: Minimum 24-gage pre-finished metal in the profiles where shown on the Drawings, or as required to provide a complete assembly.

2.2 FASTENERS

A. Miscellaneous Fasteners: See Section 07 6200.

B. Compatibility: All fasteners shall be compatible with materials to be joined.

2.3 FLASHINGS AND TRIM

A. Flashings shall not compromise the integrity of the liner system by constricting movement due to thermal expansion and contraction.

B. All trim and flashing shall be manufactured from minimum 24-gauge pre-finished sheet metal. See Section 07 62 00.

2.4 TRIM PRODUCTION

A. Corners: Same materials, thickness, and finish as liner panels as detailed on the drawings, brake formed, shop cut and factory mitered to required angles.

B. Miscellaneous trim: Same material, thickness, and where exposed, of same finish as sheet stock; brake formed to required profiles.

C. On-site fabrication of component profiles must be with approved equipment intended for that purpose. Hand- or tong-braking of sheet metal components will not be permitted unless approved in advance.
PART 3 - EXECUTION

3.1 LINER PANEL INSTALLATION

   A. **NOTE**: Metal roofing subcontractor shall install the structural steel deck only at canopies that receive metal liner panels, as well as the metal liner panels themselves. Coordinate with Division 05 Section for provision of structural steel decking.

   B. Lay full length and width liner panels into place over exposed structural steel, spanning between beams. Slide panels into liner panel side-laps and fasten with #9 x 5/8-inch stitch screws at 24 inches on centers through the side-laps. Use full-length sheets, without end laps.

   C. Follow the liner panels with structural metal deck, mechanically fastened. Fasten the entire assembly concurrently. Install blind rivets where necessary to limit sag in the liner panels. Install these fasteners in straight lines, parallel to the structural supports.

3.2 CLEANING AND PROTECTION

   A. Dispose of excess materials and remove all debris from site.

   B. Clean Work in accordance with standard NRCA industry recommendations.

   C. Protect Work against damage until final acceptance. Replace or repair to the satisfaction of the Architect and Owner any Work that becomes damaged prior to final acceptance.

   D. Do not use touch-up paint to repair scratched metal surfaces. Scratches unacceptable to the Architect shall result in replacement of the damaged metal. This determination shall be the Architect’s alone.

END OF SECTION
SECTION 07 52 16
MODIFIED BITUMEN ROOF SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Qualifications, Standards and Materials for new roof assembly.
2. Modified bituminous membrane roofing.
3. Roof walkway pads.

B. Related Sections
1. Section 06 10 50 - Roof Carpentry
2. Section 07 22 00 - Roof Insulation
3. Section 07 52 20 - Roofing Installer’s Warranty
4. Section 07 62 00 - Flashing and Sheet Metal
5. Section 07 72 00 - Roof Accessories

1.3 DEFINITIONS

A. Roofing Terminology: See 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.

1.4 REFERENCES

A. General: Any material or operation specified by reference to the published specification or standard of a manufacturer, trade association, technical organization or other published standard, shall comply with the requirements of the current specification or standard listed or enforced by the Authority Having Jurisdiction (AHJ).

B. American Society of Civil Engineers (ASCE)

C. American Society for Testing and Materials (ASTM)
1. ASTM D 41 - “Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing”.

Administrative Upgrades at
Adams Hill Elementary School
Northside ISD
D. Factory Mutual (FM)
   1. FM 1-SH – “Roof Assembly Classification for Severe Hail Exposure”.
   2. FM 4450 – “Approval Standard for Class 1 Insulated Steel Roof Decks”.

E. National Roofing Contractors Association (NRCA)
   1. “Handbook of Accepted Roofing Knowledge”.
   2. “Roofing and Waterproofing Manual”.

F. Underwriter’s Laboratories (UL)

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Provide installed membrane roofing and base flashings that withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

1.6 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product Data: For each type of product indicated, including all items specified in Part 2 – Products or otherwise required by the Work.

D. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.

   1. Base flashings and membrane terminations.
   2. Tapered insulation, including slopes.
   3. Crickets, saddles, and tapered edge strips, including slopes.
   4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

E. Manufacturer’s Certification: Provide current letter(s) on membrane manufacturer’s letterhead, signed by an authorized employee or corporate officer attesting to following:

   1. Products: Certify that roofing system complies with requirements specified in “Performance Requirements” Article.
   2. Submit evidence of meeting performance requirements, including that:
      a. Roofing system components are physically and chemically compatible for installation as designed, and;
      b. All proposed materials, including those by other manufacturer, are acceptable to membrane manufacturer for use in system, and;
      c. Proposed system meets all criteria for issuance of required manufacturer’s warranty.
      d. Specifically identify and define any deviations.

F. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
G. Manufacturer's Field Reports: Summarize findings of each inspection. Indicate any discrepancies from recommended installation methods, corrective action recommended to installer, and any non-compliant or unsatisfactory conditions.

H. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

I. Submit shop drawing indicating proposed walkway pad installation for renovated and new roofing systems.

J. Project Record Documents: Accurately record exact location of all roof membrane penetrations and all authorized changes to Contract Documents.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: As listed in Article 2.1.

B. Installer Qualifications: A qualified firm that has been continuously approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and specified roof system for minimum of three years prior to Bid Date, and that is eligible to receive manufacturer's NDL warranty; with minimum three years documented experience, including:
   1. Certified by roofing materials manufacturer as an approved NDL applicator for minimum of three years prior to Bid Date, and qualified to provide specified warranty on selected systems and flashings.
   2. Successful completion of minimum five (5) projects of comparable size and specified systems during that time.
   3. All torching operations must be performed by CERTA (Certified Roofing Torch Applicator) trained applicators with up to date certifications.

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. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repair, NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.

F. Assign a qualified, full time, non-working supervisor to be on Project site at all times during installation of Work.

G. Designate a responsible Project Manager or Superintendent to inspect all installed Work, particularly tie-ins and temporary flashings, at end of each working day and as otherwise required to ensure water-tightness.
   1. Verify Inspection by signature on approved Daily Inspection Form signifying installation is in accordance with specified requirements.

H. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

I. Pre-Roofing Conference: Before starting roofing operations, conduct conference.
   1. Meet with Owner, Architect, roofing Installer, roofing system manufacturer's representative, 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. Review structural loading limitations of roof deck during and after roofing.
5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
6. Review governing regulations and requirements for insurance and certificates if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.

J. Do not allow materials which have not been approved through the submittal process to be brought onto the project site.
   1. Materials brought onto the site which have not been approved through the submittal process will be rejected and shall be removed immediately.
   2. Remove any materials incorporated into the Work, which have not been approved through the submittal process.

K. The manufacturer's representative shall make a minimum of two (2) site visits to the project per month at critical stages of the roof installation, and forward to the Architect written reports of the observations and instructions given to the Contractor during these visits. Coordinate the visits to take place at the time of the Architect's visits, with one occurring at the monthly pay application meeting. Include at the minimum the following information in manufacturer's representative's reports:
   1. Prepare reports typewritten on the manufacturer's letterhead stationery, and submit to the Architect within seven (7) days of the site visit.
   2. Document Work in progress and list all deficiencies, corrective actions and recommendations.
   3. Failure of the manufacturer's representative to provide the required reports is cause for rejection of the Contractor's pay application.

1.8 REGULATORY REQUIREMENTS
A. Conform to applicable local codes for roof assembly fire hazard requirements and application procedures.
B. Provide certification of inspection confirming approval of design and installation by authority having jurisdiction.
C. 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.
   2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Deliver roofing materials to Project site in original sealed and labeled shrouds on pallets and labeled with manufacturer's name, product brand name and type.
   1. Inspect for damage.
   2. Store products in weather protected environment, clear of ground and moisture.
   3. Stand and store roll materials on end.
   4. Deliver materials in quantities to allow continuity of application throughout the Project.
   5. Coordinate shipment receipt as necessary to cause Owner least amount of interference in Owner's operations. Owner will not take responsibility for product deliveries.

B. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
1. Do not store more materials on roof overnight.
2. Maximum Allowable Loading on Roof: 20 pounds per square foot.
3. Promptly mark, remove from the site and properly dispose of contaminated materials.

1.10 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. Do not apply roofing membrane during inclement weather.
   2. Do not apply roofing membrane to damp or frozen deck surface.
   3. Observe wind chill and other cold weather conditions for proper bituminous application.
   4. The Contractor shall have the final decision as to whether to chance roofing operations in the event wet conditions threaten and shall consider wind speed as a determining factor as to whether roofing operations can be safely accomplished under such conditions.
   5. The Contractor shall suspend Work if, in his/her opinion, wind speed will impede the proper installation of the roofing Work, or cause a danger to its personnel, or the Owner's property.

1.11 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Division 01 Section "Administration Requirements."

B. Coordinate with demolition work and with work of other trades to ensure sufficient materials and manpower are available to complete and make watertight all roofing Work each day.

C. Coordinate installation of associated metal flashings, and roof-related items as work of this Section proceeds. Strip-in all flanged metal components to roof membrane on same day they are installed.

D. Schedule work to avoid storage on and traffic over finished work.

E. Upon completion of Work each day that torching operations occur, provide a full 1-hour fire watch by a competent person, trained to detect possible smoke or fire resulting from roofing operations. Should the competent person detect smoke or fire he shall immediately place a telephone call to the Fire Department through the 911 exchange.

F. Mount and maintain a minimum of two (2) fully charged and workable 3A60BC class fire extinguishers at the roof level at all times Work is underway. Position fire extinguishers within 25 feet of torching operations. Train all workers in proper fire extinguisher use.

1.12 WARRANTY

A. Provide a two-year written warranty covering defects in the roofing materials and labor, on the form in Section 07 52 20.

B. Provide the roofing materials manufacturer's 20-year no-dollar-limit type warranty covering repair of defects in the insulation, roofing and composition flashings, and repair of interply blistering.

C. Commence all warranties on the Date of Substantial Completion for the overall project.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMEN MANUFACTURERS

A. Siplast
B. U.S. Ply
C. Johns Manville
D. Soprema
2.2 SHEET MATERIALS

A. Modified Bitumen Base Ply: Fiberglass or polyester mat, coated with SBS or APP modified asphalt.
   1. Siplast Paradiene 20 TG
   2. U.S. Ply DuraFlex 90 TG SBS Base
   3. Johns Manville DynaWeld Base
   4. Soprema Elastophene Flam

B. Modified Bitumen Cap Ply: Fiberglass or polyester reinforced SBS or APP modified bitumen, with white granular surfacing.
   1. Siplast Paradiene 30 FR TG BW
   2. U.S. Ply DuraFlex G4FRTG SBS Ultra White
   3. Johns Manville Dynaweld Cap FR CR G
   4. Soprema Sopralene Flam 250 FR GR

2.3 FLEXIBLE FLASHINGS

A. Backer Ply: Fiberglass or polyester mat, coated with SBS or APP modified bitumen, having a smooth surface.
   1. Siplast Paradiene 20 TG
   2. U.S. Ply DuraFlex 90 TG SBS Base
   3. Johns Manville DynaWeld Base
   4. Soprema Elastophene Flam

B. Base Flashing Finish Ply: Fiberglass or polyester mat coated with modified bitumen and metal foil surface. The flashing system is to be approved by the membrane manufacturer for use with its respective system.
   1. Siplast Veral Aluminum
   2. U.S. Ply DuraFlex Alum SBS
   3. Johns Manville DynaClad
   4. Soprema Sopralast 50 TV Alu

2.4 AUXILIARY ROOFING MEMBRANE MATERIALS

A. Asphalt Primer: ASTM D41.

B. Plastic Cement: ASTM D4586, Type I, asbestos free.

C. Flashing Cement: Compatible with modified bitumen membrane.

D. Mechanical Fasteners for Flexible Flashing:
   1. Masonry: 0.25-inch x 1.5-inch zinc-jacketed steel masonry drive pin; Zamac “Hammer Screw,” or an approved equal.
   2. Wood Blocking: Stainless steel (for fastening into ACQ treated lumber) or high carbon, zinc coated steel (for fastening into non-ACQ treated lumber); annular threaded 1-inch shank nails; with minimum 1-inch x 30 gage metal disk; Roofing Nail, manufactured by Simplex Nails, Inc.

E. Roofing Nails:
   1. Stainless steel for fastening into ACQ treated lumber.
   2. Provide with annular rings, size as required to suit application; minimum 11-gauge with 3/8-inch diameter head.

F. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing membrane.
G. Termination Bars: 12-ga. or 1/8-inch x 1-inch stainless-steel bar stock.

H. Roof Walkway Pads: Standard roof walkway pads, consisting of modified bitumen asphaltic multiply panels and including an integral white/gray granule top surface. Roll walkway pads or pads cut from rolls are not acceptable unless listed below.
   1. Acceptable Products:
      a. Whitewalk (3’ x 4’ x ½”) as manufactured by W.R. Meadows.
      b. APOC 5040 DEK-TOP (3’ x 4’ x ½”) as manufactured by APOC.
      c. Watco Roof Walkway Matting (3’ x 33’ x 9/16”) as manufactured by Watco Industrial Flooring, Inc.
      d. DynaTred Plus (2’6” x 2’6” x 1/3”) as manufactured by Johns Manville.
   2. Pads shall be compatible with and acceptable to the roofing system manufacturer.

I. Expansion Joint Filler:
   1. Flexible Vapor Retarder: Minimum 45 mil thick vinyl sheet, or approved equal.
   2. Compressible Insulation: Fiberglass batt insulation, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify the insulation is clean and smooth, free of depressions, waves, or projections, properly sloped to drains or eaves.

C. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly anchored and wood nailers are in place.

D. Start of installation shall constitute Contractor’s acceptance of existing conditions.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing membrane 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 temporary closures or roof-drain plugs prior to leaving the job site each day.

3.3 ROOFING MEMBRANE INSTALLATION - GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions, these documents and as follows:
   1. Deck Type: Insulated.
   3. Number of Modified Asphalt Sheets: Two.
   4. Surfacing Type: Granule.

B. Cooperate with testing agencies engaged or required to perform services for installing roofing system.

C. Coordinate installing roofing system so 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 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.

3.4 APPLICATION OF ROOFING SYSTEM

A. Torch-in-place base ply over specified roof board and insulation per manufacturer's written instructions. Fully-adhere the base ply to the substrate by continuous torching of the plies. Lightly trowel the edges of each sheet.

B. Torch-seal one additional ply of base sheet around roof penetrations prior to installation of cap sheet.

C. Apply cap ply parallel to base ply in accordance with manufacturer's instructions. Fully-torch cap ply to the previously-installed base ply.
   1. Provide 4-inch side and end laps. Stagger lap joints between base ply and cap ply.
   2. Stagger lap joints between adjacent plies of cap ply sheet by a minimum of 12 inches.
   3. Where cap ply is applied over granule surface of previously installed ply, apply asphalt primer to surface of granular ply and allow it to dry prior to torching next ply.
   4. Limit modified bitumen bleed at ply laps to no more than 0.5 inch. Lightly trowel edges of ply while bitumen remains hot.
   5. Cover exposed bitumen per manufacturer's recommendations.

3.5 APPLICATION OF FLASHING

A. Apply flexible base flashings over specified backer felt to seal membrane to vertical elements.
   1. Torch-apply specified backer ply, followed by torch-applied base flashing.
   2. Apply both in strict accordance with manufacturer's written instructions and these Specifications.
   3. Secure top of flashing assembly to wood substrate with specified cap nails, at 8 in. on centers.
   4. Secure top of flashing assembly to masonry substrates with specified termination bar and masonry drive pins spaced at 8 inches on centers.
   5. Cover bitumen bleed at per manufacturers recommendations, to avoid leaving black lines.
   6. Cut the toe of the base flashing straight on the scoring of the sheet, and ensure adjacent sheets have an even edge. Lightly trowel edge of each sheet while bitumen remains hot. Lap bleed shall not exceed 0.25 inch.

A. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions. Install strip-in ply on the same day as the sheet metal penetration flashing or roof perimeter metal edge is installed.

B. Coordinate installation of roof drains, sumps, and related flashings.

3.6 WALKWAY PAD INSTALLATION

A. General Requirements:
   1. Install walkway pads according to walkway manufacturer's written instructions.
   2. Set walkway pads in cold-applied adhesive or by torch application.
   3. Locations: Install pads to and from all roof hatches, ladders, full length of electrical disconnects and service sides of mechanical equipment.
   4. For modular pads, provide a minimum of two pads adjacent to each mechanical equipment access panel, electrical disconnect racks, roof ladder landings, and on three sides of each roof hatch.
5. For roll pads, match the width of mechanical equipment access panels, electrical disconnect racks, roof ladder landings plus 12-inches each side. Provide continuous around three sides of each roof hatch.
6. Modular pads shall be set with a 3-inch minimum gap for drainage.

3.7 FIELD QUALITY CONTROL

A. Test Cuts: Test specimens may be removed to evaluate problems observed during quality-assurance inspections of roofing membrane. Assist in securing roof cuts and patch roof as required to finished condition at no added cost to the Owner.

B. Promptly correct all identified defects and irregularities. Repair all membrane defects called to the attention of the Project Superintendent prior to the end of each day, unless directed otherwise.

C. Final Roof Inspection: Arrange for roofing system manufacturer’s technical personnel to inspect roofing installation on completion.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

3.8 PROTECTING AND CLEANING

A. Protect all Work under provisions of Division 01. In addition, if any roofing surface or component layer is to be subjected to foot traffic, scaffolding or any other work activities by trades other than the roofing contractor, provide a hardened temporary working surface.
   1. For foot traffic and other work directly above the roofing surface, provide temporary 4 ft. x 8 ft., 1/2-inch plywood sheets or equivalent secured to a layer of 1/2-inch wood fiber insulation board. Temporary walkway pads as specified herein may also be used to protect against foot traffic only.
   2. For scaffolding, provide temporary 4 ft. x 8 ft., 3/4-inch plywood sheets secured to a layer of 1/2-inch wood fiber insulation board laid as a working base with scaffolding legs mounted on wood sleepers of size capable of distributing the full scaffolding dead and live load to not exceed 20 psf on the roof surface. Heavier loading must be coordinated with and approved by the Architect and Structural Engineer of Record.
   3. Work by other trades shall not proceed until a temporary working surface has been installed.

B. Protect completed 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.

C. 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.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

E. Remove bituminous markings from all finished surfaces.

F. In areas where finished surfaces are soiled by bitumen or any other source of soiling caused by Work of this Section, consult manufacturer of surfaces for cleaning advice, and conform to their documented instructions. Replace any materials or finishes which cannot be cleaned to the Owner’s satisfaction.

END OF SECTION
WHEREAS ________________________________________________________________.

of ________________________________________________________________.

Herein called the "Contractor," has performed roofing and associated Work on the following project:

Owner: NORTHSIDE INDEPENDENT SCHOOL DISTRICT
Address: 5900 Evers Road, San Antonio, Texas 78238
Project Name: ADMINISTRATION UPGRADES AT ADAMS HILL ELEMENTARY SCHOOL
RFCSP NO. 2020-004
Acceptance Date: ________________ Warranty Period: Two (2) Years
Date of Expiration: ____________________

AND WHEREAS the Contractor has contracted with Owner to warrant said Work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE the Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period will at its own cost and expense, make or cause to be made such repairs to, or replacement of said Work as is necessary to correct faulty and defective Work, and as is necessary to maintain said Work in watertight condition.

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, windstorms, and other unusual phenomena of the elements; (b) fire; (c) failure of roofing system substrate including cracking, settlement, excessive deflection, deterioration, and decomposition; (d) faulty construction of vents, mechanical equipment, and other penetrations not installed as part of the Work; (e) repeated vapor condensation on bottom of roofing; and (f) activity on roofing by other persons including construction contractors and maintenance personnel, whether authorized or unauthorized by Owner.

2. When Work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired by the Contractor, and until cost and expense thereof has been paid for by the Owner, or by another responsible party so designated.

3. The Contractor is responsible for Work covered by this Warranty, but is not liable for consequential damages to buildings or building contents resulting from leaks or faults or defects of the Work.

4. During Warranty Period, if the Owner allows alterations of Work by anyone other than the Contractor, 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 upon date of said alterations, but only to extent said alterations affect Work covered by this Warranty. If the Owner engages the Contractor to perform said alterations, Warranty shall not become null and void, unless the Contractor, before starting said Work, shall have notified the Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate the Work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use or service more severe
than originally specified, this Warranty shall become null and void upon date of said change, but only to extent said changes affect Work covered by this Warranty.

6. Owner shall promptly notify the Contractor of observed, known, or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Contractor to inspect the Work, and to examine evidence of such leaks, defects or deterioration.

7. This Warranty is recognized to be the only Warranty of the Contractor on said Work, and shall not operate to restrict or cut off the Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve the Contractor of responsibility for performance of original Work.

IN WITNESS THEREOF, this instrument has been duly executed this _____day of ______________, 202____.

Contractor Name and Address

_______________________________________  ______________________________________________
Typed name and Title  Signature

_______________________________________  ______________________________________________
Telephone Number  Fax Number

Notary Seal

03-16-2020
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Qualifications, Standards and Materials for roof repairs.
   2. Modified bitumen roofing repairs.
   3. Roof Insulation.

B. Related Sections:
   1. Section 06 10 50 - Roof Carpentry
   2. Section 07 52 20 - Roofing Installer's Warranty
   3. Section 07 62 00 - Flashing and Sheet Metal

1.3 WORK INCLUDED

A. Modifications to existing roofs with the following warranties:
   1. 20-year manufacturer’s warranty by Derbigum.
   2. 2-year contractor’s warranty by Port Enterprises, Ltd.
   3. All Work shall meet the standards of and match existing roof systems currently on the buildings.
   4. All Work on roofs with existing warranties must be performed by Port Enterprises, Ltd.
   5. Remove and repair existing roofing as required for installation of new curbs, flashings and roof penetrations.

1.4 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph numbers from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product List: Submit list of proposed Products and manufacturers, including all items specified in Part 2 – Products or otherwise required by the Work.

D. Product Data: For each type of product indicated. Include installation sequence, special instructions and Material Safety Data Sheets (MSDS) for all materials.

E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system repairs comply with the following:
1. Roofing system components are physically and chemically compatible for installation as
designed, and;
2. All proposed materials, including those by other manufacturer, are acceptable to membrane
manufacturer for use in system, and;
3. The proposed system meets all criteria for maintaining existing manufacturer's warranty.
4. Specifically identify and define any deviations.

G. Manufacturer's Field Reports: Summarize findings of each inspection. Indicate any discrepancies
from recommended installation methods, corrective action recommended to installer, and any non-
compliant or unsatisfactory conditions.

H. Project Record Documents: Accurately record exact location of all roof membrane penetrations and
all authorized changes to Contract Documents.
1. Draw roof area to scale of 1/4-inch per foot or 1/8-inch per foot. Identify school, address and
location on campus referenced to Architect's original roof areas.
2. Show the entirety of the roof area being repaired or modified along with all current
penetrations and roof features.
3. Include north arrow and name and area of building.
4. Include Contractor's name, address, phone and fax numbers.
5. Accurately show location of Work and neatly explain action taken. Include list of materials
used and brand name and manufacturer of each. This information may be attached to the
roof plan on additional pages and follow the format shown in 3.4 below.

1.5 QUALITY ASSURANCE

A. Manufacturer: Manufacturer currently holding warranty of existing roof system.

B. Applicator: Contractor currently holding warranty of existing roof system.

C. Perform Work in adherence to manufacturer's requirements to prevent voiding existing warranties.

D. Source Limitations: Obtain components for roofing system from or approved by roofing system
manufacturer.

E. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repair, NRCA
Roofing and Waterproofing Manual, and manufacturer's instructions.

F. Assign a qualified, full time, non-working supervisor to be on Project site at all times during
installation of Work.

G. Do not allow materials which have not been approved through the submittal process to be brought
onto the project site. Any materials brought onto the site which have not been approved through the
submittal process will be rejected and shall be removed immediately. Remove - without appeal or
exception - any materials incorporated into the Work that have not been approved through the
specified submittal process.

H. The manufacturer's representative shall make a minimum of two (2) site visits to the project per
month at critical stages of the roof installation, and forward to the Architect written reports of the
observations and instructions given to the Contractor during these visits. Coordinate the visits to
take place at the time of the Architect's visits, with one occurring at the monthly pay application
meeting. Include at the minimum the following information in manufacturer's representative's
reports:
1. Prepare reports typewritten on the manufacturer's letterhead stationery, and submit to the
Architect within seven (7) days of the site visit.
2. Document Work in progress and list all deficiencies, corrective actions and recommendations.
3. Failure of the manufacturer's representative to provide the required reports in a timely manner
is cause for rejection of the Contractor's pay application.
I. All Work shall be performed to comply with manufacturer's requirements and prevent voiding existing Warranties.

1.6 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, approval or listing agency markings, and directions for storing and mixing with other components.
   1. Inspect for damage. Replace damaged or deteriorated materials.
   2. Store products in weather protected environment, clear of ground and moisture.
   3. Stand and store roll materials on ends.

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. Promptly mark, remove from the site and discard any materials contaminated by moisture.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
   1. Do not store materials on roof overnight unless approved by the Architect.
   2. Maximum Allowable Loading on Roof: 20 pounds per square foot.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed per manufacturer's written instructions and warranty requirements.
   1. Do not apply roofing membrane during inclement weather.
   2. Do not apply roofing membrane to damp or frozen deck surface.
   3. Observe wind chill and other cold weather conditions for proper bituminous application.

B. Do not apply any portion of the roofing system or its accessories, or start operations in the event precipitation is threatening, unless proper precautions are taken for same. The Contractor shall have the final decision as to whether to chance roofing operations in the event wet conditions threaten, and shall consider wind speed as a determining factor as to whether roofing operations can be safely accomplished under such conditions. The Contractor shall suspend Work if, in his/her opinion, wind speed will impede the proper installation of the roofing Work, or cause a danger to his/her personnel, or to the Owner's property.

C. Do not remove any part of the roof and leave overnight without the application of a fully watertight temporary or permanent repair.

D. Prevent water migration into building by installation of roofing membrane and flashings. At no time leave the building in an open state that would allow water penetration.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing during inclement weather. Temperatures must be a minimum of 40°F and rising.

B. Do not apply roofing material to damp or frozen deck or substrate.
C. Do not undertake roofing operations when the wind is determined to be detrimental to safe installation practices.

1.9  REGULATORY REQUIREMENTS
A. Fire Hazard Classification: UL Class A.

1.10 SEQUENCING AND SCHEDULING
A. Coordinate Work under provisions of the appropriate Division 01 Section regarding administrative requirements."
B. Coordinate with demolition Work and with Work of other trades to ensure sufficient materials and manpower are available to complete and make watertight all roofing Work each day.
C. Limit tear-off of existing roof system to amount that can be completely covered with new roof system and made watertight by end of day.
D. Coordinate installation of associated metal flashings, and roof-related items as Work of this Section proceeds. Strip-in all flanged metal components to roof membrane on same day they are installed.
E. Schedule Work to avoid storage on and traffic over finished Work.
F. Upon completion of Work each day that torching operations occur, provide a full 1-hour fire watch by a competent person, trained to detect possible smoke or fire resulting from roofing operations. Should the competent person detect smoke or fire he or she shall immediately place a telephone call to the Fire Department through the 911 exchange.
G. Mount and maintain a minimum of two (2) fully charged and workable 3A60BC class fire extinguishers at the roof level at all times Work is underway. Position fire extinguishers no farther than 25 feet from torching operations. Train all workers in proper fire extinguisher use.

1.11 WARRANTY
A. Provide a two-year written warranty covering defects in the roofing materials and labor, on the form in Section 07 5220.
B. Commence all warranties on the Date of Substantial Completion for the overall project.

1.12 PRE-INSTALLATION CONFERENCE
A. Attend a pre-installation conference among the parties directly affecting the Work of this Section a minimum of two weeks prior to the start of Work under this Section.
B. Required Attendees: Contractor's Project Manager and Superintendent; Mechanical, Plumbing and Electrical Trades Representatives; Manufacturer’s Field Technical Representative; Owner's Representative(s); Architect and/or his designated representative(s).
D. Produce accurate and comprehensive written minutes of the meeting, and distribute copies to each party.
PART 2 – PRODUCTS

2.1 MANUFACTURERS

1. Derbigum

2.2 SHEET PRODUCTS

A. Materials: Derbigum
   1. Base Ply: Derbibase Ultra
   2. Cap Ply: Derbiclor P-FR-CR

2.3 FLEXIBLE FLASHINGS

A. Materials: Derbigum
   1. Backer Ply: Derbibase Ultra
   2. Finish Ply: Derbiclor P-FR-CR

2.4 BITUMINOUS MATERIALS

A. Asphalt Primer: ASTM D41.

B. Plastic Cement: ASTM D4586, Type I, asbestos free.

C. Flashing Cement: Manufacturer’s recommended MBR cement.

2.5 ACCESSORIES

A. Roofing Nails: 11-gauge stainless steel wire nails with 3/8-inch diameter heads, length as required for penetration of the substrate a minimum of ¾-inch.

B. Mechanical Fasteners for Flexible Flashing:
   1. Wood Blocking: High carbon, stainless steel, annular threaded, 1-inch shank nails, with minimum 1-inch x 1-inch x 16-gauge plastic disk cap nail, as manufactured by Simplex Nails, Inc., or an approved equal.

C. Termination Bar: 12-gauge or 1/8” x 1-inch stainless-steel bar stock.

D. Structural Sealant: Chem Link “M-1” sealant. No substitutions permitted.

E. Roof Walkway Pads: Replace walkway pads disturbed by the roofing repairs with material of equal composition.

2.6 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer’s standard sizes suitable for application, of thicknesses indicated.

B. Polysocyanurate Insulation Board:
   2. Size and Thicknesses: As required to match existing for repair operation.

C. Roof Cover Board: “DensDeck Prime,” gypsum roof board, as produced by Georgia-Pacific, or “Securock,” as produced by U.S. Gypsum.
   1. Over Field of Roof Insulation: 1/2-inch thickness.
   2. Over Cants and Roof Curbs: 1/4-inch thickness.
4. Miter edges of 1/4-inch roof board strips at tops and bottoms of cants.

2.7 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Insulation Adhesive:
   1. As recommended by roof membrane manufacturer; quick-setting “OlyBond 500” adhesive, or an approved equal.

C. Cant Strips: ASTM C-728, perlite insulation; 1-1/2 inch thick x 4-inch face width minimum.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces and site conditions are ready to receive Work and that deck is supported and secured.

B. Verify that roof openings, curbs, pipes, sleeves, ducts and vents through the roof are solidly set and wood nailing strips are in place.

C. Beginning of installation means Installer accepts existing surfaces. Subsequent replacement of unsatisfactory installation will not be compensated by the Owner.

3.2 PREPARATION

A. Protect all building surfaces against damage from roofing Work.

B. Prevent debris from entering scuppers, downspouts, drains, underside of roof deck or other openings. Remove temporary closures in all drainage devices prior to leaving the job each day.

C. Clean surfaces of roof deck and maintain dust and debris free during roofing operations.

D. Demolished materials shall not be placed on existing or newly finished roofing membrane without required protection.

E. Do not leave open conditions overnight without the required torch-applied modified bitumen base sheet.

3.3 GENERAL ROOFING APPLICATION

A. Application shall be in accordance with the roofing system manufacturer's instructions and the following requirements. Application of roofing shall follow spudding, demolition and insulation installation, as a continuous operation, on the same day wherever possible.

B. Roofing insulation, flashings and any other detailed or specified accessories shall be applied in strict accordance with approved industry methods and materials as well as manufacturer's latest printed specifications.

C. Apply sheets smooth, free of air pockets, wrinkles, fishmouths, or tears. Install sheets to avoid "bucking" or otherwise impeding the flow of water.

D. All plies shall be laid without wrinkles, buckles, or kinks so that the finished roof surface is free of pockets or blisters. Each ply or sheet shall be rolled from the insulation or exposed deck side during
3.4 GENERAL WORK PROCEDURES

A. Base Flashing Installations:
1. Remove existing plies, base flashing, insulation and/or other roofing components to the extent necessary for installation of new structural and mechanical Work.
2. Remove all debris from the roof surface daily. Do not place debris directly on unprotected finished roof surface.
3. Protect open edges of insulation from water entry at all times. Do not leave insulation edges open to the elements overnight.
4. Install new structural repairs, decking, curbs, etc., and secure to structure/deck as required.
5. Install new insulation and cant as required.
6. Install specified base flashing system as applicable.
7. Maximum flashing base and top ply width: Width of roll.
8. Extend base flashing up walls or parapets a minimum of 8-inches above roofing membrane and 4-inches onto field of roofing membrane.
9. Install metal flashings as detailed or required by Section 076 200 and the Drawings.

B. Cricket Installation and Large Roof Repairs:
1. Sweep and/or power-wash membrane as required for removal of all loose granules.
2. Ventilate existing roof membrane over area to receive new tapered crickets by slicing completely through both membrane plies. Venting slices shall extend the full width of the cap ply and be spaced at 36 inches on centers. Stagger slices between adjacent cap plies. Venting: as recommended by existing roof membrane manufacturer.
3. Install new tapered polyisocyanurate insulation and roof cover board in low-rise foam adhesive, as specified and approved by the manufacturer of the warranted roof assembly.
4. Apply asphalt primer extending 8-inches onto existing cap ply past toe of new cricket.
5. Apply modified bitumen base ply by torch application extending base ply 4-inches onto existing membrane past toe of new cricket.
6. Apply granule surfaced modified bitumen cap ply by torch application extending cap ply 4-inches onto existing membrane past edge of base ply to line of primed cap sheet.

3.5 PROTECTION OF FINISHED WORK

A. Protect all Work under provisions of Division 01. In addition, if any roofing surface or component layer is to be subjected to foot traffic, scaffolding or any other work activities by trades other than the roofing contractor, provide a hardened temporary working surface.
1. For foot traffic and other work directly above the roofing surface, provide temporary 4 ft. x 8 ft., 1/2-inch plywood sheets or equivalent secured to a layer of 1/2-inch wood fiber insulation board. Temporary walkway pads as specified herein may also be used to protect against foot traffic only.
2. For scaffolding, provide temporary 4 ft. x 8 ft., 3/4-inch plywood sheets secured to a layer of 1/2-inch wood fiber insulation board laid as a working base with scaffolding legs mounted on wood sleepers of size capable of distributing the full scaffolding dead and live load to not exceed 20 psf on the roof surface. Heavier loading must be coordinated with and approved by the Architect and Structural Engineer of Record.
3. Work by other trades shall not proceed until a temporary working surface has been installed.

B. Where traffic must traverse existing roofs, provide a protective covering consisting of plywood sheets secured to a layer of ½-inch wood fiber insulation board and laid loose over the membrane with the insulation board side to the roof surface.
1. Do not store materials on the roof without this protective covering.
2. Any damage to existing roofs shall be repaired at the Contractor’s cost per requirements of the manufacturer holding the current Warranty.
SECTION 07 56 00
FLUID APPLIED MEMBRANE FLASHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Fluid applied membrane flashing.
   2. Preparation of substrate to receive flashing materials.

B. Related Sections:
   1. Section 07 52 16 - Modified Bitumen Roof System
   2. Section 07 52 20 - Roofing Installer’s Warranty
   3. Section 07 62 00 - Flashing and Sheet Metal

1.3 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Letter from the manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed flashing system.

D. Provide product data for each material to be employed in the Work.

1.4 QUALITY ASSURANCE

A. Product Quality Assurance Program: Flashing materials shall be manufactured under a quality management system that is monitored regularly by a third-party auditor under the ISO 9001:2000 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.

B. Agency Approvals: The proposed roof flashing system shall conform to the following requirements. No other testing agency approvals will be accepted.
   1. Underwriters Laboratories Class A acceptance of the proposed roofing system based upon testing performed in accordance with ASTM E 108 protocol.

C. Project Acceptance: Submit a completed manufacturer’s application for flashing guarantee form.
   1. The form shall contain all the technical information applicable to the project and materials proposed for installation.
   2. The form shall also contain accurate and complete information requested including proper names, addresses, zip codes and telephone numbers.
   3. The project must receive approval by the flashing manufacturer, through this process, prior to shipment of materials to the project site.
D. Scope of Work: Includes but is not limited to the following:

1. Attend necessary job meetings.
2. Furnish competent and full-time supervision, experienced roof mechanics, all materials, tools and equipment necessary to complete, in an acceptable manner, the flashing installation in accordance with this Specification.
3. Comply with the latest written application instructions of the manufacturer of the primary roofing/flashing products.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: The flashing system manufacturer shall provide direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary and conduct a final inspection upon successful completion of the project.

1.5 PRODUCT HANDLING, STORAGE AND DELIVERY

A. Deliver packaged materials to site in manufacturer's original, unopened labeled containers in quantities required to allow continuity of application.

B. All solvents, cleaners and coatings shall be stored in a fenced or other fully secured area. No material is to be stored in any existing building under any condition.

1. Lids shall be fully secured on the cans and materials shall not be allowed to mix with one another.
2. Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis.
3. Do not store resins at temperatures below 32°F (0°C) or above 85°F (29°C). Keep away from open fire, flame or any ignition source.
4. Store in a well-ventilated area. Resin products may auto-polymerize at temperatures greater than 140°F.

C. Handling:

1. Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter.
2. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air.
3. Avoid skin and eye contact with this material.
4. Avoid breathing fumes when above the Threshold Limit Value (TLV).
5. Do not eat, drink or smoke in the application area.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected, removed and replaced at the Contractor's expense.

1.6 JOB CONDITIONS

A. Requirements Prior to Job Start:

1. Notification: Give a minimum of 5-days’ notice to the Owner and manufacturer prior to commencing any Work and notify both parties on a daily basis of any change in Work schedule.
2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the Work.
3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NIOSH, NRCA and other industry or local governmental groups.
   a. Workers shall wear a long sleeve shirt with long pants and Work boots.
   b. Workers shall use only butyl rubber or nitrile gloves when mixing or applying fluid flashing products.
c. Safety glasses with side shields are required for eye protection.
d. Use local exhaust ventilation to maintain Worker exposure below the published Threshold Limit Value (TLV).
e. If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements published under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration.
f. A filtering face piece or dust mask is not acceptable for use with this product if TLV filtering levels have been exceeded.

B. Environmental Requirements:
   1. Precipitation: Do not apply fluid flashing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials and building interiors are protected from possible moisture damage or contamination.
   2. Temperature Restrictions – Primer Resins: Do not apply primer resin if there is a threat of inclement weather. Apply the primer resin while air temperature is between 32°F (0°C) and 104°F (40°C), and while the substrate temperature is between 32°F (0°C) and 122°F (50°C). Do not apply resin materials when ambient or substrate temperatures exceed that indicated above.
   3. Temperature Restrictions – Summer Grade Roofing Resins: Do not apply roofing resins if there is a threat of inclement weather. Apply membrane resin while air temperature is between 59°F (15°C) and 104°F (40°C), providing the substrate temperature is between 50°F (10°C) and 122°F (50°C). Do not apply materials when ambient or substrate temperatures exceed that indicated above.

C. Protection Requirements:
   1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces.

1.7 REFERENCE STANDARDS

A. References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions and societies which may be used as references throughout these specifications:
   1. ACI American Concrete Institute, Hills, MI
   2. ASTM American Society for Testing and Materials, Philadelphia, PA
   3. FM Factory Mutual Engineering and Research, Norwood, MA
   4. NRCA National Roofing Contractors Association, Rosemont, IL
   5. OSHA Occupational Safety and Health Administration, Washington, DC
   6. UL Underwriters Laboratories, Northbrook, IL

1.8 WARRANTY

A. Provide a two-year written warranty against defects in materials and Workmanship, beginning on the date of Substantial Completion of the overall Project, and executed on the form found in Section 07 52 20.

B. New Roof System: Fluid Applied Flashing to be included in roof membrane manufacturer’s 20-Year NDL Warranty.

PART 2 - PRODUCTS

2.1 MEMBRANE / FLASHING SYSTEM
A. Catalyst: A reactive agent used to induce curing of polymethylmethacrylate (PMMA) resins.
   1. Siplast  “Pro Catalyst”
   2. U.S. Ply  Manufacturer’s approved PMMA.
   3. Johns Manville  Seamfree™ PMMA Catalyst
   4. Soprema  ALSAN RS Catalyst Powder

   1. Siplast  “Parapro Roof Resin”
   2. U.S. Ply  Manufacturer’s approved PMMA.
   3. Johns Manville  Seamfree™ PMMA Flashing Resin
   4. Soprema  ALSAN RS 230 Flash

C. Membrane and Flashing Reinforcement: A polyester fabric reinforcement as supplied by the membrane system manufacturer.
   1. Siplast  “Pro Fleece”
   2. U.S. Ply  Manufacturer’s approved PMMA product.
   3. Johns Manville  Seamfree™ PMMA Scrim
   4. Soprema  ALSAN Polyleece

2.2 AUXILIARY MATERIALS

A. Elastomeric Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.

B. Cleaner/Solvent: A clear solvent used to prepare metal and plastic surfaces prior to application of the catalyzed resin flashing membranes and to reactivate transition areas of in-place resin flashing membranes at tie-ins and between staged coats of resin.

C. Preparation Paste: A multi-component, fast curing, PMMA-based paste used for remediation of depressions in substrate surfaces or other irregularities.
   1. Siplast:  “Pro Paste Resin”
   2. U.S. Ply:  Manufacturer’s approved product
   3. Johns Manville:  Seamfree™ PMMA Joint/Repair Paste
   4. Soprema:  ALSAN RS Paste

D. Tape: A white, flexible, coated cotton cloth tape designed for treatment of insulation panel joints and deck/wall transitions.
   1. Siplast:  “Pro Tape”
   2. U.S. Ply:  Manufacturer’s approved product
   3. Johns Manville:  Manufacturer’s approved product
   4. Soprema:  SORANATURE™ Seam Tape

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall examine the Contract Documents and all conditions which affect the quality of his Work. Deviations or unsatisfactory conditions shall be reported to the Owner’s Representative in writing. No Work shall proceed until conditions are satisfactory to meet requirements of the Contract Documents.

B. Conduct a pre-roofing conference with the manufacturer’s technical representative, applicator and architect prior to ordering materials and starting Work.
   1. Discuss the products and application techniques.
2. Written minutes shall be maintained and submitted by the Contractor to the Architect and Owner.
3. The Work and products may be adjusted depending on recommendations of the manufacturer’s technical representative.

3.2 SUBSTRATE PREPARATION

A. Preparation of roof penetrations to receive new membrane flashing: Grind and scrape away all loose dirt, rust, membrane and any other deleterious materials from the surfaces of the piping, conduit or other material scheduled to receive the new coating.

B. Wipe down affected surfaces with specified cleaner/solvent as recommended by the manufacturer.

C. Ply Sheet Application: Bond the modified bitumen ply sheet by adhesive application to the prepared substrate, utilizing minimum 3-inch side and end laps. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet. Follow manufacturer’s specifications regarding maximum exposure periods prior to application of the liquid-applied finish membrane.

3.3 MIXING OF RESIN PRODUCTS

A. Preparation/Mixing/Catalyzing Resin Products: Pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid for the time period specified by the resin manufacturer.

B. Calculate the amount of catalyst powder needed using the manufacturer’s guidelines and add the pre-measured catalyst to the primer. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. It is imperative that air is not entrained into the product during the mixing process. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process.

C. Mix only enough product to ensure that it can be applied before expiration of resin pot life.

3.4 FLASHING AND FIELD MEMBRANE APPLICATION

A. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to set.

B. Pre-cut reinforcing fabric to ensure a proper fit at transitions and corners prior to membrane application.

C. Apply an even, generous base coat of flashing resin using a roller at the manufacturer's recommended rate to prepared surfaces requiring flashing coverage.
   1. Work the reinforcing fabric into the wet, resin using a brush or roller to fully embed the reinforcing fabric in the resin and remove trapped air.
   2. Lap reinforcing fabric layers a minimum of 2 inch (5 cm) and apply an additional coat of resin between layers of overlapping fleece.
   3. Again, using a roller, apply an even top coat of resin immediately following embedment of the reinforcing fabric, ensuring full saturation of the reinforcing fabric.
   4. Ensure that the flashing resin is applied to extend a 0.25 inch (6 mm) beyond the reinforcing fabric. Remove the tape before the resin sets.
   5. Make allowances for saturation of roller covers and application equipment.
D. Should Work be interrupted for more than 12 hours or the surface of the resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing Work.

3.5 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.

B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.6 CLEANING

A. Clean all roofing surfaces free of overspray materials. Remove all excess materials.

B. Re-install materials which may have been removed during the Work and ensure all to be in working order.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Qualifications, Standards and Materials for sheet metal flashing.
   2. Fasteners.

B. Related Sections
   1. Section 06 10 50 - Roof Carpentry
   2. Section 07 52 16 - Modified Bitumen Roof System
   3. Section 07 52 20 - Roofing Installer’s Warranty
   4. Section 07 55 50 - Roof System Repairs
   5. Section 07 56 00 - Fluid Applied Flashing
   6. Section 07 72 00 - Roofing Accessories

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Metal Edge Securement: Except gutter, shall be installed as tested in accordance with the most current version of the ANSI/SPRI ES-1, American National Standard for Edge Systems Used with Low-Slope Roofing Systems.

C. Thermal Movements: Provide sheet metal roofing that allows for thermal movements resulting from 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.

D. Water Infiltration: Provide sheet metal roofing that does not allow water infiltration to building interior, with metal flashing and connections of sheet metal roofing lapped to allow moisture to run over and off the material.

1.4 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.
C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

D. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
   1. Identification of 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 joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   4. Details of termination points and assemblies, including fixed points.
   5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
   6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   7. Details of special conditions.
   8. Details of connections to adjoining work.
   9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches.

E. In the event that the Contractor intends to comply – without deviation – with the Drawings, shop drawings will not be required as part of this Section. Contractor shall include with initial submittals a letter confirming Contractor's intent to comply with the Drawings, or:
   1. Should any changes form the Drawings be anticipated – for whatever reason – submit detailed and accurate to-scale shop drawings, showing the changes and including all components.
   2. Include the date, project name and Drawing Detail number of the detail proposed for change.

F. Samples and Color Charts for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockups including but not limited to, typical roof eave, fascia, gutter, coping, scupper, collector head and downspouts, approximately 10 feet long or per individual item, including supporting construction cleats, seams, attachments and accessories.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Pre-installation Conference:
   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. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.7 WARRANTY
A. Warranty on Prefinished Metal: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed 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 SHEET METALS
A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
B. Sheet Metal Types:
   1. Galvanized Steel: Lock-forming quality G90, meeting ASTM A-653, in 24-gauge thickness, unless otherwise indicated below or on the Drawings.
   2. Stainless Steel: 24-gauge, ASTM A240, Type 304, fully annealed for fabrication of receivers for rooftop mechanical equipment where shown on the drawings.
   3. Prefinished Metals: 24-gauge, Galvalume® steel, treated, primed and prefinished under precision conditions.
      a. Exposed Finish: Kynar 500® Fluorocarbon coating. Bottom or unexposed side: manufacturer's standard primer coat. Use for all metals indicated on the Drawings and shown hereafter to be exposed to view, and not designated for other metal types.
      b. Color: Selected by the Owner from the manufacturer’s standard choices.
      c. Provide pre-finished metal with manufacturer’s standard twenty (20) year finish warranty.
      d. Deliver pre-finished metal to site with factory-applied protective plastic film, to be removed immediately upon installation.

2.2 UNDERLAYMENT MATERIALS
A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
3. Products: Subject to compliance with requirements, provide one of the following:
   a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.

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 and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

C. Fastener Types:
   2. Exposed Fasteners: All exposed fasteners to receive metal-jacketed neoprene or EPDM washers.
      a. All sheet metal fasteners shall be stainless steel.
      b. Omit washers where fasteners attach counterflashing to receivers, straps to gutters and downspouts to walls.
      c. Exposed horizontal surface fasteners are unacceptable.
      d. Other cleats, screws, rivets, bolts, etc.: Matching material to which they attach, or be galvanically compatible to the surface to which they are secured.
   3. Neoprene-Head Screws: #10 or #12 stainless steel screws, with hexagonal heads and matching color metal jacketed neoprene rubber washer.
   4. Stainless Steel Masonry Nailer Washers: EPDM sealing washers bonded to Type 304 stainless steel jackets; Rawl EPDM Sealing Washers, or approved equal; 3/4-inch diameter.
   5. Steel Masonry Nails: Steel pin and zinc-jacketed fastener; Zamac “Hammer Screw,” or approved equal. Size: 1/4-inch x 1-1/2 inches.
   6. Roofing Nails:
      a. Stainless steel for fastening into treated lumber.
      b. Size as required to suit application; minimum 11-gauge with 3/8-inch diameter head.
   7. For Stainless Steel Sheets: Series 300 stainless steel.
   8. For Galvanized Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153 or ASTM F2329.

D. Miscellaneous Sheet Metal-Related Materials:
   1. Lead Drain Flashing: 36” x 36” x 4# sheet lead.
   2. Lead Vent Flashings: 4# sheet lead preformed vent flashing with 4-inch wide roof flange, minimum finished height of 8 inches above roof surface, and minimum 1-inch turn down into top of pipe.
   4. Sealant: Sonneborn NP-1, or an approved equal. One component urethane gun-grade sealant, meeting ASTM C-920, Type S, Grade NS.
   5. Solder:
      a. Galvanized steel: ASTM B32, with maximum lead content of 0.2 percent.
      b. Stainless steel: ASTM B32, Grade Sn60 or Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.

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, geometry, metal...
thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

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.
   1. Obtain field measurements for accurate fit before shop fabrication.

C. Form 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. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

D. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in SMACNA.

E. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

F. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal or as shown in the drawings.

2.5 SHEET METAL FABRICATIONS

A. Galvanized Sheet Metal Items:
   1. General: Where applicable, match existing screw and nail attachments with fasteners that are one size larger than existing.
   2. Counterflashings at Rooftop Units & Exhaust Fans: Attach receivers as shown on Drawings and noted hereafter. Attach counterflashings to receivers with sheet metal screws spaced at 16 inches on centers.
   3. Equipment Curb Caps: All joints fully soldered. Attach to curbs per Drawings.
   4. Flanged Vents: All joints fully soldered.
      a. Provide with minimum 4-inch wide flange for stripping into new roof assembly.
      b. Attach flange to substrate wood blocking with stainless steel roofing nails spaced at 3-inches on center, staggered.
   5. Hook Strips: Minimum 22-gauge. Nail at 8 inches on centers, with roofing nails.
   6. Termination Bars: 12-gauge or 1/8-inch x 1 inch stainless steel bar stock fastened with specified drive pins spaced at 12 inches on centers with minimum ¾-inch embedment.
   7. Metal Splash Pans: 24-gauge, galvanized steel, formed to shape shown on Drawings.
   8. Downspout Boots: 12-gauge with continuous welded or seamed connection.
      a. Anchor to walls with 12-gauge x 2-inch straps placed top and bottom of boot, and at midpoint when boots exceed 72 inches in length.
      b. Anchor straps to masonry walls with 1/4-inch expansion sleeve bolts.
      c. Anchor brackets to boot with four (4) stainless steel sheet metal screws, length as required, per bracket. Provide two (2) screws each side, anchoring bracket to boot.
      d. Make boots 96-inches maximum length and include all required bends, changes in direction and other accompaniments as required by the Work.
      e. Extend boots directly into transition piece portion of subgrade drainage system. (See Civil Engineering documents for transition piece and drainage system).
   9. Downspout Drop: 24 gauge with all joints fully soldered.

B. Stainless Steel Sheet Metal items:
   1. General: Where applicable, match existing screw and nail attachments with fasteners that are one size larger than existing.
2. Counterflashing and Receivers at Rooftop Units: Where shown on the Drawings, attach counterflashings to receivers with sheet metal screws spaced at 12-inches on center.
3. Thru-Wall Flashing & Receiver: Form to shape and secure as shown on Drawings.

C. Pre-Finished Sheet Metal Items:
1. General: Where applicable, match existing screw and nail attachments with fasteners that are one size larger than existing.
2. Copings: Hook at outside face on continuous 22-gauge galvanized cleat. Secure back leg with neoprene-head screws at 12-inches on centers. Provide 1-inch high standing seams at all corners and joints.
3. Counterflashings except at Rooftop Units & Exhaust Fans: Attach receivers as shown in Drawings and noted hereafter. Attach counterflashings to receivers with sheet metal screws spaced at 16 inches on centers.
4. Gutters: Fastened at 6 inches on center to substrate wood nailers with stainless steel wood screws and having 12-gauge x 1-inch galvanized steel straps spaced at 30 inches on centers. Straps shall be anchored with stainless steel sheet metal screws to gutter front edge and back face.
5. Downspouts: Transition from downspout to gutter with 24-gauge galvanized fully soldered drops.
   a. Attach downspouts to masonry walls with 12-gauge x 1-inch galvanized steel "U" shaped brackets with two (2) zinc-jacketed masonry drive pins per bracket.
   b. Anchor brackets to downspouts with four (4) stainless steel sheet metal screws, 1/2-inch maximum length, per bracket. Provide two (2) screws each side, anchoring bracket to downspout. Space brackets uniformly at 60 inches on centers
   c. Extend minimum 2-inches into downspout boots. Cover straps with prefinished metal.
7. Expansion Joint Covers.
8. Expansion Joint Hook Strips (Cleats): Attach with neoprene-head screws spaced at 12 inches on centers.
9. Fascia Metal Below Edge Metal: Hook at face on continuous 22-gauge galvanized cleat and nail upper flange at 12-inches on centers, with specified roofing nails. Lap joints 3 inches, with concealed sealant pressed between components. Do not rivet or otherwise fix laps.
10. Edge Metal and Cover Plates: Hook at face on continuous 22-gauge galvanized cleat and nail flange at 3-inches on centers, staggered, with stainless steel roofing nails.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Coordinate all sheet metal Work with other roofing Work and other trades on this Project with correct sequencing of items making up the entire Project.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION
A. General: Install underlayment as indicated on Drawings.
B. Self-Adhering Sheet Underlayment:
   1. Install self-adhering sheet underlayment, wrinkle free.
   2. Apply primer if required by underlayment manufacturer.
   3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures.
   4. Apply in shingle fashion to shed water, with end laps of not less than 6-inches staggered 24-inches between courses.
5. Overlap side edges not less than 4 inches.
6. Roll laps with roller.
7. Cover underlayment within 14 days.

3.3 INSTALLATION

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. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
4. Install sealant tape where indicated.
5. Torch cutting of sheet metal flashing and trim is not permitted.

B. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10-feet with no joints allowed within 24-inches of corner or intersection. Expansion joint covers, expansion breaks or other devices needing these shall be fitted with watertight standing seam joints allowing for lateral expansion as dictated by gauge of metal, "stretch out" or exposure, and latest printed SMACNA guidelines and criteria.

C. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.

D. Rivets: Rivet joints connected by stainless steel rivets spaced at 2-inches on center where indicated and where necessary for strength.


F. All metal flanges, flashings and other metal items in contact with bituminous roof assembly are to be completely primed with asphalt cut back type primer and, as applicable, set in uniform bed of plastic cement for horizontal surfaces or flashing cement for vertical surfaces.
1. Strip-in metal flanges with specified stripping plies on the same day they are installed.
2. When gutters are included in the roof edge assembly, the gravel guard metal must be installed simultaneously with the gutter and flashed with specified stripping plies on the same day they are installed.

G. All joints, other than those receiving standing seam or cover and back plates, in galvanized sheet metal edgings, accessories, flanges and umbrellas, etc. shall be connected by stainless steel blind rivets spaced at 2 inches on center and fully soldered completely watertight.

H. Fabricate new metal in longest practical lengths up to ten feet, to minimize joints.

I. Counter-flashing and receiver joints shall be lapped a minimum of 4 inches and have a ¼-inch bead of sealant pressed between the pieces.
1. The sealant shall not be visible from the exterior.
2. The bottom hemmed edge of the counter-flashing shall be neatly hooked in bayonet fashion.
3. Metal counter-flashings shall completely cover all fasteners used to hold in place top terminations of composition base flashings.
J. Install all sheet metal flashings and accessories in accordance with the latest printed SMACNA guidelines and in accord with recognized roofing and sheet metal industry standards.
   1. Fit flashings tightly in place using square and true mitered corners.
   2. Surfaces shall be true and straight and lines accurate to profiles encountered.

K. Install new 6-inch wide cover and backer plates at all new edge metal.
   1. Fabricate of matching metal and suitable profile to ensure complete and permanent watertight integrity of metal joint.
   2. Fasten adjoining 10-foot metal gravel guard sections as per most current SMACNA requirements.
   3. New cover plates shall be set in specified sealant. Mastic shall not be used in the jointing of edge metal corners or cover and backer plates.
   4. Cover plates shall be neatly bent along the edges to hug the gravel guard over which they are installed. Gaps of more than 1/16 inch are not permitted.
   5. Nail edge metal in place not more than 3 inches on centers; in a staggered pattern.
   6. Cover plate joints shall be symmetrically laid out so that opposite end sticks of metal are of the same length with all lengths in between being the same. Prepare sample layouts in the field for the Architect's approval prior to proceeding with the Work.

L. Lay out cover plate joints symmetrically, so that opposite end sticks of metal are of the same length with all lengths in between being the same. Provide sample layouts in the field for the Architect's approval.

3.4 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in Manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces.

E. Do not use touch-up paint to cover any fasteners, metal or other component unless specifically approved in writing in advance of the Work. Any use of touch-up paint without prior approval shall result in affected components being removed and replaced at Contractor's expense.

END OF SECTION
SECTION 07 65 00
THRU-WALL FLEXIBLE FLASHING AND DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes combination flashing, mortar deflection, and weep as complete one step system.

B. Related Sections:
   1. Section 04 05 23 – Masonry Accessories.
   2. Section 04 72 00 – Cast Stone.
   3. Section 04 20 00 – Unit Masonry Assemblies.
   4. Section 06 10 00 – Rough Carpentry.
   5. Section 07 27 20 – Fluid-Applied Air Barrier Assembly
   6. Section 07 62 00 – Flashing and Sheet Metal.

C. Alternates: This Section replaces the multiple component technology and multiple trade involvement of older technologies; providing a single source/single trade engineered and warranted system.

1.2 REFERENCES

A. Standards of the following as referenced:
   1. ASTM.
   2. Brick Industry Association (BIA).

B. Industry standards:

1.3 DEFINITIONS

A. Terms:
   1. Cavity wall flashing: Same as flexible flashing.
   2. Foundation sill flashing: Same as flexible flashing.
   3. Flexible flashing: Water-proof material typically used in cavity wall construction to contain and assist in the proper water drainage that may penetrate wall system veneer. Other materials may be required to constitute the system.
   4. Head and sill flashing: Same as flexible flashing.
   5. Through-wall flashing:
      a. Generally considered the same as flexible flashing.
      b. Rare definition referred to full width cap flashing under copings or wall caps.

1.4 SUBMITTALS

A. Product data: Indicate material type, composition, thickness, and installation procedures.

B. Samples: 3 inch by 5 inch flashing material.

C. Product Quality & Environmental submittals:
1. Certificates:
   a. Indicate materials supplied or installed are asbestos free.
   b. Indicate recycled content: A minimum of 60 percent total recycled material; based on 60 percent Post Industrial Recycled Content.

2. Critical Performance Attributes:
   a. Tensile Strength, stainless steel 100,000 psi average, copper 32,000 psi average
   b. Puncture Resistant, >stainless steel 2,500 psi average, copper 450 psi average
   c. When tested as manufactured, product resists growth of mold pursuant to test method ASTM D3273.

D. Fire Rating: flame spread and smoke generation; Rated Class A, ASTM E84

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer: Provide flashing materials by single manufacturer with not less than twenty five years of experience in manufacturing flexible flashing products.
   2. Flashing materials must be able to withstand 400 degrees F temperatures without changing the long term performance of the flashing if product is used with spray polyurethane foam.

1.6 WARRANTY

A. Special warranty:
   1. Manufacturer: Warrant flexible flashing/drainage system material for life of the wall.
   2. Begin warranty at Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Metal core flexible flashing with drainage fabric:
   1. Product standard of quality: York Manufacturing, Inc.; York Flash-Vent SS.
   2. Accepted products:
      b. STS Coatings, Inc.; Wall Guardian TWF Stainless Steel (www.stscoatings.com)
      c. York Manufacturing, Inc.; York Flash Vent Copper AB (www.yorkmfg.com)
      d. STS Coatings, Inc.; Wall Guardian TWF copper (www.stscoatings.com)
      e. Other flashings that meet the requirements in section 1.4.C.

B. Characteristics:
   1. Type: Engineered system, with high resistant to damage, composite with a stainless steel or copper core with non-asphalt adhesive polymer fabric laminated to one stainless steel or copper face and non-woven drainage fabric laminated to opposing face with non-asphalt adhesive.
   2. Stainless steel: ASTM A167
   3. Copper sheet: ASTM B370-11
   4. Fabrics:
      a. Polymer fabric; laminated back face to metal core
      c. Recycled content: copper is 90 percent recycled, stainless steel is 60 percent recycled
d. Size: Manufacturer’s standard width rolls.

C. Polyether sealant: Product standard of Quality is York Manufacturing’s UniverSeal US-100
   1. Acceptable products:
      a. STS Coatings; GreatSeal LT-100
      b. York Manufacturing; UniverSeal US-100

D. Corner and splice material: York Multi-Flash pre-manufactured corners and end dams. Splice material Multi-Flash or York Copper Splice and Flash Tape.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install where indicated, specified, or required in accord with flashing manufacturer’s written instructions and as follows.
   1. Prohibited practice: Tucking the flashing into the backer wall.

B. Extend flashing 6 inches minimum, beyond opening, each side without stretching flashing material. Fold flashing ends at end of openings or horizontal flashing terminations to form end dam or use preformed end dams from manufacturer.

C. Flashing width: Width required starting flush with outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2 inches.

D. Splice end joints by butting ends together over 12 inch wide piece of Multi-Flash copper flashing and sealing lap joint with UniverSeal US-100 polyether sealant or by using a 6 inch wide piece of Copper Splice & Flash Tape and butting flashing over the top of the tape and then sealing butt joint with polyether sealant.

E. Masonry back up:
   1. Surface mount flashing after damp proofing installation specified in Damp Proofing Section in accord with manufacturer’s installation instructions.
   2. Apply flashing with drainage surface to outside.
   3. Fasten to masonry back-up surface at top by embedding in layer of UniverSeal US-100 polyether sealant and use a termination bar, like the T96 by York, to fasten to the backer wall and seal the top of the termination bar with UniverSeal US-100 polyether sealant or use the termination clamp from York.

F. Concrete Back Up:
   1. Surface mount flashing after damp proofing installation specified in Damp Proofing Section in accord with manufacturer’s installation instructions.
   2. Apply flashing with drainage surface to outside.
   3. Fasten to concrete back-up surface at top by embedding in layer of UniverSeal US-100 polyether sealant and use a termination bar, like the T96 by York, to fasten to the backer wall and seal the top of the termination bar with UniverSeal US-100.
G. Stud Back Up with Sheathing:
   1. Surface mount flashing after certified compatible damp proofing installation
      specified in Damp Proofing Section in accord with manufacturer’s installation
      instructions.
   2. Apply flashing with drainage surface to the outside.
   3. Fasten to stud back-up surface at top by embedding in layer of UniverSeal
      US-100 polyether sealant and use a termination bar, like the T96 by York, to
      fasten to the backer wall and seal the top of the termination bar with
      UniverSeal US-100.

H. Confirm compatibility with manufacturer’s mutual letters for all lapping components,
   Air barrier installation lapping over flashing top in the Air Barrier Section.

I. Lay flashing in continuous bead of UniverSeal US-100 polyether sealant on masonry
   supporting steel.

J. Fold ends of flashing at end of opening to form dam; seal with UniverSeal US-100
   polyether sealant or purchase preformed end dams from manufacturer.

K. Inside corners: Make in manufacturers accepted manner using corner and splice
   material or purchase preformed corners from manufacturer.

L. Outside corners: Make in manufacturers accepted manner using corner and splice
   material or purchase preformed corners from manufacturer.

M. Do not coat the entire drainage fabric with air barrier. Leave the drainage fabric
   exposed at least an inch over the top of the mortar droppings.

N. Cover flashing within a few days of installation to protect it from damage from the
   different trades, the environment and falling debris. If flashing is left unprotected and
   it is punctured, torn, or has loose scrim you should contact the manufacturer for repair
   instructions.

3.2 SCHEDULES

A. Locations:
   1. Exterior door heads.
   2. Window heads and sills.
   4. Horizontal control joints.
   5. Changes in veneer materials, vertically.
   6. Other wall openings.
   7. Other locations indicated.

END OF SECTION
SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 through Division 26 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Pipe supports.
   2. Roof curbs.
   3. Equipment supports.

B. Related Sections
   1. Section 07 52 16 - Modified Bitumen Roof System
   2. Section 07 55 50 - Roof System Repairs
   3. Section 07 62 00 - Flashing and Sheet Metal

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.4 SUBMITTALS

A. Comply with provisions of Division 01.

B. Mark each product data cut-sheet by circling or highlighting, and affix the corresponding Article and Paragraph designations from this Specification Section. Product data not so marked will be returned without review, for re-submittal complying with the above requirements.

C. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

1.5 PRODUCT DELIVERY, STORAGE, HANDLING AND CONDITIONS

A. Materials shall be delivered in bulk as necessary so as to provide continuous operations and without hindrance of the Work.
   1. Schedule and coordinate with Owner all necessary deliveries so as to cause the least amount of inconvenience to Owner’s daily activities.
   2. All deliveries and unloading or loading activities shall be the responsibility of the Contractor. The Owner will not take any responsibility for Contractor's deliveries.

B. Store all necessary materials in such a manner so as to keep from damage by elements or construction and other traffic at all times. Storage of materials on the roof surface is prohibited without adequate blocking to prevent damage to the existing or new roof surfaces.
C. Fit accessory Work to other Work. Scribe and cope as required for accurate fit.

1.6 WARRANTY

A. Provide a one-year warranty covering defects in materials and workmanship for all products specified in this Section.

PART 2 - PRODUCTS

2.1 PIPE SUPPORTS

A. Reuse of existing supports or support pads is not acceptable.

B. All piping supported on the roof surfaces shall be one of the following systems, with the hardware for each system being provided by this Contractor. Furnish and install all curbs and flashings, traffic support pads, sheet metal flashings, etc., as required for the proper installation of these systems.

C. Pipe Support – Type “A”: Provide for support of single condensate lines 1 inch outside diameter and less, and all PVC lines.
1. Space supports at maximum distance of 8'-0" on center or less to prevent sag or deflection.
2. Place supports within 12 to 18 inches of all “ell” corners, pipe bends, tee intersections and below each pipe or conduit joint.
3. Manufacturer/Model (Where positive slope is provided in structure / roofing system: OMG “Mini,” or an approved equal.
4. Manufacturer/Model (Where positive slope is not provided in structure / roofing system: OMG “Height Adjustable Struct OMG Pipe Guard”, or an approved equal.

D. Pipe Support – Type “B”: Provide for support of single gas lines / electrical conduit 2-inches outside diameter and less.
1. Space supports at maximum distance of 8'-0" on center or less to prevent sag or deflection.
2. Space supports at maximum distance of 6'-0" on center or less to prevent sag or deflection where piping or conduit is greater than 1-1/4 inches outside diameter.
3. Place supports within 12 to 18 inches of all “ell” corners, pipe bends, tee intersections and below each pipe or conduit joint.
4. Provide retainer bracket to prevent pipe from lifting from the lower rollers.
5. Manufacturer/Model: Portable Pipe Hanger “PP-10 with Roller,” or an approved equal.

E. Pipe Support – Type “C”: Provide for support of single gas lines / electrical conduit greater than 2 inches outside diameter and less than 3-1/2" outside diameter.
1. Space supports at maximum distance of 8'-0" on center or less to prevent sag or deflection.
2. Place supports within 12 to 18 inches of all “ell” corners, pipe bends, tee intersections and below each pipe or conduit joint.
3. Manufacturer/Model: Portable Pipe Hanger “PS-1-2,” or an approved equal.

F. Pipe Support – Type “D”: Provide for gas piping / electrical conduit in excess of 3-1/2 inches outside diameter.
1. Pipe Roller: Stainless Steel Rods and Axle with Cast Iron Roller and Galvanized Sockets as manufacturer by Cooper B-Line or an approved equal.
2. Roller support assemblies are to be composed of a steel strut channel with 12-gauge galvanized brackets welded to strut and mounted with galvanized steel bolts through neoprene washers into metal-capped curb assemblies.
3. Provide retainer bracket to prevent pipe from lifting from the lower rollers. Install upper and lower rollers so as to not bind pipe and prevent movement.
4. Space supports at maximum distance of 8'-0" on center or less to prevent sag or deflection.
5. Place supports within 12 to 18 inches of all “ell” corners, pipe bends, tee intersections and below each pipe or conduit joint.

G. Small Electrical Lines:
1. All electrical lines of less than 1-inch outside diameter shall be placed in a run of galvanized steel Unistrut channel laid across the top of curbs or Type “B” pipe supports.
2. Ends of channels and corners shall be connected with bolted plates.
3. Secure channels by 16-gauge galvanized steel straps to the curbs or pipe supports.

H. Pipe Support Protection Pads:
1. Type A: Protection pad below pipe support base.
   a. U.S. Ply DuraFlex G4 FR SBS
   b. Siplast Paradiene 30 FR
   c. Johns Manville DynaKap FR
   d. Soprema Elastophene Flam FR
2. Type B & C: Protection pad below pipe support base.
   a. U.S. Ply USP SBS Walkboard
   b. Siplast ParaTread
   c. Johns Manville DynaTred
   d. Soprema Sentinel

2.2 ROOF CURBS

A. Pre-manufactured Steel Curbs: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings.
   1. Manufacturer: Thybar Corp., www.thybar.com or approved equal.
   3. Shop Fabrication: Shop fabricated curbs are not acceptable.
   4. Coordinate with Mechanical Contractor as to which mechanical equipment is being provided with pre-manufactured curbs. If so, those curbs shall be installed by the Mechanical Contractor; flashing, counterflashing and sealing of roof system to the curbs shall be by Roofing Contractor.

B. Construction:
   1. Frames: 18-gauge G90 hot-dipped galvanized sheet steel and base plate with all joints fully welded complying with ASTM A653. Bolted connections are not acceptable.
   2. Wood Nailers: Factory installed; pressure treated. Size and width as suitable for support of mechanical equipment mounted on curbs.
   3. Reinforcement: Internally reinforce curbs exceeding 3-foot length and as required to support mechanical equipment.
   4. Gasketing: ¼-inch thick x 1-inch wide at rooftop units.
   5. Counterflashing: As indicated on the drawings.
   6. Insulation: 1-1/2” thick 3-pound density rigid insulation.
   7. Curb Height: Coordinate curb height to comply with roofing drawings. Minimum height above roof surface shall be measured from the highest side of sloped roof.
   8. Roof Slope: Curbs shall be constructed to match roof slope with plumb and level top surface for mounting mechanical equipment.

2.3 EQUIPMENT SUPPORTS

A. Equipment Supports: Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings.
   1. Manufacturer: Thybar Corp., www.thybar.com or approved equal.
3. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
4. Shop Fabrication: Shop fabricated equipment supports are acceptable if they meet the requirements of the specifications and drawings.
5. Coordinate with mechanical contractor to determine if any equipment supports are being furnished with respective equipment. If so, those curbs shall be installed by the Mechanical Contractor; flashing, counterflashing and sealing of roof system shall be by Roofing Contractor.

B. Construction:
1. Material: Galvanized steel sheet, 18 gauge with welded joints.
2. Insulation: Fill curb with fiberglass batt insulation.
3. Factory-installed continuous wood nailers at tops of equipment supports.
4. Provide a 24-gauge galvanized sheet metal cap with fully soldered or welded joints.
   a. Secure caps with stainless steel screws with neoprene-head washers spaced at 16-inches on center max. with a minimum of two screws on each side.
   b. Curb sides with dimensions of less than 8 inches require one fastener per side.
5. Fabricate equipment supports to minimum height of 12 inches above the finished high side roof surface unless otherwise indicated.
6. Roof Slope: Equipment supports shall be constructed to match roof slope with plumb and level top surface for mounting equipment.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL
A. Inspect existing conditions to determine that all Work preceding this installation is as intended and is of sound construction. Proceeding with the Work of this Section indicates acceptance of all conditions.
B. All installations shall be in accordance with the manufacturer’s printed instructions and as shown on the Drawings.

3.2 PIPE SUPPORT INSTALLATION
A. Non-Penetrating Pipe Supports (Types A, B & C):
   1. Assemble pipe supports with protection pad as shown on the Drawings. Adhere supports solid to protection pads in specified sealant.
   2. Set pad assemblies on the modified bitumen roof membrane. Do not adhere to roof system.
   3. Securely strap electrical conduit or Unistrut carrying electrical conduit to supports with galvanized steel straps.
   4. Loosely strap gas piping to support with galvanized steel straps. Straps shall allow free movement of piping, but not allow piping to lift more than 1 inch from support.
B. Penetrating Curbed Roller Pipe Supports (Type D):
   1. Anchor new curbs to existing deck or wood blocking using #12 coated insulation screws spaced at 8 inches on center, or a minimum of two per side.
   2. Flash curbs to the roof per the respective Section.
   3. Set new galvanized metal caps as shown on the Drawings.
   4. Set new roller assemblies and anchor securely to curbs with neoprene-head screws.
   5. Strap tops of pipes to roller assemblies.

3.3 OTHER ASSEMBLY INSTALLATION
A. Equipment Supports and Curbs: Anchor supports and curbs to deck or wood blocking as shown on the Drawings using #12 coated insulation screws or lag bolts spaced at 8-inches on centers, or minimum of
two per side.

B. Other Assemblies: Install as indicated on the Drawings, as required by the manufacturer or as designated above.

3.4 CLEANING

A. Clean all items of this Section in accordance with the respective manufacturer’s instructions.

END OF SECTION
SECTION 07 80 11
CEMENTITIOUS FIREPROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Replacement of cementitious fireproofing, spray-applied to structural steel and metal decking missing or damaged prior to or as part of the Work.

1.2 RELATED SECTIONS
A. Section 01 22 00 – Unit Prices.
B. Section 01410 – Special Testing and Inspection Services.
C. Section 05120 – Structural Steel.
D. Section 05210 – Steel Joists.
E. Section 05310 – Metal Decking.
F. Section 07840 – Firestopping.

1.3 REFERENCES
A. ASTM E72 - Method For Conducting Strength Tests of Panels for Building Construction.
D. ASTM E605 - Test Methods For Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.
E. ASTM E736 - Test Method For Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
F. ASTM E761 - Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.

1.4 PERFORMANCE REQUIREMENTS
A. Cementitious Fireproofing System: Provide fire resistive assembly rating of 1 hour for roof assemblies to a UL Design acceptable to local building authorities. Substitution of "N" and "S" designs shall be in accordance with allowable substitutions in ICBO and UL Fire Resistance Directory, "Application of N- and S- Designs to Floor and Roof Assemblies".
B. Manufacturers of products requiring substitution of UL design assemblies specified shall demonstrate the ability to provide the required fire endurance ratings.

1.5 SUBMITTALS
A. Submit under provisions of Section 01300.
B. Product Data: Provide data indicating product characteristics, performance and limitation criteria.
C. Test Reports: Indicate the following:
   1. Bond Strength of Fireproofing: ASTM E72, tested to provide minimum bond strength twenty times weight of fireproofing materials.
2. Fire test reports of fireproofing application to substrate materials similar to project conditions.
3. Reports from reputable independent testing agencies about product proposed for use, which indicate conformance to ASTM E119 and ASTM E84.

D. Manufacturer's Installation Instructions: Indicate special procedures and any perimeter conditions requiring special attention.
E. Manufacturer's Certificate: Certify that product meets or exceeds specified requirements.
F. Manufacturer's Field Reports: Submit under provisions of Section 01300.
G. Manufacturer's Field Reports: Indicate environmental conditions under which fireproofing materials were installed.

1.6 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.
B. Applicator: Company specializing in applying the work of this Section with minimum 3 years documented experience and approved by manufacturer.

1.7 REGULATORY REQUIREMENTS
Conform to applicable code for fire resistance ratings.

1.8 MOCKUP
A. Provide mockup of applied cementitious fireproofing as directed by Architect.
B. Construct mockup, 100 sq ft. Conform to project requirements for fire ratings and density of application.
C. Locate where representative components are incorporated into mockup.
D. Examine installation within one hour of application to determine variance due to shrinkage, temperature, and humidity.
E. Where shrinkage and cracking are evident, adjust mixture and method of application as necessary. Remove materials and re-construct mockup.
F. Subject to approval, mockup may remain as part of the Work.

1.9 PRE-INSTALLATION CONFERENCE
Convene one week prior to commencing Work of this Section.

1.10 ENVIRONMENTAL REQUIREMENTS
A. Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 40 degrees F.
B. Provide ventilation in areas to receive fireproofing during and 24 hours after application to dry material.
C. Provide temporary enclosure to prevent spray from contaminating surrounding air.
1.11 SEQUENCING

Sequence Work in conjunction with placement of ceiling hanger tabs, mechanical component hangers and electrical components.

1.12 WARRANTY

A. Provide five year warranty.

B. Warranty: Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering. Reinstall or repair failures.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Southwest Vermiculite Co., Inc. - Type 5.

B. W.R. Grace Co.; Monokote MK-6/HY

C. Mandoval Vermiculite Products, Inc.; Mandolite CP-2.

D. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

A. General: Provide fireproofing materials and installation in accordance with the designs in the UL "Fire Resistance Directory".

B. Cementitious Spray Fireproofing: Factory mixed, cementitious material blended for uniform texture; conforming to following requirements:
   1. Bond Strength: ASTM E736, 200 psi when set and dry.
   2. Bond Impact: ASTM E760, no cracking, flaking or delamination.
   3. Dry Density: ASTM E605, minimum average density of 15 lb/cu ft, with minimum individual density of any test sample of 13 lb/cu ft.
   4. Compressive Strength: ASTM E761, Less than 10 percent when subjected to 1200 psf compression and not deform less than 10%.

C. Fiber Reinforcement: Mineral, inorganic, type.

D. Primer Adhesive: Of type recommended by fireproofing manufacturer or where required by UL Design.

E. Non-metallic Mesh: Mesh listed and required by UL Design or recommended by manufacturer.

F. Water: Clean, potable.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify condition of existing fireproofing and identify areas requiring reapplication of cementitious fireproofing in order to comply with applicable codes.
B. Verify that surfaces are ready to receive Work.
C. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
D. Verify ducts, piping, equipment, or other items that would interfere with application of fireproofing are not positioned until fireproofing Work is complete.
E. Verify that voids and cracks in substrate are filled and projections are removed where fireproofing is exposed to view as a finish material.

3.2 PREPARATION
A. Clean substrate of dirt, dust, grease, oil, loose material, or other matter that may affect bond of fireproofing.
B. Remove incompatible materials that affect bond by scraping, brushing, scrubbing, or sandblasting.

3.3 PROTECTION
A. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fallout, and dusting.
B. Close off and seal ductwork in areas where fireproofing is being applied.

3.4 APPLICATION
A. Install metal lath over steel joists and as indicated on shop drawings.
B. Apply primer adhesive, fireproofing and overcoat in accordance with manufacturer’s instructions.
C. Apply fireproofing in sufficient thickness to achieve rating with as many passes as necessary to cover with monolithic blanket of uniform density and texture.

3.5 FIELD QUALITY CONTROL
A. Inspect the installed fireproofing after application and curing for integrity of fire protection prior to concealment of Work.
B. Re-inspect the installed fireproofing for integrity of fire protection after installation of subsequent Work.

3.6 CLEANING
A. Remove excess material, overspray, droppings and debris.
B. Remove fireproofing from materials and surfaces not required to be fireproofed.

3.7 SCHEDULE

ROOF CONSTRUCTION
Primary Members 1 HR P732
Secondary Members 1 HR P732

END OF SECTION
SECTION 07 84 00
FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. Firestopping: “A process whereby certain materials, some of them specially manufactured, are used to resist (or stop) the spread of fire and its byproducts through openings made to accommodate penetrations in fire-rated walls, floors, and floor/ceiling assemblies.” As defined by the International Firestop Council.

1.3 SYSTEM DESCRIPTIONS

A. Only tested firestop systems shall be used in specific locations as follows:
   1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
   2. Gaps between edge of floor slabs and curtain walls.
   3. Openings between structurally separate sections of wall or floors.
   4. Gaps between the top of walls and ceilings or roof assemblies.
   5. Expansion joints in walls and floors.
   6. Openings around structural members which penetrate floors or walls.
   7. Other locations where specifically shown on the drawings.

1.4 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
   1. Section 03 30 00 – Cast-In-Place Concrete.
   2. Section 04 22 00 – Unit Masonry Assemblies.
   3. Section 05 31 00 – Metal Roof Deck.
   4. Section 07 92 00 – Joint Sealants.
   6. Division 15 – Plumbing Piping.
   7. Division 15 – Piping Insulation.
   8. Division 15 – Basic Mechanical Requirements.

1.5 REFERENCES

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually with a mid-year supplement.

UL Fire Resistance Directory:

1. Through-Penetration Firestop Devices (XHCR).
2. Fire Resistance Ratings (BXUV).
3. Through-Penetration Firestop Systems (XHEZ).
4. Fill, Voids, or Cavity Material (XHHW).
5. Forming Materials (XHKU).


D. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

E. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building

F. All four major building codes: IBC, ICBO, SBCCI, and BOCA.


1.6 QUALITY ASSURANCE

A. Applicator: Company specializing in performing the Work of this section with a minimum of three years’ experience as an approved Installer. Installer must be certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer’s products per specified requirements.

B. Firestop System installation must be tested in accordance with ASTM E814, UL 1479, or UL 2079; and tested assemblies must provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not re-establish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no UL tested system is available through any manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation.

F. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos -free Certification will be returned to the Contractor with no action taken until such Certification is provided.
1.7 SUBMITTALS

A. Submit Product Data: Manufacturer’s specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer’s installation instructions to comply with Section 01 33 00.

B. Manufacturer’s engineering judgment identification number and drawing details when no UL system is available for an application.

C. Submit material safety data sheets provided with product delivered to jobsite.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer’s clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at jobsite.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer’s requirements.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.9 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather Conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer’s recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through-penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified in Section 3.05:
2.2 MATERIALS

A. Use only firestop products that have been ASTM E814, UL 1479, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. For penetrations by non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following materials are acceptable:
   2. Hilti FS One Intumescent Firestop Sealant
   3. Hilti CP 680/681 Cast-in-Place Firestop Devices
   4. Hilti CP 620 FireFoam
   5. Hilti CP 604 Self-Leveling Firestop Sealant
   6. 3M Fire Barrier CP25, CP25WB or CP25WB+
   7. 3M Fire Barrier Moldable Putty Stick.

C. For fire-rated construction joints and other gaps, the following materials are acceptable.
   1. Hilti CP 672 Speed Spray
   3. Hilti CP 606 Acrylic Firestop Sealant
   4. Hilti CP 604 Self-Leveling Firestop Sealant
   5. 3M Fire Barrier FB-2000 Sealant.

D. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed or vented piping systems), the following materials are acceptable:
   1. Hilti FS One Intumescent Firestop Sealant.
   2. Hilti CP 642/643 Firestopping Collars
   3. Hilti CP 645 Wrap Strip
   4. Hilti CP 680/681 Cast-In-Place Firestop Devices
   5. 3M Fire Barrier CP25, CP25WB or CP25WB+
   6. 3M Fire Barrier FS-195 Wrap/Strip or PPD Device.

E. For large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways or raceways, the following material is acceptable:
   1. Hilti FS 657 Fireblocks
   2. Hilti CP 637 Trowelable Firestop Compound.
   3. Hilti CP 620 FireFoam
   4. Hilti CP675T Firestop Board
   5. 3M Fire Barrier FB-2001 Foam.
   6. 3M Fire Barrier CS-195 Composite Sheet.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
   1. Verify penetrations are properly sized and in suitable condition for application of materials.
2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may effect proper adhesion.
3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION


B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration firestop materials.
   1. Seal all openings made to accommodate penetrations to ensure an air and water resistant seal.
   2. Consult with mechanical engineer or project manager prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
   3. Protect materials from damage on surfaces subjected to traffic.

C. Manufacturer’s Instructions: Comply with manufacturer’s instructions for installation of fire-rated joint firestop materials.

3.3 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.4 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

(Schedule to Follow)
### 3.5 SCHEDULE OF THROUGH PENETRATION FIRESTOP SYSTEMS

#### CONCRETE FLOORS

<table>
<thead>
<tr>
<th>UL-CLASSIFIED SYSTEMS</th>
<th>CONCRETE OR BLOCK WALLS</th>
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</thead>
<tbody>
<tr>
<td><strong>TYPE OF PENETRANT</strong></td>
<td><strong>F-RATING (HR)</strong></td>
</tr>
<tr>
<td><strong>CIRCULAR BLANK OPENINGS</strong></td>
<td><strong>HILTI 3M</strong></td>
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<tr>
<td>1</td>
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<tr>
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<tr>
<td>3</td>
<td>CAJ 0055, FA 0014</td>
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<tr>
<td><strong>SINGLE METAL PIPES OR CONDUIT</strong></td>
<td><strong>CIRCULAR BLANK OPENINGS</strong></td>
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<td>CAJ 0055, FA 0014</td>
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<td><strong>SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, ENT)</strong></td>
<td><strong>SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, ENT)</strong></td>
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<td><strong>NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS</strong></td>
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<tr>
<td>1</td>
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</tr>
<tr>
<td>3</td>
<td>CAJ 0071, CAJ 0506</td>
</tr>
</tbody>
</table>

*No UL-Classified systems for this manufacturer. Engineer Judgement Drawing Required*

**NOTES:**
1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.
2. If jobsite conditions do not match any UL-classified systems in the schedules above, contact firestop manufacturer for alternative systems or Engineer Judgement Drawings.
3. Where more than one applicable UL-Classified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system.
4. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.
5. For 3-hour rated gypsum walls, contact the firestop manufacturer for a UL-classified system or engineer judgement drawing.
### SCHEDULE OF THROUGH PENETRATION FIRESTOP SYSTEMS (Cont'd.)

#### CONCRETE FLOORS (Cont'd.)

<table>
<thead>
<tr>
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<th>UL-Classified Systems</th>
<th>Type of Penetrant</th>
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<tr>
<td></td>
<td>HILTI 3M</td>
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<td>WOOF Floors</td>
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<td>Insulated Pipes</td>
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**NOTES:**
1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.
2. If jobsite conditions do not match any UL-classified systems in the schedules above, contact firestop manufacturer for alternative systems or Engineer Judgement Drawings.
3. Where more than one applicable UL-Classified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system.
4. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.
5. For 3-hour rated gypsum walls, contact the firestop manufacturer for a UL-classified system or engineer judgement drawing.
### 3.6 SCHEDULE OF UL-2079 (DYNAMIC) JOINT FIRESTOP SYSTEMS

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<th>JOINT TYPE</th>
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<td><strong>EDGE OF CONCRETE FLOOR SLAB-TO-WALL (SEE NOTE 1 FOR CURTAIN WALLS)</strong></td>
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* SEE NOTE 6
** CONTACT MANUFACTURER FOR CURRENT UL-CLASSIFIED SYSTEM OR ENGINEER JUDGEMENT DRAWING

**NOTES:**
1. FOR EDGE OF SLAB JOINTS AT UNRATED CURTAIN WALLS, UTILIZE OMEGA POINT LABORATORIES DRAWING # CEJ-216P, OR CONTACT HILTI FOR AN ENGINEER JUDGEMENT DRAWING (1-800-879-8000.)
2. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
3. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED UL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
4. SYSTEMS MARKED WITH ASTERISK (*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/8 FIREPROOFING.
5. HEAD-OF-WALL SYSTEMS SPECIFIED ONLY FOR 2- OR 3-HR SYSTEMS MAY NOT BE SUITABLE FOR MASONRY WALLS OR GYPSUM WALL ASSEMBLIES WITH LOWER HOURLY RATINGS.

**CONTACT THE FIRESTOP MANUFACTURER FOR CLARIFICATION**

END OF SECTION

Administrative Upgrades at
Adams Hill Elementary School
Northside ISD

07 84 00 - 8
FIRESTOPPING
SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Clean and prepare joint surfaces.
B. Sealant and backing materials.

1.2 RELATED SECTIONS

A. Section 01 35 63 – Sustainable Design.
B. Section 03 30 00 – Cast-In-Place Concrete: Coordinate installation of sealants used in conjunction with concrete.
C. Section 04 22 00 – Unit Masonry Assemblies: Coordinate installation of sealants used in conjunction with masonry.
D. Section 07 52 16 – Modified Bitumen Roof System: Sealants used in conjunction with roofing.
E. Section 07 62 00 – Flashing and Sheet Metal: Coordinate installation of sealants used in conjunction with metal fascias and flashings for roofing and trim.
F. Section 08 41 13 – Aluminum Entrances and Storefronts and perimeter sealants.
G. Section 08 81 00 – Glass and Glazing: Sealants used in conjunction with glazing methods.
H. Section 09 21 16 – Gypsum Board Systems: Sealants used in conjunction with acoustic treatment of partitions.
I. Section 09 30 00 – Tile: Coordinate installation of sealant used in conjunction with tile finishes.

1.3 REFERENCES

C. ASTM C804 - Recommended Practice for Use of Solvent-Release Type Sealants.
D. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
E. FS TT-S-227E(3) - Sealing Compound, Elastomeric Type, Multi-Component.
F. FS TT-S-230A(1) - Sealing Compounds, Synthetic Rubber Base, Single Component, Chemically Curing.
1.4 QUALITY ASSURANCE

A. All products in this section shall meet the VOC content requirements in the applicable category of SCAQMD Rule 1168.

B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 SUBMITTALS

A. Submit product data and samples in accordance with Section 01 33 00. Include VOC data for each product.

B. Submit manufacturer's surface preparation and installation instructions.

C. Submit samples of sealant colors.

D. Review all sealant specified or otherwise indicated in Contract Documents with sealant manufacturer. Verify in writing to Architect prior to ordering any sealant materials that all sealant shown, specified, and otherwise indicated issued appropriately, is compatible with adjacent contact surfaces, and conforms to manufacturers' recommendations for intended use. Report in writing only deviations from manufacturer's recommendation, technical bulletin, quality standard or code.

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 WARRANTY

A. Provide one-year warranty in accordance with Section 01 77 00.

B. Warranty: Replace sealants which fail because of loss of cohesion or adhesion, or did not cure.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

A. Sealant "A": Acrylic base, single component, solvent curing, conforming to FS TT-S-230; capable of being continuously immersed in water, withstand movement of up to 75 percent of joint width and satisfactorily applied throughout a temperature range of 40 to 80 degrees F shore A hardness of maximum 55; non-staining; non-bleeding; non-sagging; color as selected; "Mono" manufactured by Tremco or "Unicrylic 60+" manufactured by Pecora.

B. Sealant "B": Polyurethane base, multi-component, chemical curing; conforming to FS TT-S-227E, Class A, Type II (non-sagging) capable of being continuously immersed in water,
withstand movement of up to 25 percent of joint width and satisfactorily applied throughout a temperature range of 40 to 80 degrees F, uniform, homogeneous, and free from lumps, skins, and coarse particles when mixed; Shore A hardness of minimum 15 and maximum 50, non-staining; non-bleeding; color as selected; "Sonolastic NP II" manufactured by Sonneborn or "Dynatrol II" manufactured by Pecora or "Dymeric" or "THC-901", by Tremco.

C. Sealant "C": Polyurethane base, single component, chemical curing; conforming with FS TT-S-230C, Type II, Class A (non-sagging); capable of being continuously immersed in water, withstand movement of up to 25 percent of joint width and satisfactorily applied throughout a temperature range of 40 to 80 degrees F; Shore A hardness of minimum 15 and maximum 50; non-staining; non-bleeding; color as selected; "Sonolastic NPI" manufactured by Sonneborn, "Dymonic" manufactured by Tremco or "Dynatrol I" manufactured by Pecora.

D. Sealant "D": Acrylic emulsion base, single component, complying with ASTM C834; capable of withstanding movement of up to 7.5 percent of joint width and satisfactorily applied throughout a temperature range of 40 to 80 degrees F; Shore A hardness of maximum 60; non-staining; non-bleeding; non-sagging; color as selected; "Sonolac" manufactured by Sonneborn, or "Acrylic Latex Caulk AC20" manufactured by Pecora, or "Acrylic Latex Caulk" manufactured by Tremco.

E. Sealant "E": Silicone base, single component, mildew resistant, capable of withstanding movement of up to 25 percent of joint width and satisfactorily applied throughout a temperature range of 40 to 80 degrees F; Shore A hardness of maximum 50; non-staining; color as selected by the Architect; Silicone Sanitary 1700 Sealant manufactured by General Electric Co.


G. Hot Vent Sealant: Equal to Sonneborn Omni Seal.

H. Substitutions: In Accordance with Section 01 60 00.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Filler: ASTM D1056; round, closed cell polyethylene foam rod, oversized 30 to 50 percent; "Sonofoam" Backer Rod manufactured by Sonneborn.


E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify joint dimensions, physical and environmental conditions are acceptable to receive work of this Section.
B. Beginning of installation means acceptance.

3.2 PREPARATION
A. Clean, prepare and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.

B. Test all materials to be used on substrates such as insulation behind spandrel glass by applying to samples typical of specified window wall assembly, separately and in combination. Test typical details in locations selected by the Architect.

C. Verify that joint shaping materials and release tapes are compatible with sealant.

D. Examine joint dimensions and size materials to achieve required width/depth ratios.

E. Use joint filler to achieve required joint depths, to allow sealants to perform properly.

F. Use bond breaker where required or where recommended by sealant manufacturer.

3.3 INSTALLATION
A. Perform work in accordance with ASTM C804 for solvent release and C790 for latex base sealants.

B. Install sealant in accordance with manufacturer's instructions.

C. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.

D. Tool joints concave.

E. Joints: Free of air pockets, foreign embedded matter, ridges and sags.

3.4 SCHEDULE
A. Expansion Joints in Exterior Walls: Sealant "B".

B. Control Joints in Masonry: Sealants "B" or "C".

C. Reglets, control joints and other flashing conditions: Sealant "C".

D. Joints between materials on Exterior, as around window frames, door frames; joints between and below coping stones: Sealants "A" or "C".

E. Joints between materials on Interior, such as between masonry and concrete, around door frames: Sealant "D" (indicated on drawings as "caulk").

F. Exterior sealant condition not included above: Sealants "A" or "C".

G. Interior sealant of control joints in ceramic tile: Sealant "E".

H. Interior sealant at window sills, jambs, casework tops/splashes with sinks, around lavatory and toilet fixtures: Sealant "E".

I. Interior sealant at joints larger than 1/16" between casework and walls or other dissimilar material abuttings: Sealant "D".

J. Interior sealant or caulking not included above or in other Section of the Specifications: Sealant "D".

END OF SECTION
SECTION 08 11 13
STANDARD STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Standard and fire rated pressed steel hollow metal door and frames.
B. Steel sidelight, borrowed lite and transom frames.
C. Light frames and glazing installed in hollow metal doors.

1.2 RELATED SECTIONS
A. Section 08 14 16 – Flush Wood Doors.
B. Section 08 71 00 – Finish Hardware.
C. Section 09 91 00 – Painting: Field painting of frames.

1.3 REFERENCE STANDARDS
A. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
E. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
F. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
G. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
J. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
O. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

D. Fire-Rated, Borrowed-Light Frame Assemblies: 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 according to NFPA 257. Provide labeled glazing material.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 SHOP DRAWINGS AND PRODUCT DATA

A. Submit shop drawings and product data in accordance with Section 01 33 00.

B. Indicate general construction, configurations, jointing methods, reinforcements, anchorage methods, hardware locations and installation details.

1.6 DELIVERY, STORAGE AND HANDLING

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

B. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

D. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

E. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.
1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer and Type: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
   1. Ceco Door Products.
   2. Curries Co.
   3. Deansteel Manufacturing Co.

B. Substitutions: Under provisions of Section 01 60 00.

2.2 DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
   1. Design: Flush panel.
   2. Core Construction: Manufacturer's standard core to meet fire rating and thermal rated assembly with a minimum R-value of 2.8 or better.
   3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
   4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel shall include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
   5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
   6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

2.3 FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

C. Interior Frames: 16 gauge thick material, base metal thickness. Galvannealed sheet in accordance with ASTM A653, A60 coating designation.
   1. Types: Welded frames.
   2. Mortar Guard Boxes: Minimum 22 gauge thick; welded in place.
   3. Door Silencers (non-fire rated frames): As specified in Section 08 71 00.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

2.4 LIGHT OPENINGS AND GLAZING

A. Preformed Metal Frames for Light Openings: Manufacturer’s standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.5 ACCESSORIES

A. Removable Stops: Rolled steel, channel shape, butted corners; prepared for countersink style screws.

B. Body Filler: Heavy-duty filler; Bondo Corporation, 3700 Atlanta Industrial Parkway, NW Atlanta, GA 30331

C. Primer: ANSI A250.10 rust inhibitive type.

2.6 FABRICATION

A. General:
   1. Accurately form and cut mitered corners of welded type frames. Weld on inside surfaces. Grind welded joints to smooth uniform finish.
   2. Reinforce frames wider than 4 feet with 12 gage rolled formed steel channels welded in place, flush with top of frames.
   3. Reinforce and prepare frames to receive hardware. Refer to Section 08 71 00 for hardware requirements.
   4. Prepare non-rated frame for silencers where indicated on hardware schedule. Place minimum of 3 single silencer locations on single door frames. Space equally along strike jambs. Place minimum of 2 single silencer locations on double door frames. Place on frame heads.
   5. Provide jamb anchors for hollow metal frames: SDI-100. Weld floor jamb anchors in place.
   6. Fill surface depressions of hollow metal frames with metallic paste filler and grind to smooth finish.
   7. Touch up areas on hollow metal where galvanized coating has been damaged by welding or handling.
   8. Chemically treat surfaces and apply one coat of primer.

B. Steel Doors:
   1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
   2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
   3. Close top of exterior door with metal closure piece. Apply uniform layer of heavy-duty body filler across entire top surface to prohibit water accumulation and to seal joints watertight.
2.7 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
   1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install door frames in accordance with SDI-100 except as amended in this Section.
B. Coordinate with masonry and wallboard wall construction for anchor placement; provide not less than 4 anchors per jamb or upright.
C. Coordinate installation of glass and glazing.
D. Install hollow metal frames plumb and square, in correct locations indicated on drawings. Insure frames are securely and rigidly anchored to adjacent construction.
E. Coordinate installation of frames with installation of hardware specified in Section 08 71 00 and doors in Section 08 14 16.
F. After installation, touch-up scratched or damaged surfaces. Use type of primer identical to that used for shop coat and zinc rich coating on galvanized surfaces.

3.2 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.3 SCHEDULE

A. Refer to Door and Frame Schedule in the Drawings.

END OF SECTION
SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes flush wood doors; flush and flush glazed configuration.

B. Related Sections:
   1. Section 08 11 13 – Standard Steel Doors and Frames
   2. Section 08 71 00 – Door Hardware.
   3. Section 08 81 00 – Glazing.

1.2 REFERENCES

A. ASTM International:
   1. ASTM E413 – Standard Classification for Rating Sound Insulation.

B. Architectural Woodwork Institute:
   1. AWI – Quality Standards Illustrated.

C. Hardwood Plywood and Veneer Association:
   1. HPVA HP-1 – American National Standard for Hardwood and Decorative Plywood.

D. National Fire Protection Association:

E. Underwriters Laboratories Inc.:
   1. UL 10B – Fire Tests of Door Assemblies.
   2. UL – Building Materials Directory.

F. Warnock Hersey:
   1. WH – Certification Listings.

1.3 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures: Submittal procedures.

B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing and louvers.

C. Product Data: Submit information on door core materials and construction, and on veneer species, type and characteristics.

D. Samples:
   1. Submit two samples of door veneer, 8 by 8 inches in size illustrating wood grain, stain color, and sheen.

E. Manufacturer's Installation Instructions: Submit special installation instructions.
1.4 QUALITY ASSURANCE

A. Perform Work in accordance with AWI Quality Standard Section 1300, Premium grades identified in section.

B. Finish doors in accordance with AWI Quality Standard Section 1500, grades identified in section.


D. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Package, deliver and store doors in accordance with AWI Section 1300.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer when stored more than one week.
   1. Break seal on site to permit ventilation.

1.7 COORDINATION

A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with door opening construction, door frame and door hardware installation.

1.8 WARRANTY

A. Section 01 77 00 – Execution Requirements: Product warranties and product bonds.

B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

C. Furnish manufacturer's "Life of Installation" warranty for interior doors.

PART 2 - PRODUCTS

2.1 FLUSH WOOD DOORS

A. Manufacturers:
   1. Algoma Hardwoods Inc.
   2. Buell Door Company.
   3. Eggers Industries.
   4. Marshfield Door systems.
   5. VT Industries.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Solid core flush wood doors; wood veneer facing material; non-rated types; flush and flush glazed design; factory pre-fit; shop finished.
   1. Sound rated wood doors where indicated.
   2. Flush Interior Doors: 1-3/4 inches thick; solid core, five ply construction, non-rated, and acoustic rated as indicated on Drawings.

2.2 COMPONENTS

A. Solid Core, Non-Rated: AWI Section 1300, Type PC5 - Particleboard.
B. Solid Core, Fire Rated: AWI Section 1300, Type as required for fire rating.
C. Solid Core, Special Function: AWI Section 1300, Type SR - Sound Retardant (Acoustical).
E. Facing Adhesive: Type I - waterproof.

2.3 ACCESSORIES

A. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.

2.4 FABRICATION

A. Fabricate non-rated doors in accordance with AWI Quality Standards requirements.
B. Fabricate fire rated doors in accordance with AWI Quality Standards and to UL requirements. Attach fire rating label to door.
C. Stiles shall be minimum 1-1/2 by 1-1/2 inch hardwood stained, bonded to core.
D. Rails shall be minimum 1-1/8 inch, bonded to core.
   1. Sound Retardant Doors at Conference Room and Office: STC 42.
F. Furnish lock blocks at lock edge and top of door for closer for hardware reinforcement.
G. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Furnish solid blocking for through bolted hardware.
H. Factory fit doors for frame opening dimensions identified on shop drawings.
I. Cut and configure exterior door edge to receive recessed weather stripping devices.
J. Provide edge clearances in accordance with AWI 1300.

2.5 SHOP FINISHING

A. Factory finish doors in accordance with AWI Quality Standard Section 1500 to the following finish designations; color as selected:
   1. Transparent Finish TR-6: Catalyzed polyurethane, Custom quality, satin sheen. Seal door top edge with clear sealer to match door facing.
PART 3 - EXECUTION

3.1 EXAMINATION
A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.
B. Verify opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION
A. Install doors in accordance with AWI Quality Standard, NFPA 80, and to requirements for fire rating label by UL or Warnock Hersey.
B. Trim non-rated door width by cutting equally on both jamb edges.
C. Trim door height by cutting bottom edges to maximum of 3/4 inch.
   1. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
D. Machine cut doors for hardware installation.
E. Coordinate installation of doors with installation of frames specified in Section 08 12 00 and hardware specified in Section 08 71 00.
F. Coordinate installation of glass and glazing specified in Section 08 81 00.

3.3 INSTALLATION TOLERANCES
A. Section 01 40 00 - Quality Requirements: Tolerances.
B. Conform to AWI requirements for fit and clearance tolerances.
C. Conform to AWI Section 1300 requirements for maximum diagonal distortion.

3.4 ADJUSTING
A. Section 01 77 00 - Execution Requirements: Testing, adjusting, and balancing.
B. Adjust door for smooth and balanced door movement.
C. Adjust closer for full closure in compliance with TAS Guidelines.

3.5 SCHEDULE
A. Refer to Door and Frame Schedule on Drawings.

END OF SECTION
SECTION 08 31 13
ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes non-rated access doors and panels with frames.
   1. Provide for access to controls, valves, traps, dampers, cleanouts, and similar items requiring operation behind inaccessible finished surfaces.
   2. Coordinate exact locations with various trades in Division 22, 23, and 26 to assure proper placement of access doors and panels.

B. Related Sections:
   1. Section 03 10 00 – Concrete Forms and Accessories: Placement of access frame unit anchors in concrete.
   2. Section 04 20 00 – Unit Masonry Assemblies.
   3. Section 08 33 00 – Rolling Counter Fire Shutters
   4. Section 09 22 16 – Non-Structural Metal Framing.
   5. Section 09 21 16 – Gypsum Board Systems.
   7. Section 09 91 00 – Painting: Field paint finish.
   8. Section 23 33 00 – Duct Accessories: Access doors in ductwork.

1.2 REFERENCES


C. Warnock Hersey: WH - Certification Listings.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate exact position of access door units.

C. Product Data: Submit literature indicating sizes, types, finishes, hardware, scheduled locations, fire resistance listings, and details of adjoining Work.

D. Manufacturer's Installation Instructions: Submit installation requirements and rough-in dimensions.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Execution Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of access units.
1.5 QUALITY ASSURANCE

A. Fire Resistance Ratings: Where indicated as fire rated, provide assemblies from manufacturers listed in UL Directory or Warnock Hersey Directory.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified with minimum three years documented experience.

1.7 COORDINATION

A. Coordinate Work under provisions of Section 01 26 00 – Contract Coordination.

B. Coordinate Work with work requiring controls, valves, traps, dampers, cleanouts, and similar items requiring operation being located behind finished surfaces.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND PANELS

A. Manufacturers:
   1. Bilco, Inc.
   2. J. L. Industries.
   4. Nystrom Products Co.
   5. Milcor LTD, Partnership.
   6. Substitutions: Section 01 60 00 - Product Requirements.

B. Non-Rated Flush Access Doors:
   1. Door: 14-gauge cold rolled sheet steel.
      a. Provide 1 inch flange (NT) at all surfaces except gypsum wallboard.
      b. Provide 22-gauge galvanized drywall bead at perimeter (NW) at gypsum wallboard surfaces.
   3. Size: 10 by 10 minimum size, except where otherwise indicated.
      a. Provide 24 by 24 inch minimum size where full access is required.
   4. Hinge: Concealed pin type, spring loaded to allow for door removal, set to open 175 degrees.
   5. Latching/Locking Device:
      a. Screwdriver cam latch at all doors except toilet rooms.
      b. Key operated cylinder lock at toilet room access doors.
      c. (2) keys per lock.
      d. Key lock with cylinder to match cylinders specified in Section 08 71 00.
   6. Finish: Phosphate dipped with factory applied prime coat except as otherwise noted.
      Paint in accordance with Section 09 91 00.
      a. Stainless steel, No. 4 finish at toilet room access doors.
   7. Model: N Series as manufactured by Nystrom, or approved equal.

C. Floor Access Doors:
   1. Manufacturers:
      a. Babcock Davis: BFDNPA
      b. Bilco, Inc: Type J-3AL.
      c. Nystrom: FDNPA
      d. Substitutions: In accordance with Section 01 60 00.
2. Construction:
   b. Size: 30 by 36 inches.
   c. Door Leaves: 1/4 inch aluminum diamond pattern plate to withstand 300 lbs./sq. ft. live load.
   d. Frame: Extruded aluminum channel frame with bent down anchor tabs around perimeter.
   e. Hardware: Heavy forged aluminum hinges with Type 316 stainless steel pins, spring operators for easy operation, automatic hold-open arms with release handles. Provide snap locks with removable handles. Provide engineered composite compression spring tubes; steel compression springs with electrocoated acrylic finish. All other components of door shall be aluminum or Type 316 stainless steel.

3. Accessories:

2.2 FABRICATION

A. Fabricate units of continuous welded construction; weld, fill, and grind joints to assure flush and square unit.

B. Wall and Ceiling Access Door and Panel Hardware:
   1. Hinge: Standard continuous or concealed spring pin type, 175 degree steel hinges.
   2. Lock: Self-latching lock. Screw driver slot for quarter turn cam lock Removable wrench lift handle.

C. Size Variations: Obtain acceptance of manufacturer’s standard size units which vary slightly from sizes shown or scheduled.

2.3 SHOP FINISHING

A. Base Metal Protection: Bituminous coating applied to the exterior of frame.

B. Aluminum: Mill finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify rough openings for access doors and panels are correctly sized and located.

3.2 INSTALLATION

A. Secure frames rigidly in place, plumb and level in opening, with plane of door and panel face aligned with adjacent finished surfaces.
   Set concealed frame type units flush with adjacent finished surfaces.

B. Position unit to provide convenient access to concealed work requiring access.

END OF SECTION
SECTION 08 33 00
ROLLING COUNTER FIRE SHUTTERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Manual operated automatic closing rolling counter fire doors with UL leakage rated assembly label.

B. Related Sections:
   1. Section 04 20 00 – Unit Masonry Assemblies; Window opening jamb and head members.
   2. Section 06 41 00 - Custom Casework; Coordination with fire rated countertop.
   4. Section 09 22 16 - Non-Structural Metal Framing.
   5. Section 09 51 10 - Suspended Acoustical Ceilings
   6. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.

C. Products That May Be Supplied, But Are Not Installed Under This Section:
   1. Primary and control wiring
   2. Conduit and fittings

1.2 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Provide doors with Underwriters’ Laboratories, Inc. label for the fire rating classification, 1 1/2 hr.
   2. Provide doors with Underwriters’ Laboratories, Inc. label for “Leakage Rated Assembly” or “S” label demonstrating product tested to UL 1784.
      a. Comply with NFPA 105 air leakage requirements

1.3 SUBMITTALS

A. Reference Section 01 33 00 Submittal Procedures; submit the following items:
   1. Product Data
   2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
   3. Quality Assurance/Control Submittals:
      a. Provide proof of manufacturer ISO 9001:2015 registration
      b. Provide proof of manufacturer and installer qualifications - see 1.4 below
      c. Provide manufacturer’s installation instructions
   4. Closeout Submittals:
      a. Operation and Maintenance Manual
      b. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer Qualifications: ISO 9001:2015 registered and a minimum of five years experience in producing counter fire doors and smoke control units of the type specified
2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING
A. Reference Section 01 66 00 - Product Storage and Handling Requirements.
B. Follow manufacturer's instructions.

1.6 WARRANTY
A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.
B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 - PRODUCTS
2.1 MANUFACTURER
A. Manufacturer:
1. Cornell: 24 Elmwood Avenue Mountain Top, PA 18707; (800) 233-8366.
2. Cookson
3. Clopay Building Products
4. Amarr
B. Substitutions: Under provisions of Section 01 60 00.

2.2 MATERIALS
A. Curtain:
1. Slat Configuration: Galvanized Steel; No. 1F, interlocked flat-faced slats, 1-1/2 inches high by 1/2 inch deep, minimum 22 gauge ASTM A 653, Commercial Quality, galvanized steel with plain steel bottom bar and vinyl astragal
2. Finish: GalvaNex™ Coating System (Stock Colors): ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and baked-on polyester enamel finish coat; color as selected by Architect.
B. Endlocks: Fabricate continuous interlocking slat sections with high strength galvanized steel endlocks riveted to slats per UL requirements
C. Guides: Steel: minimum 12 gauge formed shapes.
1. Finish: Powder Coat: Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better.
D. Counterbalance Shaft Assembly:
1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.

E. Brackets: Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
   1. Finish: Powder Coat (Stock Colors): Zirconium treatment followed by a baked-on polyester powder coat; color as selected by Architect; minimum 2.5 mils cured film thickness

F. Hood and Mechanism Covers: 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets as required to prevent excessive sag.
   1. Finish: GalvaNex™ Coating System (Stock Colors): ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and gray baked-on polyester finish coat

G. Smoke Seals & UL Smoke Label:
   1. Bottom Bar: UL tested brush seal.
   2. Guides and Head: Replaceable, UL Listed, brush seals sealing against fascia side of curtain

2.3 OPERATION

A. Manual Operation:
   1. AlarmGard Advanced Manual Crank Fire Door Operators: Electrically activated, manually operated, 115 volt AC system with planetary gear reduction, a transformer with 24v secondary output and an internal failsafe release mechanism
      a. Door assembly to be manually operated by crank.
      b. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.
      c. Electrically activate automatic closure by notification from central alarm system or power outage.
      d. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
      e. Delay automatic closure after notification for no more than ten seconds
      f. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices
      g. Maintain automatic closure speed at an average of 12” (304mm) per second
      h. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human supervision
      i. Provide minimum #50 roller chain from operator output shaft to the door drive shaft
      j. Install system only with manufacturer supplied or specified fasteners
      k. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required
      l. Notify electrical contractor to supply and install the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions
      m. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5

2.4 ACCESSORIES

A. A. Locking: None.
B. Removable Hand Crank.

C. UL Labeled and Listed Countertop to Meet NFPA 80 Requirements:
   1. Plastic laminate covered: 1 ½ Hour UL Labeled, 1-5/8” thick, plastic laminate covered, size and configuration made to coordinate opening size with integral millwork. Color as selected by Architect from standard range of Wilson Art or Formica plastic laminates.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
   B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
   C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION
   A. Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports
   B. Comply with NFPA 80 and NFPA 105 and follow manufacturer's installation instructions

3.3 ADJUSTING
   A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 FIELD QUALITY CONTROL
   A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form

3.5 CLEANING
   A. Clean surfaces soiled by work as recommended by manufacturer
   B. Remove surplus materials and debris from the site

3.6 DEMONSTRATION
   A. Demonstrate proper operation to Owner's Representative
   B. Instruct Owner's Representative in maintenance procedures

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents: Conditions of the Contract, Division 1 - General Requirements, and Drawings apply to Work of this Section.

B. Section Includes:
   1. Exterior window storefront systems, complete with reinforcing, fasteners, anchors, and attachment devices.
   2. Accessories necessary to complete work.

C. Products Furnished But Not Installed Under This Section:
   1. Anchoring devices which are built into masonry.
   2. Anchoring devices which are cast in concrete.

D. Related Sections:
   1. Section 05 50 00 – Metal Fabrications.
   2. Section 06 10 00 – Rough Carpentry.
   3. Section 07 65 00 – Thru-Wall Flexible Flashing And Drainage System.
   4. Section 07 92 00 – Joint Sealers.
   5. Section 08 71 00 – Door Hardware.
   6. Section 08 81 00 – Glass and Glazing.

1.2 REFERENCES

A. Aluminum Association (AA):
   1. DAF-45 Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association (AAMA):
   1. 501.2 Field Check of Metal Curtain Walls for Water Leakage.
   2. 607.1 Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
   3. 701.2 Specifications for Pile Weatherstripping.
   4. SFM-1 Aluminum Storefront and Entrance Manual.

C. American National Standards Institute (ANSI):
   1. A117.1 Safety Standards for the Handicapped.

D. ASTM International:
   1. ASTM A36 - Structural Steel.
   3. ASTM B209 - Aluminum and Aluminum - Alloy Sheet and Plate.
   5. ASTM B308 - Aluminum-Alloy 6061-T6 Standard Structural Shapes, Rolled or Extruded.

E. Federal Specifications (FS):
   1. TT-P-641G(1) Primer Coating, Zinc Dust-Zinc Oxide (For Galvanized Surfaces).
1.3 SYSTEM REQUIREMENTS

A. Design Requirements:
1. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage, or moisture disposal.
2. Requirements shown by details are intended to establish basic dimension of units, sight lines and profiles of members.
3. Provide concealed fastening.
4. Provide storefront systems, including necessary modifications, to meet specified requirements and maintaining visual design concepts.
5. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
6. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
7. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.

B. Performance Requirements:
1. Air infiltration: Air leakage through fixed light areas of storefront shall not exceed 0.02 cfm per square foot of surface area when tested in accordance with ASTM E283 at differential static pressure of 6.24 psf.
2. Water infiltration: No uncontrolled leakage when tested in accordance with ASTM E331 at test pressure of 10 psf.

C. Thermal Requirements:
1. Framing systems shall accommodate expansion and contraction movement due to surface temperature differentials of 180 degrees F without causing buckling, stress on glass, failure of joint seals, excessive stress on structural elements, reduction of performance, or other detrimental effects.
2. Ensure doors function normally within limits of specified temperature range.

D. Structural Requirements, as measured in accordance with ANSI/ASTM E330:
1. Basic Wind loads for exterior assemblies:
   a. 20 lb/sq ft acting inward.
   b. 20 lb/sq ft acting outward.
2. Deflection: Maximum calculated deflection of any framing member in direction normal to plane of wall when subjected to specified design pressures for spans up to and including 13 feet 6 inches shall be limited to 1/175 of its clear span and for spans greater than 13 feet 6 inches deflection shall be limited to 1/240 + 1/4 inch of its clear span, except that maximum deflection of members supporting plaster surfaces shall not exceed 1/360 of its span.

E. Testing Requirements: Provide components that have been previously tested by an independent testing laboratory.

1.4 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00.

B. Product Data:
1. Submit manufacturer’s descriptive literature and product specifications.
2. Include information for factory finishes, hardware, accessories, and other required components.

C. Shop Drawings:
1. Submit shop drawings covering fabrication, installation and finish of specified systems. Include following:
   a. Fully dimensioned plans and elevations with detail coordination keys.
   b. Locations of exposed fasteners and joints.
2. Provide detailed drawings of:
   a. Composite members.
   b. Joint connections for framing systems and for entrance doors.
   c. Anchorage.
   d. System reinforcements.
   e. System expansion and contraction provisions.
   f. Glazing methods and accessories.
   g. Internal sealant requirements.
   h. Thermal improvements.

D. Samples:
1. Submit manufacturer’s standard samples indicating quality of finish.
2. Submit samples 2 by 3 inches indicating actual aluminum finish.
3. Where normal texture or color variations are expected, include additional samples illustrating range of variation.

E. Test Reports: Submit certified copies of previous test reports substantiating performance of system in lieu of retesting. Include other supportive data as necessary.

F. Qualification Data: Submit installer qualifications verifying years of experience.

G. Manufacturer’s Instructions: Submit manufacturer’s printed installation instructions.

1.5 QUALITY ASSURANCE
A. Single Source Responsibility: Obtain materials for systems from either a single manufacturer or from manufacturer approved by systems manufacturer.

B. Installer Qualifications: Certified in writing by system manufacturer as qualified for installation of specified systems.

C. Perform Work in accordance with AAMA SFM-1 and manufacturer’s written instructions.

D. Conform to requirements of ANSI A117.1 and TAS.

E. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

F. Mock-Ups (Field Constructed): Install at project site, in conjunction with the building envelope mock up, a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, and workmanship standard.
   2. Indicate all components necessary to install work, including but not limited to, perimeter angles, backplates sill receptors, etc.
3. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

4. Incorporation: Mock-up may not be incorporated into final construction upon Owner's approval.

G. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.6 PROJECT CONDITIONS / SITE CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of Section 01 60 00.
B. Protect finished surfaces as necessary to prevent damage.
C. Do not use adhesive papers or sprayed coatings which become firmly bonded when exposed to sun.
D. Do not leave coating residue on any surfaces.
E. Replace damaged units.

1.8 WARRANTY

A. Provide warranties in accordance with Section 01 77 00.
B. Provide written warranty in form acceptable to Owner jointly signed by manufacturer, installer and Contractor warranting work to be watertight, free from defective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within 1 year from date of Substantial Completion.
C. Warranty shall cover following:
   1. Complete watertight and airtight system installation within specified tolerances.
   2. System is structurally sound and free from distortion.

PART 2 - PRODUCTS

2.1 EXTERIOR STOREFRONT FRAMING SYSTEM AND PRODUCTS

A. Storefront Framing System: 1" glass thickness, flush glazed; head and sill members continuous, thermally broken, 2" x 4-1/2" mullion profile. Center set, exterior flush glazed; jambs and vertical mullions shall be continuous. Head, sill, and intermediate horizontal members are attached by screw spline joinery or shear block attachment. Subject to compliance with requirements indicated, provide products by one of the following:
   1. YKK AP Series YES 45 TU Storefront System for Insulated Glazing (Basis of Design).
   2. Kawneer Company Inc.
   3. Tubelite, Inc.
   4. United States Aluminum
   5. Substitutions: Submit under provisions of Section 01 60 00.
B. Window Sill: Two-piece aluminum 0.050 inch thick; as indicated on Drawings. Match framing finish.

C. Components: Manufacturer's standard extruded aluminum expansion mullions, framing, sills, backplates, anchoring angles and indicated shapes.

2.2 FRAMING MATERIALS AND ACCESSORIES

A. Extrusions: ASTM B221, 6063-T5 Aluminum Alloy.

B. Aluminum Sheet:
   1. Anodized Finish: ASTM B 209 (ASTM B 209M), 5005-H14 Aluminum Alloy, 0.050 inch minimum thickness.

C. Internal Reinforcing:
   1. ASTM A36 for carbon steel; or ASTM B308 for structural aluminum.
   2. Shapes and sizes to suit installation.
   3. Steel components factory coated with alkyd type zinc chromate primer complying with FS TT-P-645.

D. Anchorage Devices:
   1. Manufacturer's standard formed or fabricated steel or aluminum assemblies of shapes, plates, bars or tubes.
   2. Hot-dip galvanize steel assemblies after fabrication, comply with ASTM A123, 2.0 ounce minimum coating.

E. Fasteners:
   1. Aluminum, non-magnetic stainless steel or other non-corrosive materials compatible with items being fastened.
   2. Provide concealed fasteners wherever possible.
   3. For exposed locations, provide Phillips flathead screws with finish matching item fastened.
   4. For concealed locations, provide manufacturer's standard fasteners.

F. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.

G. Protective Coatings: Cold-applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.

H. Touch-Up Primer for Galvanized Components: Zinc oxide conforming with FS TT-P-641.

I. Glazing Gaskets:
   1. Compression type design, replaceable, molded or extruded, of neoprene, polyvinyl chloride (PVC), or ethylene propylene diene monomer (EPDM).
   2. Profile and hardness as required to maintain uniform pressure for watertight seal.

J. Weatherstripping:
   1. Wool pile conforming to AAMA 701.2.
   2. Provide EPDM or vinyl-blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.

K. Internal Sealants and Baffles.

2.3 GLASS AND GLAZING ACCESSORIES

A. Refer to Section 08 81 00.
2.4 FABRICATION

A. Coordination of Fabrication:
   1. Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
   2. Fabricate units to withstand loads which will be applied when system is in place.

B. General
   1. Conceal fasteners wherever possible.
   2. Reinforce work as necessary for performance requirements, and for support to structure.
   3. Separate dissimilar metals and aluminum in contact with concrete utilizing protective coating or preformed separators which will prevent contact and corrosion.
   4. Comply with Section 08 81 00 for glazing requirements.

C. Aluminum Framing:
   1. Provide members of size, shape and profile indicated, designed to provide for glazing from exterior or interior.
   2. Provide manufacturer's standard thermal break between exterior and interior aluminum surfaces.
   3. Fabricate frame assemblies with joints straight and tight fitting.
   4. Reinforce internally with structural members as necessary to support design loads.
   5. Maintain accurate relation of planes and angles, with hairline fit of contacting members.
   6. Seal horizontals and direct moisture accumulation to exterior.
   7. Provide flashings and other materials used internally or externally that are corrosive resistant, non-staining, non-bleeding and compatible with adjoining materials.
   8. Provide manufacturer's extrusions and accessories to accommodate expansion and contraction due to temperature changes without detrimental to appearance or performance.
   9. Make provisions in framing for minimum edge clearance, nominal edge cover and nominal pocket width for thickness and type of glazing or infill used in accordance with recommendations of manufacturer and FGMA Glazing Manual.

D. Welding:
   2. Use recommended electrodes and methods to avoid distortion and discoloration.
   3. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.

E. Flashings: Form from sheet aluminum with same finish as extruded sections. Apply finish after fabrication. Material thickness as required to suit condition without deflection or "oil canning".

2.5 FINISHES

A. Anodized Finish: Duranodic Bronze to match existing aluminum finish, with clear protective composite coating.

B. Anodized Finishing: Prepare aluminum surfaces for specified finish; apply shop finish in accordance with the following:
   1. Anodic Coating: Electrolytic color coating followed by an organic seal applied in accordance with the requirements of AAMA 612-02. Aluminum extrusions shall be produced from quality controlled billets meeting AA-6063-T5.
      a. Exposed surfaces shall be free of scratches and other serious blemishes.
extrusions shall be given a caustic etch followed by an anodic oxide treatment and then sealed with an organic coating applied with an electrodeposition process.

c. the anodized coating shall comply with all of the requirements of AAMA 612-02: Voluntary Specifications, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum. Testing shall demonstrate the ability of the finish to resist damage from mortar, salt spray, and chemicals commonly found on construction sites, and to resist the loss of color and gloss.

d. overall coating thickness for finishes shall be a minimum of 0.7 mils.

e. CASS Corrosion Resistance Test, CASS 240/ASTM B368 Test Method. Other AAMA 2605 Performance Tests specified in these specifications, such as: 7.3 Dry Film Hardness; 7.8.2 Salt Spray Resistance; 7.9.1.2 Color Retention, South Florida; 7.9.1.4 Gloss Retention, South Florida.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions and proceed with Work in accordance with Section 01 40 00.

3.2 INSTALLATION

A. Erection Tolerances:
   1. Limit variations from plumb and level:
      a. 1/8 inch in 10 feet vertically.
      b. 1/8 inch in 20 feet horizontally.
   2. Limit variations from theoretical locations: 1/4 inch for any member at any location.
   3. Limit offsets in theoretical end-to-end and edge-to-edge alignment: 1/16 inch from flush surfaces not more than 2 inches apart or out-of-flush by more than 1/4 inch.

B. Set units plumb, level and true to line, without warp or rack of frame.

C. Anchor securely in place, allowing for required movement, including expansion and contraction.

D. Separate dissimilar materials at contact points, including metal in contact with masonry or concrete surfaces, with bituminous paint or preformed separators to prevent contact and corrosion.

E. Set sill members in bed of sealant. Set other members with internal sealants and baffles to provide weathertight construction.

F. Coordinate installation of perimeter sealant and backing materials between assemblies and adjacent construction in accordance with requirements of Section 07 92 00.

G. Glazing: Refer to requirements of Section 08 81 00.
3.3 ADJUSTING

A. Test door operating functions. Adjust closing and latching speeds and other hardware in accordance with manufacturer’s instructions to ensure smooth operation.

3.4 CLEANING

A. Clean surfaces in compliance with manufacturer’s recommendations; remove excess mastic, mastic smears, foreign materials and other unsightly marks.

B. Clean metal surfaces exercising care to avoid damage.

END OF SECTION
PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Work under this section comprises of furnishing hardware specified herein and noted on drawings for a complete and operational system, including any electrified hardware components, systems, controls and hardware for aluminum entrance doors. Any door shown on the drawing and not specifically referenced in the hardware sets shall be provided with identical hardware as specified on other similar openings and shall be included in the General Contractor’s base bid. All fire rated door shall be provided with fire rated hardware as required by local code Authority as part of the General Contractor’s base bid. The hardware supplier shall verify all cylinder types specified for locking devices supplied as part of the door system with the door manufacturer and/or door supplies.

B. The General Contractor shall notify the Architect in writing of any discrepancies (five (5) days prior to bid date) that could and/or would result in hardware being supplied that is none functional, hardware specified and/or hardware that has not been specified that will result in any code violations and any door that is not covered in this specification. Failure of the General Contractor to address any such issue could be considered acceptance of the hardware specified and any and all discrepancies could be corrected at the General Contractor’s expense.

C. Items include but are not limited to the following:

1. Hinges - Pivots
2. Flush Bolts
3. Exit Devices
4. Locksets and Cylinders
5. Push Plates - Pulls
6. Coordinators
7. Closers
8. Kick, Mop and Protection Plates
9. Stops, Wall Bumpers, Overhead Controls
10. Electrified Hold Open Devices
11. Thresholds, Seals and Door Bottoms
12. Silencers
13. Miscellaneous Trim and Accessories

1.02 RELATED DOCUMENTS, drawings and general provisions of contract, including General and Supplementary Conditions, and Division 1 Specification sections, apply to this section.

1.03 RELATED WORK specified elsewhere that should be examined for its effect upon this section:

A. Section 06 20 00 - Finish Carpentry
B. Section 08 11 13 – Standard Steel Doors and Frames
C. Section 08 14 16 – Flush Wood Doors
D. Section 08 41 13 – Aluminum Storefronts
E. Section 08 81 00 – Glass and Glazing
F. Section 09 91 00 - Painting
G. Division 26 – Electrical
H. Division 28 – Access Control
1.04 REFERENCES SPECIFIED in this section subject to compliance as directed:

A. NFPA-80 - Standard for Fire Doors and Windows
C. ADA - The Americans with Disabilities Act - Title III - Public Accommodations
E. ANSI-A 156.5 - American National Standards institute -Auxiliary Locks and Associated Products
F. UFAS - Uniform Federal Accessibility Standards
G. UL - Underwriter’s Laboratories
H. WHI - Warnock Hersey International, Testing Services
I. State and Local Codes including Authority Having Jurisdiction
J. UL10C – Positive Pressure
L. NFPA-70 – International Electrical Code

1.05 SUBMITTALS

A. HARDWARE SCHEDULES submit copies of schedule in accordance with Division 1, General Requirements. Schedule to be in vertical format, listing each door opening, including: handing of opening, all hardware scheduled for opening or otherwise required to allow for proper function of door opening as intended, and finish of hardware. At doors with door closers or door controls include degree of door opening. Supply the schedules all Finish Hardware within two (2) weeks from date purchase order is received by the hardware supplier.

B. Submit manufacturer’s cut/catalog sheets on all hardware items and any required special mounting instructions with the hardware schedule.

C. Certification of Compliance:

1. Submit any information necessary to indicate compliance to all of these specifications as required.
2. Submit a statement from the manufacturer that electronic hardware and systems being supplied comply with the operational descriptions exactly as specified.

D. Submit any samples necessary as required by the Architect.

E. Templates for finish hardware items to be sent to related door and frame suppliers within three (3) working days of receipt of approved hardware schedule.

F. Doors and Frames used in positive pressure opening assemblies shall meet UL10C in areas where this specification includes Seals for smoke door.

1.06 QUALITY ASSURANCE

A. Hardware supplier to be a qualified, Factory Authorized, direct distributor of the products to be furnished. In addition, the supplier to have in their regular employment an AHC or AHC /CDC and/or a person of equivalent experience (minimum fifteen (15) years in the industry) who will be made available at reasonable times to consult with the Architect/Contractor and/or the Northside ISD Representative regarding any matters affecting the finish hardware on this project.

B. All hardware used in labeled fire or smoke rated openings to be listed for those types of openings and bear the identifying label or mark indicating UL. (Underwriter’s Laboratories) approved for fire. Exit devices in non-labeled openings to be listed for panic.
1.07 DELIVERY, HANDLING AND PACKAGING

A. Furnish all hardware with each unit clearly marked and numbered in accordance with the hardware schedule. Include door and item number for each.

B. Pack each item of hardware completes with all necessary parts and fasteners.

C. Properly wrap and cushion each item to prevent scratches and dents during delivery and storage.

1.08 SEQUENCING AND SCHEDULING

Any part of the finish hardware required by the frame or door manufacturers or other suppliers that is needed in order to produce doors or frames is to be sent to those suppliers in a timely manner, so as not to interrupt job progress.

1.09 WARRANTY

All finish hardware shall be supplied with a one- (1) year warranty against defects in materials and workmanship, commencing with substantial completion of the project except as follows:

1. All Closers are to have a thirty- (30) year written warranty.
2. All Exit Devices are to have a five- (5) year written warranty.
3. All Locksets are to have a ten- (10) year written warranty.
4. All Continuous Hinges are to have a ten- (10) year written warranty.

PART 2 – PRODUCTS

2.01 FASTENERS

A. Furnish with finish hardware all necessary screws, bolts and other fasteners of suitable size and type to anchor the hardware in position for a long life under hard use.

B. Furnish fastenings where necessary with expansion shields, toggle bolts and other anchors designated by the Architect according to the material to which the hardware is to be applied and the recommendations of the hardware manufacturer. All closers and exit devices on labeled wood doors shall be through-bolted if required by the door manufacturer. All thresholds shall be fastened with wood screws and plastic anchors. Where specified in the hardware sets, security type fasteners of the type called for are to be supplied.

C. Design of all fastenings shall harmonize with the hardware as to material and finish.

D. All hardware shall be installed with the Manufacturers standard screws as provided. The use of any other type of fasteners shall not be permitted. The general contractor shall provide wood blocking in all stud walls specified and/or scheduled to receive wall stops, No Exception.

2.02 ENVIRONMENTAL CONCERN FOR PACKAGING

The hardware shall ship to the job site is to be packaged in biodegradable packs such as paper or cardboard boxes and wrapping.

2.03 HINGES

A. All hinges to be of one manufacturer as hereafter listed for continuity and consideration of warranty. Provide one of the following manufacturers Ives, Hager, McKinney or Stanley.
B. Unless otherwise specified provide five-knuckle, heavy-duty, button tip, full mortise template type hinges with non-rising loose pins. Provide non-removable pins for out swinging doors at secured areas or as called for in this specification (Refer to 3.02 Hardware Sets).

C. Provide all out-swinging doors with non-removable pins or security studs as called for in 3.02 Hardware Sets. Furnish three (3) hinges up to 90 inches high and one (1) additional hinge for every 30 inches or fraction thereof.

D. Furnish three (3) hinges up to 90 inches high and one (1) additional hinge for every 30 inches or fraction thereof.

E. Provide size 4½” x 4½” for all 1¾” thick doors up to and including 36 inches wide. Doors over 1¾” through 2¼” thick, use 5” x 5” hinges. Doors over 36 inches use 5” x 4½” unless otherwise noted in 3.02 Hardware Sets.

F. Were required to clear the trim and/or to permit the doors to swing 180 degrees furnish hinges of sufficient throw.

G. Provide heavy weight hinges on all doors over 36 inches in width.

H. At labeled door’s steel or stainless steel, bearing-type hinges shall be provided. For all doors equipped with closers provide bearing-type hinges.

2.04 LOCK AND LOCK TRIM

A. All of the locksets, latch sets, and trim to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty. Locksets specified are Best “93k” series with the #15D lever and shall be provided as specified (NO SUBSTITUTION).

B. Provide metal wrought box strike boxes and curved lip strikes with proper lip length to protect trim of the frame, but not to project more than 1/8 inch beyond frame trim or the inactive leaf of a pair of doors.

C. Mechanical Locks shall meet ANSI Operational Grade 1, Series 4000 as specified.
   1. Hand of lock is to be field reversible or non-handed.
   2. All lever trim is to be through-bolted through the door.
   3. Provide a 3 ¾” back set on all doors specified with sound seals.
   4. Provide a ¼” latch bolt throw on all pairs of doors.

2.05 CYLINDERS AND KEYING

A. Provide all exterior and interior locks or Exit Devices requiring cylinders keyed to the Existing Best Small Format Interchangeable Core Master Key System as instructed by Northside ISD Representative. Cylinders shall comply with performance requirements of ANSI A156.5. All keys shall be of nickel silver material only. The Hardware Supplier shall include the cost of all permanent cores as directed by Northside ISD Representative.

B. Cylinders shall be factory keyed and factory maintained as directed by the Northside ISD Representative and the Architect. Provide three- (3) keys per cylinder and six- (6) master keys per master used.

C. Factory stamp all keys “Do not duplicate” and with key symbol as directed by the Northside ISD Representative. Visual key control shall be provided on all permanent keys and cylinders.
2.06 EXIT DEVICES

A. All exit devices and trim, including electrified items, to be of one manufacturer as hereafter listed and in the hardware sets for continuity of design and consideration of warranty; electrified devices and trim to be the same series and design as mechanical devices and trim.

B. Exit Devices to be “UL” listed for life safety. All exit devices for labeled doors shall have “UL” label for “Fire Exit Hardware”. All devices mounted on labeled wood doors are to be through-bolted or per the manufacturer’s listing requirements. All devices shall conform to NFPA 80 and NFPA 101 requirements.

C. All exit devices to be of a heavy duty, chassis mounted design, with a one-piece removable covers, eliminating necessity of removing the device from the door for standard maintenance and keying requirements.

D. All trims to be through-bolted to the lock stile case. Lever design to be the same as specified with the lock sets.

E. Exit Devices shall be the modern push rail design. All exit devices shall be mounted with sex bolts and installed with the manufactures standard screws. Exit Hardware Devices found to be installed with self-drilling and self-tapping screws shall be removed and reinstalled at the installer expenses.

F. All devices shall carry a five- (5) year warranty against manufacturing defects and workmanship.

G. Furnish roller strikes for all rim and surface vertical rod exit devices. Internal springs shall be coil compression type. Furnish security dead latching for all active latch bolts.

H. Exit Devices shall be the Von Duprin “99” series as specified or acceptable products approved by NISD.

2.07 SURFACE MOUNTED DOOR CLOSERS

A. All closers for this project shall be the products of a single manufacturer for continuity of design and consideration of warranty. All door closers shall be mounted as to achieve the maximum degree of opening (trim permitting).

B. All closers to be heavy duty, surface-mounted, fully hydraulic, rack and pinion action with high strength aluminum cylinder to provide control throughout the entire door opening and closing cycle.

C. Size all closers in accordance with the manufacturer’s recommendations at the factory.

D. All closers to have adjustable spring power sizes 1 or 2 through 4 or 6 and non-critical regulating screw valves for closing speed, latching speed and back-check control as a standard feature unless specified otherwise.

E. Provide closer covers only if provided as a standard part of the door closer package.

F. The hardware supplier shall provide any and all required brackets, spacers or filler plates as required by the manufacture for a proper and functional installation as part of their base bid.

G. Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where required otherwise in the hardware sets.
H. Provide drop plates and any additional mounting brackets required for the proper installation of the door closer shall be included in the hardware supplier’s base bid.

I. Finish: Baked on Powder Coated finish (698) shall match other hardware.

J. Provide and mount all door closers with sex bolts as provided by the manufacturer.

K. Closers shall be LCN 4040XP & 1461 FC series or acceptable products manufactured by Stanley or Norton.

2.08 DOOR STOPS AND HOLDERS

A. Door stops are to be furnished for every door leaf. Every door is to have a floor, wall, or an overhead stop.

B. Place doorstops in such a position that they permit maximum door swing, but do not present a hazard of obstruction. Furnish floor strikes for floor holders of proper height to engage holders of doors.

C. Where overhead stops and holders are specified, or otherwise required for proper door operation, they are to be heavy duty and of extruded brass, bronze or stainless steel with no plastic parts as specified. The General Contractor shall provide wood blocking in all stud walls specified and scheduled to receive wall stops.

D. Finish: Shall match other hardware where available.

E. Acceptable Products

   1. Floor and wall stops as listed in hardware sets. Equivalent products as manufactured by Ives, ABH, Rockwood and Trimco are acceptable.

2.09 PUSH PLATES, DOOR PULLS, AND KICKPLATES

A. All push plates, door pull, kick plates and other miscellaneous hardware as listed in hardware sets. Equivalent products as manufactured by Ives, Hager, Rockwood and Trimco are acceptable.

B. Kick plates to be 10 inches high and Mop plates to be 6 inches high, both by 1-½ inches or 1 inch less than door width (LDW) as specified. They are to be of 16 gauge thick base metal. For door with louvers or narrow bottom rails, kick plate height to be 1 inch less dimension shown from the bottom of the door to the bottom of the louver or glass.

C. Where required armor plates, edge guards and other protective hardware shall be supplied in sizes as scheduled in the hardware sets.

D. Finish: Same as other hardware where available.

2.10 FLUSH BOLTS AND COORDINATORS

A. Provide Flush bolts with Dust Proof Strikes as indicated in the individual hardware sets by Ives, Hager, Rockwood and Trimco are acceptable. Finish shall match the adjacent hardware.

2.11 THRESHOLDS AND SEALS
A. Provide materials and finishes as listed in hardware sets. Zero products has been specified to set a high level of quality, equivalent product by manufactured by National Guard Products and Pemko shall be acceptable. All thresholds must be in accordance with the requirements of the ADA and ANSI A117.1.

B. Provide thresholds with wood screws and plastic anchors. Supply all necessary anchoring devices for weather strip and sound seal.

C. Seals shall comply with requirements of UL10C. All thresholds, door bottoms and weather strip inserts shall be a silicone based product as specified in 3.02 Hardware Sets. Other materials used shall be rejected, unless originally specified.

D. Seals shall comply with the requirements of the Wood Door Manufacturer’s certification requirements.

2.12 FINISHES

A. Finishes for all hardware are as required in this specification and the hardware sets.

B. Special care is to be taken to make uniform the finish of all various manufactured items.

2.13 DOOR SILENCERS

A. Provide door silencers at all openings without gasket. Provide two- (2) each at pair of doors and three- (3) or four- (4) each for each single door (coordinate with the frame manufacturer).

2.14 PROPRIETARY PRODUCTS

A. References to specific products are used to establish quality standards of utility and performance. Unless otherwise approved provide only the specified product.

B. All other materials, not specifically described, but required for a complete and proper finish hardware installation, are to be selected by the Contractor, subject to the approval of the Architect and the Northside ISD Representative.

C. Architect and the Northside ISD Representative reserve the right to approve all the substitutions proposed for this specification. All requests for substitution to be made prior to bid in accordance with Division 1, General Requirements, and are to be in writing, hand delivered to the Architect. Two (2) copies of the manufacturer’s brochures and a physical sample of each item in the appropriate design and finish shall accompany requests for substitution.

PART 3 - EXECUTION

3.01 INSTALLATION AND SERVICE ITEMS OF FINISH HARDWARE

A. All finish hardware shall be installed by an experienced finish hardware installer with at least ten (10) years of experience after a pre-installation meeting between the contractor, hardware Manufacturers representative, the hardware supplier, the hollow metal supplier and the wood door supplier. The finish hardware installer shall be responsible for the proper installation and function of all doors and hardware.
B. The hardware supplier’s office and/or warehouse shall be located within a one hundred twenty-five (125) mile radius of the project site as to better service the general contractor and the Northside ISD during the course of this project.

C. Check hardware against the reviewed hardware schedule upon delivery. Store the hardware in a dry and secure location to protect against loss and damage.

D. Install finish hardware in accordance with approved hardware schedule and manufacturers’ printed instructions. Pre-fit hardware before finish is applied to door; remove and reinstall after finish is complete and dry. Install and adjust hardware so that parts operate smoothly, close tightly, and do not rattle.

E. Mortise and cutting to be done neatly, and evidence of cutting to be concealed in the finished work. Protect all Finish hardware from scratching or other damage.

3.02 HARDWARE SETS
HARDWARE GROUP NO. 001 - EXTERIOR - ACCESS CONTROLLED
FOR USE ON MARK/DOOR #(#(S): A100A

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RE-USED EXISTING DOORS

HARDWARE GROUP NO. 002 - EXTERIOR
FOR USE ON MARK/DOOR #(#(S): A100A.1

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1 | EA | KEYED MULLION | KR4954-B-154 | 689 | VON  
1 | EA | PANIC HARDWARE | CD-99-DT-SNB | 628 | VON  
1 | EA | PANIC HARDWARE | CD-99-NL-SNB | 628 | VON  
1 | EA | MULLION STORAGE KIT | MT54 | 689 | VON  
1 | EA | RIM CYLINDER | 1E72 | 626 | BES  
3 | EA | MORTISE CYLINDER | 1E74 (CAM AS REQUIRED) | 626 | BES  
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2 | EA | PA MOUNTING PLATE | 4040XP-18PA | 689 | LCN  
2 | EA | CUSH SHOE SUPPORT | 4040XP-30 | 689 | LCN  
2 | EA | FLOOR STOP | FS18S | BLK | IVE  
1 | EA | RAIN DRIP | 142A-FRAME WIDTH PLUS 4" | AA | ZER  
1 | EA | MULLION SEAL | 8780NBK PSA-MULLION HEIGHT | BK | ZER  
2 | EA | DOOR SWEEP | 39A-DOOR WIDTH | AA | ZER  
1 | EA | LIPPED THRESHOLD | 65A-224-FRAME WIDTH | A | ZER  
2 | EA | WEATHER STRIP | PROVIDED BY THE DOOR MFG.  

**RE-USED EXISTING DOORS**

**HARDWARE GROUP NO. 003 – LOBBY – BALLISTIC OPENING**

**FOR USE ON MARK/DOOR #(#):**

**A100.1**

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**HARDWARE GROUP NO. 004 - BALLISTICS OPENING - ACCESS CONTROLLED**

**FOR USE ON MARK/DOOR #(#):**

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HARDWARE GROUP NO. 005 - 90 MINUTE FIRE RATED

FOR USE ON MARK/DOOR #(S):
A101

EACH TO HAVE:

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HARDWARE GROUP NO. 006 – CLINIC & STAFF TOILETS

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Administration Upgrade at 08 71 00 - 10  FINISH HARDWARE
Adams Hill Elementary School
Northside ISD
HARDWARE GROUP NO. 007 - ADMIN CORRIDOR

FOR USE ON MARK/DOOR #(S):
A101T

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HARDWARE GROUP NO. 008 - PRINCIPAL CONFERENCE & OFFICE

FOR USE ON MARK/DOOR #(S):
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HARDWARE GROUP NO. 010 - COUNSELOR

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**HARDWARE GROUP NO. 012 - ISS**

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**HARDWARE GROUP NO. 014 – TEACHERS WORK & RESOURCE ROOM**

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A101F  A101R

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Administration Upgrade at 08 71 00 - 12
Adams Hill Elementary School
Northside ISD
HARDWARE GROUP NO. 015 – TEACHERS RESOURCE ROOM

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HARDWARE GROUP NO. 017 – TEACHERS LOUNGE

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HARDWARE GROUP NO. 018 – EXTERIOR – ACCESS CONTROLLED

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CARD READER PROVIDED BY OTHER
DOOR POSITION PROVIDED BY OTHER
SWITCH PROVIDED BY OTHER

HARDWARE GROUP NO. 019 – FIRE SHUTTER

FOR USE ON MARK/DOOR #(S):
A105

EACH TO HAVE:

FOR USE ON MARK/DOOR #(S):
A102

EACH TO HAVE:

END OF SECTION
SECTION 08 81 00
GLASS AND GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide glazing of the types, sizes and locations indicated on Drawings and specified herein. The work includes glass and glazing for:
   1. Windows and storefront construction.
   2. Fire rated door vision panels, sidelights and windows.
   3. Door vision panels.

1.2 RELATED WORK IN OTHER SECTIONS

A. Section 06 41 00 – Custom Casework: Casework mirrors, framed glass doors and glass shelving.

B. Section 07 92 00 – Joint Sealants: Sealant and backer rods.

C. Section 08 11 13 – Standard Steel Doors and Frames.

D. Section 08 14 16 – Flush Wood Doors.

E. Section 08 41 13 – Aluminum Storefronts: Storefront framing.

F. DEFINITIONS: "Glass" includes prime glass, processed glass, and fabricated glass products, including glazing plastics. "Glazing" includes glass installation and materials used to install glass.

1.3 REFERENCES

A. National Fire Protection Association (NFPA):

B. Underwriters Laboratories, Inc. (UL):
   2. UL 10 C: Standard for Safety of Positive Pressure Tests of Door Assemblies.

C. Consumer Product Safety Commission (CPSC):

D. Glass Association of North America (GANA)


1.4 SYSTEM DESCRIPTION

A. Performance Requirements: At locations where fire rating is required, provide fire rating glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.
   1. Fire Rating: 90 minutes with hose stream; 45 minutes where indicated on Drawings.
   2. Fire protective, safety rated clear glazing tested in accordance with NFPA 80, NFPA 252, UL 10B and UL 10C.
3. Testing Laboratory: Fire test shall be conducted by a nationally recognized independent testing laboratory.

B. Listings and Labels:
   1. Fire rated glazing shall be under current follow-up service by a nationally recognized independent testing laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

1.5 SUBMITTALS
   A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.
   B. Samples: Submit 12 inch square samples of each type of glass indicated except for clear single-pane units.
   C. Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
      1. Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE:
   A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.
      4. Fire Resistance Rated Glass: Provide glass products that labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
   B. Thermal and Solar Optical Performance: Measured or calculated in accordance with the following:
      1. Maximum U-Values: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with NFRC 200.
      2. Maximum SHGC: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with NFRC 200.
   C. Labels: Install glass with factory or shop applied identification labels indicating manufacturer and glass quality. Leave labels in place until removal and final cleaning is approved by the Architect.
   D. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.7 DELIVERY, STORAGE, AND HANDLING:
   A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to
glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.8 JOB CONDITIONS:

A. Pre-Installation: Meet with Glazier and other trades affected by glass installations, prior to beginning of installation.

B. Do not perform work under adverse weather or job conditions. Install liquid sealants when temperatures are within lower or middle third of temperature range recommended by manufacturer.

1.9 PRODUCT WARRANTY:

A. Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

B. General Warranty: Provide a two year guarantee signed by the Installer that materials and workmanship are free of defects. Installations having water leakage, dust penetration or obvious air loss or infiltration shall be considered defective and shall be corrected at no additional cost to the Contract.

1. The use of surface applied sealant shall not be an acceptable remedy under this Warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Primary Glass Products:
   1. Guardian Industries, Inc.
   2. LOF Glass, Inc.
   3. PPG Industries, Inc.

B. Fire Protective Glazing: Technical Glass Products; 8107 Bracken Place SE, Snoqualmie, WA 98065; Telephone 800.426.0279 Fax 425.396.8300; sales@fireglass.com (Basis of Design)
   1. Firelite IGU Fire/Impact Safety Rated Insulated Glass Unit at 45 minute door and protected opening.
   2. Firelite NT at 90 minute fire rated doors.

C. Substitutions: In accordance with Section 01 60 00.

2.2 GLASS PRODUCTS, GENERAL

A. Primary Glass Standard: Provide primary glass which complies with ASTM C1036 requirements, including those indicated by reference to type, class, quality, and, if applicable, form, finish, mesh and pattern.

B. Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern. Glass manufacturer shall be responsible for providing heat-treated panes of kind as follows:
   1. Kind HS, heat-strengthened panes where determined by manufacturer to satisfy wind loading or thermal stress requirements.
   2. Kind FT, tempered panes where indicated on drawings, or if not indicated, where safety glass is required to satisfy safety glazing requirements.
C. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.3 PRIMARY GLASS PRODUCTS
A. Clear Float Glass: Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), 1/4 inch (6.0 mm) thickness unless otherwise indicated.

B. Tinted Float Glass: Based on original product, glass was Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select); 1/4 inch (6.0 mm) thick. Color of tint as follows:
   1. Bronze: Manufacturer's standard tint, with visible light transmittance of 53 percent and shading coefficient of 0.72 for 1/4 inch thick glass. PPG Industries, Inc.; "Solargrey" or approved equal matching color.
   2. Verify existing glass color and reflective properties prior to ordering.

2.4 HEAT-TREATED GLASS PRODUCTS: Manufacture heat-treated glass by using horizontal (roller hearth) manufacturing process as required to produce "tongless" or "free of tong marks" appearance.

A. Uncoated Clear Heat-Treated Float Glass: Condition A uncoated surfaces, Type I transparent glass, flat, Class 1 clear, Quality q3 (glazing select), kind as indicated below:
   2. Clear Tempered Glass: Kind FT; fully tempered prime glass which has been heat treated to strengthen glass in bending to not less than 4.5 times annealed strength; 1/4 inch thickness.

B. Uncoated Tinted Heat-Treated Float Glass: Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), with tint color and performance characteristics for 1/4" thick glass matching those indicated for non-heat-treated tinted float glass; Kind HS (heat strengthened) or FT (fully tempered).

2.1 FIRE RATED GLAZING
A. Design Requirements:
   1. Thickness: 5/16 inch thick for single pane; 1 inch thick for insulated glass unit.
   2. Appearance: clear, wireless and tint-free.
   3. Fire Rating: 45/90 minutes with hose stream.

2.2 SEALED INSULATING GLASS UNITS:
A. General: Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, spacer material, corner design and desiccant.
1. For properties of individual glass panes making up units, refer to product requirements specified elsewhere in this section applicable to types, classes, kinds, and conditions of glass products indicated.
2. Performance Classification per ASTM E774: Class A.
3. Total thickness of each Pane: 1 inch.
4. Air Space Thickness: 1/2 inch.
5. Sealing System: Manufacturer's standard.
7. Desiccant: Manufacturer's standard; either molecular sieve or silica gel or blend of both.

B. Clear Insulating Glass Units: Manufacturer's standard Low E units complying with the following requirements:
   1. Exterior Pane: Clear float glass with low E, PPG Solarban 60(2) Clear, safety, tempered.
   2. Interior Pane: Clear safety, tempered float glass.
   3. Use at exterior doors as scheduled.

C. Tinted Insulating Glass Units: Manufacturer's standard Low E units complying with the following requirements:
   1. Exterior Pane: PPG Solarban 60(2) Solar Gray, or approved equal.
   2. Interior Pane: Clear float glass.
   3. Performance Characteristics:
      a. Visible light transmittance: 35 percent minimum.
      b. Winter nighttime U-value: 0.29.
      c. Solar Heat Gain Coefficient (SHGC): 0.24
      d. Shading coefficient: 0.28.
      e. Outdoor visible reflectance: 6 percent.

2.3 GLAZING SEALANTS AND COMPONENTS:

A. Provide color of exposed sealant/compound indicated or if not otherwise indicated, as selected by Architect from manufacturer's standard colors, or black if no color is so selected. Comply with manufacturer's recommendations for selection of hardness, depending upon the location of each application, conditions at time of installation, and performance requirements as indicated. Select materials, and variations or modifications, carefully for compatibility with surfaces contacted in the installation.

B. General: Provide products of type indicated and complying with the following requirements:
   1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
   2. Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.
   3. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C920 requirements, including those for Type, Grade, Class and Uses.
   4. Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

C. 2-Part Polysulfide Glazing Sealant: Elastomeric polysulfide sealant complying with FS TT-S-227, Class A, Type 2; specially compounded and tested to show a minimum of 20 years resistance to deterioration in normal glazing applications.
2.4 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

B. Setting Blocks: Neoprene or EPDM, 70-90 durometer hardness, with proven compatibility with sealants used.

C. Spacers: Neoprene or EPDM, 40-50 durometer hardness with proven compatibility with sealants used.

D. Compressible Filler (Rod): Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

PART 3 - EXECUTION

3.1 PERFORMANCE

A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.

B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.

C. Cure Glazing: Cure glazing compounds in compliance with the manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.

3.2 PREPARATION FOR GLAZING

A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.

B. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.
3.3 GLAZING

A. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics. Inspect each piece of glass immediately before installation and eliminate any which have observable edge damage or face imperfections.

B. Install all items in accordance with recommendations of the manufacturer and to conform to the drawings. Assure that openings are square and without twist. Measure each opening in the field and cut glass to fit the actual openings with required clearances and bite on all sides. Place movable items such as operating sash in closed and locked position until glazing compound has thoroughly set. Inspect rebates and repair any condition detrimental to the final appearance or performance of the glass. Set glass with equal bearing along the entire perimeter, in full beds of glazing putty or compound or with other full perimeter seal, with proper clearances and setting blocks. Set so as to prevent displacement.

C. Setting Blocks: Install setting blocks of proper size in sill rabbet, located a distance of one fourth of the overall glass width from each corner. Set blocks in thin course of heel-bead compound, if any.

D. Spacers: Provide spacers inside and out, of proper size and spacing, for glass sizes larger than 50 united inches, except where gaskets or pre-shimmed tapes are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

E. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in channel at heel of jambs and head (do not leave voids in sill channels), except as otherwise indicated and depending on light size, thickness and type of glass, and complying with manufacturer's recommendations. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

F. Sealants: Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to the glass and channel surfaces.
   1. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
   2. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.
   3. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.

G. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in glazing system.

3.4 CURE, PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealants for high early strength and durability.

B. Damaged Glazing: Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
C. Washing Glass: Wash and polish glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer’s recommendations for final cleaning.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Gypsum board and joint treatment including glass mat faced gypsum board.
   B. Gypsum board for vertical shaftwall applications.
   C. Gypsum sheathing repair at exterior EIFS walls.
   D. Metal channel ceiling framing.
   E. Acoustic insulation.

1.2 RELATED SECTIONS
   A. Section 06 10 00 – Rough Carpentry: Wood blocking.
   B. Section 06 41 00 – Custom Casework; gypsum board used in millwork.
   C. Section 07 21 11 – Batt Insulation: Thermal insulation.
   D. Section 08 12 00 – Standard Steel Frames.
   E. Section 08 31 13 – Access Doors: Metal access panels.
   F. Section 09 22 16 – Non-Structural Metal Framing.
   G. Section 09 91 00 – Painting.

1.3 REFERENCES
   A. ASTM International:
B. Gypsum Association:
   1. GA-201 - Using Gypsum Board for Walls and Ceilings.
   3. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.


D. UL - Fire Resistance Directory.

1.4 SUBMITTALS FOR REVIEW
A. Section 01 33 00 - Submittals: Procedures for submittals.
B. Shop Drawings: Indicate special details associated with horizontal separations and acoustic seals.
C. Product Data: Provide data on gypsum board, acoustical insulation, and accessories.
D. Samples: Submit two samples of each corner and edge reinforcement.

1.5 QUALITY ASSURANCE
A. Perform Work in accordance with ASTM C754, GA-201, GA-214, and GA-216.
B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
C. Gypsum wallboard construction materials, including wallboard, accessories, fasteners and finishing materials shall be produced by one manufacturer.
D. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 REGULATORY REQUIREMENTS
A. Conform to UL - Fire Resistance Directory for fire rated assemblies in conjunction with Section 09 22 16.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Gypsum Board System:
   2. National Gypsum Co. (Gold Bond)
   3. Temple-Inland Inc.
   4. United States Gypsum (USG) Co.

B. Gypsum Sheathing:

C. Substitutions: Refer to Section 01 60 00 - Material and Equipment.
2.2 FRAMING MATERIALS

A. Studs and Tracks: Refer to Section 09 22 16 – Non-Structural Metal Framing for interior stud partitions.

B. Resilient Channels: Formed steel; minimum 25 gage thick; size and length as required, serrated face, flattened 'Z' profile.

C. Hangers: Galvanized annealed steel, 8 gage minimum, type to suit application, to rigidly support ceiling components in place, to deflection limits as indicated.

D. Fasteners: ASTM C1002 and GA-216.

E. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

F. Adhesive: ASTM C557 and GA-216.

2.3 GYPSUM BOARD MATERIALS

A. Gypsum Board: ASTM C1396, fire resistive type, UL rated; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges. Use fire rated type for all construction. Use for non-exterior vertical surfaces and ceilings, except as otherwise noted.

B. Fire-Rated Mold-Resistant Gypsum Board: ASTM C 36 and C 1396; fire resistive, moisture/mold/mildew resistant paper on front, back and long edges; Gold Bond Brand XP Fire-Shield Wallboard, Type X.
   1. Thickness: 5/8 inch.
   2. Width: 4 feet.
   3. Length: 8 feet through 12 feet.
   5. Mold and Mildew Resistance: Panel score of 8, when tested in accordance with ASTM D 3273.
   6. Application: For use at inside face of exterior walls.

C. Glass Mat Faced Gypsum Board: ASTM D 3273; gypsum panels with moisture-resistant core and coated inorganic fiberglass mat back surface designed to resist growth of mold and mildew.
   1. Interior Wall and Base Board:
      b. Width: 4 feet.
      c. Edges: Tapered.
      d. Core: Type X; UL listed.
      e. Mold and Mildew Resistance: Panel score of 10, when tested in accordance with ASTM D3273.
      f. Surface Burning Characteristics: ASTM E84; zero flame spread.
      g. Product: Dens-Armor Plus Fireguard as manufactured by Georgia Pacific, or approved equal.
   2. Locations:
      a. First 3-1/2 inches above finish floor at all interior gypsum board partitions.
      b. Base of all millwork and cabinetry.
      c. As a substitution to fire-rated mold-resistant gypsum board at inside face of exterior walls.
D. Gypsum Coreboard: ASTM C442, Type "X", 1 inch thick, maximum available size in place; beveled edges, ends square cut; maximum permissible lengths x 24 inches wide.

E. Exterior Sheathing Board; ASTM 1177, water repellent glass mat both sides, tapered long edges as follows:
   a. Standard Type: 1/2 or 5/8 inch thick; verify to match existing.
   b. Surface Burning Characteristics: ASTM E84; zero flame spread, zero smoke.
   d. Dens-Glass Gold, as manufactured by Georgia-Pacific Corporation.
   e. Provide as required for new Work at existing EIFS walls.

2.4 ACCESSORIES

A. Interior:
   1. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced, 3-1/2 inch thick; Noise Barrier or Sonobatts Sound Attenuation Blankets manufactured by Owens-Corning Fiberglass.
   2. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board; gunnable type as recommended by the gypsum manufacturer. Comply with the VOC content requirements in the applicable category of SCAQMD Rule 1168.
   3. Corner Beads: Galvanized metal; smooth rigid nose, perforated and knurled metal flanges; CB-114 by 114.
   4. Edge Trim: GA-201 and GA-216; Type L and U exposed reveal bead.
   7. Fasteners: ASTM C1002, Type S12 and GA-216.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 26 00 – Coordination and Meetings: Verification of existing conditions before starting work.

B. Verify that site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 METAL STUD INSTALLATION

A. Install metal studs in accordance with 09 21 16.

3.3 WALL FURRING INSTALLATION

A. Erect wall furring for direct attachment to concrete masonry and concrete walls.

B. Erect furring channels vertically; space maximum 16 inches on center, not more than 4 inches from floor and ceiling lines or abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

C. Install thermal insulation in conjunction with Section 07 21 00.
3.4 **CEILING FRAMING INSTALLATION**

A. Install in accordance with ASTM C754, GA-201 and GA-216.

B. Coordinate location of hangers with other work.

C. Install ceiling framing independent of walls, columns, and above ceiling work.

D. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.

E. Laterally brace entire suspension system.

3.5 **ACOUSTIC ACCESSORIES INSTALLATION**

A. Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

B. Where scheduled on Drawings, place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

C. Install acoustic sealant at gypsum board perimeter at:
   1. Base layer of double layer gypsum board.
   2. Face layer of single layer gypsum board.

D. Caulk all penetrations of partitions by conduit, pipe, ductwork and rough-in boxes.

3.6 **GYPSUM BOARD INSTALLATION**

A. Install gypsum board in accordance with GA-201 and GA-216.

B. Erect single layer gypsum board vertically, with ends and edges occurring over firm bearing.

C. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.

D. Use screws when fastening gypsum board to metal furring or framing.

E. Double Layer Applications: Place first layer perpendicular to framing or furring members. Place second layer perpendicular to first layer. Insure joints of second layer do not occur over joints of first layer.

F. Treat cut edges and holes in exterior gypsum soffit board with sealant.

G. Place control joints consistent with lines of building spaces and as directed by Architect. Coordinate to match with tile control joint where applicable but not more than 25 foot on center.

H. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials and at other locations where detailed. Install reinforcing tape at internal corners.
3.7 SHAFT WALL INSTALLATION
A. Shaft Wall Framing: In accordance with Section 09 22 16 and manufacturer's instruction.
B. Coreboard Installation: Install coreboard shaftwall liner as framing is erected, or on floor for tilt-up installation with framing. Follow manufacturer's framing and liner specifications and details.

3.8 JOINT TREATMENT
A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
B. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.
C. Tape and fill at concealed parts of partitions extending above ceiling, but sanding is not required.
D. Fill dimples at fastener heads and marred spots on face of board with one coat of joint compound and two coats finishing compound, in same manner as at joints.
E. Provide a Level 4 finish in accordance with GA-214. Coordinate with provisions of Section 09 91 00 - Painting.
F. Remove and re-install defective work.

END OF SECTION
SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Formed metal stud framing at interior locations.
B. Framing accessories.

1.2 RELATED SECTIONS

A. Section 04 20 00 – Unit Masonry Assemblies: Veneer masonry at metal stud back up walls.
B. Section 05 50 00 – Metal Fabrications: Metal fabrications attached to stud framing.
C. Section 06 10 00 – Rough Carpentry: Rough wood blocking within stud framing and wall sheathing.
D. Section 07 21 11 – Batt Insulation: Insulation between framing members.
E. Section 07 60 00 – Sheet Metal Flashing and Trim: Head and sill flashings.
F. Section 08 12 00 – Steel Frames: Door openings within stud framing.
G. Section 08 31 13 – Access Doors.

1.3 REFERENCES

D. ASTM C645 – Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.

G. ML/SFA 540 – (Metal Lath/Steel Framing Association, Division of National Association of Architectural Metal Manufacturers) - Lightweight Steel Framing Manual.

H. SSPC Paint 20 (Steel Structures Painting Council) - Zinc Rich Primers.

1.4 SYSTEM DESCRIPTION

A. Exterior Wall Dead and Live Loads: Design and size components to withstand loads caused by positive and negative pressure of wind acting normal to plane of wall in accordance with 2015 International Building Code to a design pressure of 20 lb/sq ft.

B. Interior Walls: Metal stud framing system with batt type acoustic insulation where scheduled on Drawings and specified in Section 09 21 16.

C. Maximum Allowable Deflection:
   1. 1:240 span at exterior metal wall panels.
   2. 1:600 span at exterior masonry veneer systems.

D. Wall System:
   1. Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   2. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.5 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Shop Drawings:
   1. Indicate prefabricated work, component details and accessories or items required of other related work.
   2. Describe method for securing studs to tracks, and for blocking and reinforcement to framing connections.

C. Product Data: Provide data describing standard framing member materials and finish, product criteria, load charts and limitations.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C754 and ML/SFA 540.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

C. Form, fabricate, install, and connect components in accordance with ML/SFA 540.
D. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Dietrich Industries, Inc.
B. California Expanded Metal Company (Cemco).
C. Delta Metal Products, Inc.
D. Substitutions: In accordance with Section 01 60 00.

2.2 STUD FRAMING MATERIALS

A. Studs: ASTM A525 Coating Class C, non-load bearing rolled steel, channel shaped, containing 30 to 35 percent recycled steel; punched for utility access as follows:
   1. Depth: As indicated on Drawings.
   2. Thickness: 20 gauge thick minimum, except as otherwise indicated, or required to comply with allowable deflection limitations.
      a. Exterior walls: 18 gauge minimum.
B. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs.
C. Shaftwall Studs: Screw-type C-H shape, 20 gage, galvanized; 2-1/2 inch depth minimum except as required to span distances vertically without exceeding minimum lateral deflection of L/240.
D. Ceiling Runners: With extended leg retainer.
E. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.
F. Fasteners: ASTM C1002, self drilling, self tapping screws.
G. Sheet Metal Backing: 0.036 inch galvanized steel.
H. Anchorage Devices: Power actuated, drilled expansion bolts, screws with sleeves as required to suit application.
I. Acoustic Sealant: As specified in Section 09 21 16.
J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I Inorganic or Type II Organic zinc rich.

2.3 FABRICATION

A. Fabricate components of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
B. Fit and assemble in largest practical sections for delivery to site, ready for installation.
2.4 **FINISHES**  
A. Studs, Tracks and Headers: Galvanize to G60 coating class.  
B. Accessories: Same finish as framing members.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

A. Section 01 26 00 - Coordination and Meetings: Verification of existing conditions before starting work.  
B. Verify that rough-in utilities are in proper location.

**3.2 ERECTION**

A. Align and secure top and bottom runners at 16 inches on center.  
B. Achieve an air tight seal between runners and substrate with acoustic sealant in conjunction with Section 07 92 00.  
C. Achieve an air tight seal between studs and adjacent vertical surfaces with acoustic sealant in conjunction with Section 07 92 00.  
D. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.  
E. Install studs vertically at 16 inches, except as otherwise indicated on Drawings.  
F. Align stud web openings horizontally.  
G. Secure studs to tracks using fastener method. Do not weld.  
H. Stud splicing not permissible except where stud height exceed maximum fabrication lengths. Splice studs with 8 inch nested lap, secure each stud flange with flush head screw.  
I. Fabricate corners using a minimum of three studs.  
J. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.  
K. Brace stud framing system rigid.  
L. Coordinate erection of studs with requirements of door frames, window frames, and other openings; install supports and attachments.  
M. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.  
N. Blocking:  
   1. Secure wood blocking to studs.  
   2. Secure steel backing to studs using three number 10 screws.  
   3. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, opening frames, and other locations indicated on Drawings.
O. Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.

P. At partitions which extend and terminate 6 inches above finished ceiling, provide sway bracing at 48 inches on center.

Q. Coordinate placement of insulation in stud spaces after stud frame erection.

R. Shaftwall Framing: Install shaftwall framing at horizontal separations in accordance with CABO National Evaluation Service Report Number 258 and with manufacturer's cavity shaftwall specifications and details for one and two hour fire ratings.

3.3 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Control: Tolerances.

B. Maximum Variation From True Position: 1/8 inch in 10 feet.

C. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION
SECTION 09 30 00
TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes ceramic tile for floor and wall applications.
B. Wall adhesives and grouted joints.
C. Related Sections:
   1. Section 04 20 00 – Unit Masonry Assemblies: Wall substrate.
   2. Section 07 92 00 – Joint Sealants: Expansion and control joint components.
   4. Section 22 40 00 – Plumbing Fixtures.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A108.1 - Installation of Ceramic Tile, A collection.
   2. ANSI A108.4 - Specifications for Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile Setting Epoxy Adhesive.
   3. ANSI A108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
   5. ANSI A118.4 - Latex-Portland Cement Mortar.
   6. ANSI A118.6 - Ceramic Tile Grouts.
   8. ANSI A137.1 - Ceramic Tile.

B. Tile Council of America:

1.3 SUBMITTALS

A. Section 01 33 00 - Submittals: Submittal procedures.
B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, ceramic accessories, and setting details.
C. Product Data: Submit instructions for using grouts and adhesives.
D. Samples: Submit tile and grout to illustrate color, pattern, and color variations.
E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Execution Requirements: Closeout procedures.
B. Operation and Maintenance Data: Submit recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
1.5 QUALITY ASSURANCE
   A. Perform Work in accordance with TCA Handbook and ANSI A108 Series/A118 Series.

1.6 QUALIFICATIONS
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
   B. Installer: Company specializing in performing Work of this section with minimum three years documented experience and approved by tile manufacturer.

1.7 MOCKUP
   A. Section 01 40 00 - Quality Requirements: Requirements for mockup.
   B. Construct mock-up, 6 feet long by 6 feet wide, with waterproofing, finish grout, and specified accessories.
   C. Locate where directed by Architect/Engineer.
   D. Incorporate accepted mockup as part of Work.

1.8 PRE-INSTALLATION MEETINGS
   A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
   B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING
   A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
   B. Protect adhesives and grouts from freezing or overheating.

1.10 ENVIRONMENTAL REQUIREMENTS
   A. Section 01 60 00 - Product Requirements.
   B. Do not install adhesives and grouts in unventilated environment.
   C. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.11 EXTRA MATERIALS
   A. Section 01 77 00 - Execution Requirements: Spare parts and maintenance products.
   B. Supply 10 sq ft of each size, color, and surface finish of tile specified.

PART 2 - PRODUCTS

2.1 TILE
   A. Manufacturers:
      1. American Olean Tile Co.
      3. Substitutions: Section 01 60 00 - Product Requirements.
2.2 TILE

A. Ceramic Floor Tile: ANSI A137.1, conforming to the following:
   1. Moisture Absorption: 0 to 0.5 percent.
   2. Size: 2 x 2 x 5/16 inch.
   3. Shape: Square.
   4. Edge: Cushioned.
   5. Surface Finish: Matte glazed.

B. Ceramic Wall Tile: ANSI A137.1, conforming to the following:
   1. Moisture Absorption: 0 to 0.5 percent.
   2. Size: 4 1/4 x 4 1/4 x 5/16 inch.
   3. Shape: Square.
   4. Edge: Cushioned.

2.3 SETTING MATERIALS

A. Manufacturers:
   1. Laticrete International.
   2. Bonsal American, Inc.
   3. Custom Building Products.
   4. Tex-Rite, Texas Cement Products.
   5. Substitutions: In accordance with Section 01 60 00.

B. Adhesive Materials:
   1. ANSI A136.1, Type 1, thin set bond type; solvent-free, low VOCs.
   2. Products:
      a. Mapei Ultramastic ECO High-Performance Floor and Wall Tile Adhesive.
      b. Custom Building Products “VersaBond Flex” thin-set mortar or approved equal.
      c. Substitutions: In accordance with Section 01 60 00.

C. Grout Materials:
      a. Color Admixture: Custom Building Products, Laticrete, or approved equal.
      b. Color: Refer to Section 09 99 50 – Room Finish/Color Schedule.

D. Thresholds: Marble type, honed finish, 2 inch wide by full width of frame opening, beveled both sides, radiused edges from bevel to vertical face.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify surfaces are ready to receive work.

3.2 PREPARATION

A. Protect surrounding work from damage.
B. Vacuum clean surfaces and damp clean.


3.3 INSTALLATION

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, and TCA Handbook recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Place edge strips at exposed tile edges.

D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base and wall joints.

E. Place tile with joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

F. Form internal angles coved and external angles bullnosed.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep expansion and control joints free of adhesive or grout. Apply sealant to joints.

I. Allow tile to set for a minimum of 48 hours prior to grouting.

J. Grout tile joints. Use standard colored grout unless otherwise indicated.

K. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

L. Installation - Floors - Thin-Set Method:
   1. Over concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

M. Installation - Wall Tile, General:
   1. Over gypsum wallboard on metal studs install in accordance with TCA Handbook Method W223, thin-set with inorganic adhesive, unless otherwise indicated.
   2. Over concrete and masonry install in accordance with TCA Handbook Method W223, thin-set with inorganic adhesive cement bond coat.

3.4 CLEANING

A. Section 01 77 00 - Execution Requirements: Final cleaning.

B. Clean tile and grout surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 77 00 - Execution Requirements: Protecting installed construction.

B. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system and perimeter trim.
B. Acoustical units.

1.2 RELATED SECTIONS

A. Section 09 21 16 – Gypsum Board Systems: partition system.
B. Division 21 – Fire Sprinklers.
C. Division 23 - Air Outlets and Inlets: Air diffusion devices in ceiling system.
D. Division 26 - Interior Luminaries: Light fixtures in ceiling system.
E. Division 26 – Fire Alarm and Smoke Detection Systems: Fire alarm components in ceiling system.

1.3 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
C. ASTM E1264 - Classification of Acoustical Ceiling Products.
D. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

1.4 QUALITY ASSURANCE

A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00.
B. Product Data: Provide data on metal grid system components and acoustical units including pre-consumer and post-consumer recycled content.
C. Samples: Submit two samples 12 by 12 inch in size illustrating material and finish of acoustical units.

D. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner and edge trim.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.6 QUALIFICATIONS

A. Qualification of Installer: Minimum of three years documented experience in installations of similar scope.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for combustibility requirements for materials.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F degrees C, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.9 SEQUENCING

A. Sequence Work under the provisions of Section 01 11 00.

B. Sequence Work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead Work is completed, tested, and approved.

C. Install acoustical units after interior wet work is dry.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Section 01 77 00.

B. Provide two (2) percent of total acoustical unit area of extra panels to Owner.

C. Provide one (1) unopened box of suspension material.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong World Industries, Inc; Prelude 15/16 inch Exposed Tee

B. USG Interiors, Donn Suspension Systems.

C. Chicago Metallic.

D. Substitutions: Under provisions of Section 01 60 00.
2.2 SUSPENSION SYSTEM MATERIALS

A. Non-fire Rated Grid: ASTM C635, intermediate duty; exposed Tee; components die cut and interlocking.

B. Grid Materials: Double-web steel construction; commercial quality cold rolled steel with galvanized coating.

C. Exposed Grid Surface Width: 15/16 inch.

D. Grid Finish: Baked polyester finish; Color as selected by Architect.

E. Accessories: Specifically designed as an integral part of grid system as per manufacturer's recommendations.

F. Support Channels and Hangers: Primed steel; size and type to suit application and ceiling system flatness requirement specified.

G. Total Recycled Content: 30 percent.

2.3 MANUFACTURERS - ACOUSTICAL UNITS

A. Armstrong World Industries, Inc.

B. Owens-Corning – Conwed Designscape Corporation.

C. USG Interiors, Inc.

D. Substitutions: Under provisions of Section 01 60 00.

2.4 ACOUSTICAL UNIT MATERIALS

A. Acoustical Tile (AT/1): ASTM E1264, conforming to the following:
   1. Size: 24 by 48 inches.
   2. Thickness: 5/8 inch.
   3. Composition: Wet form mineral fiber.
   4. Light Reflectance: Actual LR 0.80.
   5. NRC Range: 0.55.
   7. Fire Hazard Classification: Class A.
   10. Surface Finish: Factory applied vinyl latex paint.
   11. Recycled Content: 26 percent.
   12. Manufacturer: Armstrong Fissured #755, or approved equal.

2.5 ACCESSORIES

A. Touch-up Paint: Latex; type and color to match acoustical and grid units.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 40 00.

B. Verify that layout of hangers will not interfere with other Work.
3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Install suspension system in accordance with manufacturer's instructions and as supplemented in this Section.

B. Install suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

C. Locate system on room axis according to Reflected Ceiling Plan.

D. Install after major above ceiling Work is complete. Coordinate the location of hangers with other Work.

E. Hang suspension system from steel joists and supplemental carrying members spaced in between joists.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

3.3 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Lay directional patterned units in pattern directed by Architect. Fit border trim neatly against abutting surfaces.

D. Install units after above ceiling Work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp and dents.

F. Cut panels to fit irregular grid and perimeter edge trim.

G. Where round obstructions occur, provide preformed closers to match edge molding.

H. Install hold-down clips to retain panels tight to grid system within 20 feet of any exterior door.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
SECTION 09 65 00
RESILIENT FLOORING

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Section includes resilient tile flooring; resilient base, and resilient stair accessories.
B. Resilient moldings, transition strips and reducers.

1.2 RELATED SECTIONS
A. Section 03 30 00 – Cast-In-Place Concrete.

1.3 REFERENCES
A. ASTM International:

B. GREENGUARD Environmental Institute:
   1. GREENGUARD Gold.

C. Federal Specification Unit:
   1. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant.


E. NSF/ANSI Standard 332 – Sustainability Assessment for Resilient Floor Coverings

F. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

1.4 QUALITY ASSURANCE
A. Installer shall have no less than three years documented experience in applications of similar material and quantity.

B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

C. Products shall contain a FloorScore Certification; Tested and Certified by RFCl and SCS. Re: www.RFCI.com and www.scscertified.com.
D. Adhesives and sealants shall be low emitting in accordance with the current VOC content limits of South Coast Air Quality Mgt. District (SCAQMD) Rule #1168.

1.5 SUBMITTALS

A. Submit samples in accordance with Section 01 30 00.
   1. Include duplicate 3 by 3 inch sized samples of each flooring material, color and pattern selected.
   2. Include duplicate samples of base and edge strips selected.

B. Submit manufacturer’s product data, including recycle content, certifications, and environmental data.

C. Submit manufacturer's installation instructions under provisions of Section 01 30 00. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 EXTRA MATERIAL

A. Deliver additional 2 percent of total area installed for each color and pattern of floor material required for project, in manufacturer's box, for maintenance use.

B. Clearly identify each box.

1.8 WARRANTY

A. Provide Manufacturer's limited wear warranty for five years for heavy traffic.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Vinyl Composition Tile:
   1. Armstrong Commercial Flooring.
   2. Azrock Industries, Inc.

B. Rubber Base:
   1. Armstrong Commercial Flooring.
   2. Roppe Rubber Corporation.
   3. Burke Flooring, a subsidiary of Burke Industries (Mannington Mills).

C. Rubber Stair Treads and Risers:
   1. Roppe Corporation.
   2. Burke Flooring.
   3. Marley Floors-Flexco.

D. Accessories:
   1. Roppe Rubber Corporation.
2. Mercer Plastics Co., Inc.
3. Flexco Company.

E. Substitutions: Under provisions of Section 01 60 00.

2.2 MATERIALS - TILE FLOORING

A. Vinyl Composition Tile (General): ASTM F1066, Class 2:
2. Size: 12 by 12 inch.
3. Thickness: 0.125 inch.
4. FloorScore Indoor Air Quality: SCS Certified.
5. NSF/ANSI-332 Certification: Gold.
7. Product: Armstrong Standard Excelon Imperial Texture, or approved equal.

2.3 MATERIALS - BASE

A. Base: FS SS-W-40, Type 1 rubber; top set coved; premolded corners:
1. Height: 4 inch.
2. Thickness: 1/8 inch.
3. Length: 4 foot sections.

2.4 MATERIALS – RAMP COVERING

A. Raised Design Rubber Tile: ASTM F 1344, Class I, Type A & B, Grade 1. Tiles shall be homogeneously constructed of first-quality resilient rubber compound and molded with a design profile and beveled disks.
1. Style: #992 low profile raised circular design as manufactured by Roppe, or approved equal.

2.5 ACCESSORIES/ADHESIVES/SEALERS

A. Moldings and Edge Strips: Beveled edge type; smooth finish; 1/8 by 1 inch color selected by Architect.

B. Sub-Floor filler: Cementitious; type recommended by adhesive material manufacturer.

C. Adhesive: Thin-spread, solvent-free, asphalt emulsion/latex-based adhesive; low emitting in accordance with the current VOC content limits of South Coast Air Quality Mgt. District (SCAQMD) Rule #1168:
1. Henry 130 Thin Spread Floor Tile Adhesive.
2. Substitutions: In accordance with Section 01 60 00.

D. Sealer and Wax: By School District.
PART 3 - EXECUTION

3.1 SITE AND SUBSTRATE CONDITIONS

A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet.

B. Ensure concrete floors are dry (maximum 7 percent moisture content) and exhibit negative alkalinity, carbonization or dusting.

C. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

D. Maintain minimum 70 degrees F. air temperature at flooring installation area for 3 days prior to, during, and for 24 hours after installation.

E. Store flooring materials in area of application. Allow 3 days for material to each equal temperature as area; allow 8 days for rubber flooring.

3.2 LEVELING

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

B. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.

3.3 INSTALLATION - FLOORING

A. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.

B. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

C. Set flooring in place; press with heavy roller to ensure full adhesion.

D. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

E. Install tile with minimum tile width 1/2 full size at room or area perimeter, to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern.

F. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

G. Terminate resilient flooring at centerline of door opening(s) where adjacent floor finish is dissimilar.

H. Install edge strips at unprotected or exposed edges where flooring terminates.

I. At movable partitions or accordion doors, install flooring under partitions without interrupting floor pattern.
J. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tight and vertical. Install in maximum practical lengths. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, "V" cut back of base strip to 2/3 of its thickness and fold. Use pre-molded sections for exposed ends.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Section 01 77 00 – Contract Closeout: Cleaning installed work.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

C. Clean, seal, and wax resilient flooring products in accordance with manufacturer’s instructions.

3.6 PROTECTION

A. Prohibit traffic from floor finish for 48 hours after installation.

END OF SECTION
SECTION 09 91 00
PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Extent of Work: The extent of work to be painted or finished include the following:
   1. All surfaces of materials, either on the exterior or interior of the building, except where painting or finishing are excluded as listed herein below.
   2. Paint or finish all surfaces left unfinished by other trades.
   3. Touch-up all damaged, defaced, or scratched areas. Touch-up all screwheads, boltheads, etc. as required.
   4. All new exposed mechanical piping, ductwork, plumbing and electrical associated with air conditioning of Gymnasiums.

B. Surfaces Not To Be Painted, Unless Specifically Specified, Noted, or Scheduled Otherwise:
   1. Any drywall or CMU permanently concealed from view.
   2. Complete factory applied finish.
   3. Finish hardware except where primed for paint finish.
   4. Aluminum.
   5. Plumbing fixtures and toilet room accessories.
   7. Acoustical surfaces, except as scheduled to be field painted.
   8. Any glass, plastics, floor and wall tiles, rubber bases, face bricks, and vinyl wall coverings.
   9. Steel deck and joist in concealed locations.
   10. Concrete floor.

C. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections.

D. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

1.2 RELATED SECTIONS

A. Section 04 20 00 – Unit Masonry Assemblies.
B. Section 05 50 00 – Metal Fabrications
C. Section 06 20 00 – Finish Carpentry
D. Section 08 12 00 – Steel Doors
E. Section 08 14 16 – Wood Doors.
F. Section 09 21 16 – Gypsum Board Systems
G. Section 09 99 50 – Finish/Color Schedule

1.3 REFERENCES

A. SSPC-SP 1 - Solvent Cleaning
19-210

B. SSPC-SP 2 - Hand Tool Cleaning
C. SSPC-SP 3 - Power Tool Cleaning
D. SSPC-SP 13 / Nace No. 6 Surface Preparation for Concrete
E. EPA-Method 24
F. GreenGuard
G. CDHS - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.
H. South Coast Air Quality Management District (SCAQMD): Standard 1113- for architectural coatings.

1.4 VOLATILE ORGANIC COMPOUNDS (VOC) COMPLIANCE

A. Products provided under this Section shall meet VOC requirements of the South Coast Air Quality Management District Standard 1113 for architectural coatings, www.scaqmd.gov and CDHS Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

1.5 QUALITY ASSURANCE

A. Include on label of containers:
   1. Manufacturer's name
   2. Type of paint
   3. Manufacturer's stock number
   4. Color
   5. Instructions for reducing, where applicable; Note that improper reducing may negatively affect the VOC rating of the product. Products found to have VOC emissions in excess of those specified herein, or by the manufacturer, shall be considered to be defective and shall be removed and replaced with conforming products at the Contractor's expense.
   6. Label Analysis: (Federal Specification Number)

B. Sampling of Materials, when requested by the Architect:
   1. Obtain test samples from material stored at project site or source of supply.
   2. Furnish from materials designated by the Architect/Engineer as follows: 1 quart from batches of 50 gal. or less.
   3. Select samples at random from sealed containers.

C. Fungus Control for Mildew Resistant Materials: Organic coating shall show no fungus growth when tested as specified in Federal Test Method Standard No. 141, Method 6271.1.

D. Field Quality Control:
   1. Request review of first finished room, space, or item of each color scheme required by Architect for color, texture, and workmanship.

E. Contractor shall be required to remove and replace all substrates whose moisture content exceeded those recommended by the paint manufacturer or the substrate manufacturer at the time painting was performed.

F. The building must be under full climatic control prior to painting.

G. Notify Architect at least 24 hours prior to painting.
H. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 SUBMITTALS

A. Color Samples:
1. Size shall be at least 8-1/2 by 11 inches.
2. Colors shall be in accordance with furnished schedules. Provide samples of every color and finish required.
3. Prepare at project site on a material similar in texture to that to which it is to be applied.
4. Submit in duplicate for approval by the Architect.
5. Manufacturer’s printed VOC data.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials: Deliver sealed containers with labels legible and intact.

B. Storage of Materials:
1. Store only acceptable project materials on project site.
2. Store in a suitable location.
3. Restrict storage to paint materials and related equipment.
4. Comply with health and fire regulations.

C. Deliver and store in accordance with Section 01 60 00.

1.8 JOB CONDITIONS

A. Environmental Requirements:
1. Comply with manufacturer’s recommendations as to environmental conditions under which coatings and coating systems can be applied.
2. Do not apply finish in areas where dust is generated.

B. Protection:
1. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Except as otherwise specified, materials shall be VOC compliant materials as manufactured by:
1. Sherwin-Williams Co. (Basis of Design)
2. Benjamin Moore.
4. PPG.
6. Substitutions in accordance with Section 01 60 00.
B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer.

### 2.2 SUBSTITUTIONS

A. Comply with Conditions of the Contract and Division 1.

B. Submit substitute paint schedule listing all surfaces and proposed products. VOC numbers may not exceed those listed in paragraphs 2.4 and 2.5.

C. Obtain review prior to purchase and delivery.

### 2.3 MATERIALS

A. Secondary products not specified by name and required for the job such as thinners and putty shall be "best grade" or "first line", lowest commercially available VOC products of a reputable manufacturer.

B. All interior paint shall be semi-gloss enamel unless specifically noted otherwise.

### 2.4 INTERIOR PAINTING - ENAMEL FINISH

<table>
<thead>
<tr>
<th>Materials</th>
<th>Film Thickness</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mils dft/coat</td>
<td>g/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Gypsum Board (Enamel Finish)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Light Orange Peel Texture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Primer: ProMar 200 Zero VOC Interior Latex Primer B28W02600</td>
<td>1.5</td>
<td>0</td>
</tr>
<tr>
<td>3. Finish: ProMar 200 Zero VOC Interior Latex Semi-gloss B31-2600 (2 coats)</td>
<td>1.7</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. CMU (Enamel Finish)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Block Fill: PrepRite Block Filler B25W25 (two coats)</td>
<td>8.0</td>
<td>45</td>
</tr>
<tr>
<td>2. Finish: ProMar 200 Zero VOC Interior Latex Semi-gloss B31-2600 (2 coats)</td>
<td>1.7</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Interior Galvanized Metal</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Primer: Pro Industrial Pro-Cryl Universal Acrylic Primer B66-310</td>
<td>4.0</td>
<td>&lt;100</td>
</tr>
<tr>
<td>1. Finish: Pro Industrial 0 VOC Semi-Gloss Acrylic B66-650 (two coats)</td>
<td>3.0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. Interior Ferrous Metal (primed and unprimed)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Primer: Pro Industrial Pro-Cryl Universal Acrylic Primer B66-310</td>
<td>4.0</td>
<td>&lt;100</td>
</tr>
<tr>
<td>1. Finish: Pro Classic Interior WB Acrylic-Alkyd B31 Semi-gloss B34-850 (two coats)</td>
<td>1.6</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. Interior Wood (Enamel)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Primer: Premium Wall &amp; Wood Primer B28W08111</td>
<td>1.8</td>
<td>41</td>
</tr>
<tr>
<td>2. Finish: Pro Industrial 0 VOC Semi-Gloss Acrylic B66-650 (two coats)</td>
<td>1.6</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F. Interior Wood (Transparent/Clear Finish)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Finish: Minwax Polycrylic Protective Finish (two coats)</td>
<td>.6</td>
<td>275</td>
</tr>
</tbody>
</table>
G. Intumescent Fire Retardant Paint (Water Base, Flat Latex)
   1. Primer: Premium Wall & Wood Primer B28W08111         1.8  41
   2. Finish: Flame Control No. 20-20A
               Flat Latex (two coats)                    4.7  60

2.5 EXTERIOR PAINTING

A. Exterior EIFS:
   1. Finish: Loxon XP Zero VOC Waterproofing System
               A24 Series (two coats)     3.7          0

2.6 COLORS

A. Interior/Exterior Finish Colors are scheduled in Section 09 99 50. Colors of paints (including
   stains) shall match control samples.

2.7 MIXING AND TINTING

A. Deliver paints and enamels ready-mixed to Project Site.
B. Accomplish job mixing and job tinting only when acceptable to the Architect/Engineer. No
   mixing or tinting shall be allowed inside the building.
C. Mix only in mixing pails placed in suitably sized non-ferrous or oxide resistant metal pans.
D. Use tinting colors recommended by manufacturer for the specific type of finish.
E. Fungicidal agent shall be incorporated into the paint by the manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely
   affect execution, permanence or quality of work and which cannot be put into an acceptable
   condition through preparatory work as included in Paragraph 3.2, PREPARATION OF
   SURFACES.
B. Do not proceed with surface preparation or coating application until conditions are suitable.

3.2 PREPARATION OF SURFACES

A. General:
   1. Perform all preparation and cleaning procedures in strict accordance with paint
      manufacturer's instructions and as herein specified for each substrate.
   2. Remove or provide suitable masking of all hardware, hardware accessories,
      machined surfaces, labels, nameplates, etc. prior to surface preparation and painting.
      Reinstall the removed items by workmen skilled in the trades involved.
   3. Do not apply initial coating until moisture content of surface is within limitations
      recommended by paint manufacturer.
      a. Test with moisture meter.
   4. Priming coats on woodwork shall be applied as required and as soon as possible
      after woodwork is delivered to the building.
   5. Top and bottom edges of all wood doors shall be stained and given one good coat of
      varnish after fitting and before final hanging.
6. All interior wood trim and finish, etc., set over or on masonry shall be backprimed before erection with a good coat of shellac.

B. Woods:
1. Clean soiled surfaces in accordance with manufacturer's instructions.
2. Sand to smooth and even surface, then dust off.
3. Fill nail holes, cracks, open joints and other defect with putty after priming coat has dried. Color to match finish color.

C. Gypsum Board Surfaces exposed to view, not scheduled to receive wallcovering:
1. Fill narrow, shallow cracks and small holes with spackling compound.
2. Rake deep, wide cracks and deep holes.
   a. Dampen with clear water.
   b. Fill with thin layers of drywall joint cement.
3. Allow to dry.
6. Texture: "Orange Peel".

D. Ferrous Metal Surfaces:
1. Prepare surface in accordance with recommendations of directions of manufacturer of rust-inhibitive primer.
2. Feather edges of sound paint by grinding, if necessary.

E. Galvanized Metal:
1. Clean surface with mineral spirits to remove oil residue.
2. Dry with clean cloth.

3.3 WORKMANSHIP - MINIMUM REQUIREMENTS

A. Application of materials shall be by skilled mechanics. Spread paint evenly and brush out thoroughly. Flow-on lacquer, varnish and enamel evenly and smoothly, and free from brush marks. Workmanship shall be in accordance with the best practices recognized for class of work, grade, type and kinds of materials specified.

3.4 APPLICATION

A. General Requirements:
1. Oil finish shall be used as it comes from manufacturer's containers without thinning or adulterating.
2. Apply paint enamel and epoxy finish with suitable brushes or rollers.
   a. Rate of application shall not exceed that as recommended by paint manufacturer for the surface involved less ten percent allowance for losses.
   b. Keep brushes and rollers clean, dry, free from contaminates and suitable for the finish required.
3. Comply with recommendation of product manufacturer for drying time between succeeding coats.
4. Vary slightly the color of successive coats.
5. Sand and dust between each coat to remove defects visible from a distance of 5 feet.
6. Finish coats shall be smooth, free of brush marks, streaks, laps or pile up of paints, and skipped or missed areas.
   a. Finished metal surfaces shall be free of skips, voids or pinholes in any coat when tested with a low voltage detector.
7. Inspection:
a. Do not apply additional coats until completed coat has been inspected by the Architect.
b. Only inspected coats of paint will be considered in determining number of coats applied.
c. Leave all parts of moldings and ornaments clean and true to details with no undue amount of paint in corners and depressions.
d. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
e. Apply primer on all work before glazing.
f. Change colors at corner of stop where colors differ between adjoining spaces or rooms and where door frames match wall colors.
g. Refinish whole wall where portion of finish has been damaged or is not acceptable.
h. Minimum Total Dry Film Thickness:
   1) Apply material at not less than manufacturer's recommended spreading rate.
   2) Provide not less than 5 mils thickness for the entire coating system of prime and finish coats for 3-coat system.
i. Provide not less than 3.5 mils thickness for the entire coating system of prime and finish coats for 2-coat system.
j. Do not paint over U.L. labels on doors and frames.
k. Environmental conditions such as temperature and humidity shall be within ranges recommended by product manufacturer.
l. Finish materials shall be compatible with the surface to which it is applied. Prepare wood surfaces as recommended by manufacturer prior to any finish application.

B. Mechanical and Electrical Equipment:
   1. General:
      a. This sub-contractor shall paint all mechanical and electrical equipment, piping, conduit, insulation, ductwork, hangers, accessories, etc., that are exposed to view.
      b. All Mechanical/Electrical equipment delivered to job with suitable factory prime or baked enamel protective finishes shall be painted after installation as hereinafter specified.
      c. Factory prime coat finish shall receive two field coats of alkyd enamel. Factory baked enamel finishes shall be field painted by touching up abraded surfaces and applying a final coat of alkyd enamel.
      d. All machinery and equipment not finished at the factory shall be cleaned, primed and then finish painted two coats of alkyd enamel.
      e. Internal surfaces of ducts or surfaces above ceiling where exposed to view behind grilles or registers shall be painted with one or more coats to cover of flat black.
      f. Electrical panelboards shall be given one coat of alkyd enamel unless approved as being with a satisfactory finish when ready for acceptance.
      g. Emergency panel covers and doors shall be painted red.
      h. Nameplates, instruments, gauges, etc., shall not be painted and suitable protection shall be afforded to these items to prevent their being rendered illegible during the painting operations. Following the paintwork, all masking, etc., shall be removed, leaving these items in "as new" condition.

3.5 CLEANING
   A. Touch up and restore finish where damaged.
B. Remove spilled, splashed, or splattered paint from all surfaces.
C. Do not mar surface finish of item being cleaned.
D. Leave storage space clean and in condition required for equivalent spaces in project.
E. During the progress of the work, remove from the project site at the end of each day, all discarded paint materials, rubbish, cans and rags.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Surface preparation.
B. Wall covering.
C. Wall covering for tackable wall surfaces as designated on Drawings.

1.2 RELATED SECTIONS
A. Section 09 21 16 - Gypsum Board Systems: Wall substrate.

1.3 REFERENCES
C. ASTM F793 - Standard Classification of Wallcovering by Durability Characteristics.

1.4 SUBMITTALS FOR REVIEW
A. Section 01 33 00 - Submittals: Procedures for submittals.
B. Product Data: Provide data on covering and adhesive.
C. Shop Drawings: Indicate wall elevations with seaming layout.
D. Samples: Submit two samples of covering, 12 x 12 inch in size illustrating color, finish, and texture.
E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.
F. Manufacturer’s Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 SUBMITTALS AT PROJECT CLOSEOUT
A. Section 01 77 00 – Project Closeout: Procedures for submittals.
B. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

1.6 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
C. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.
1.7 REGULATORY REQUIREMENTS
   A. Conform to applicable code for flame and smoke ratings of 25/25 when tested to ASTM E84.

1.8 MOCK-UP
   A. Section 01 40 -0 - Quality Requirements: Requirements for mock-up.
   B. Provide panel, 9 feet wide, full height, illustrating installed covering, joint seaming technique, and trimmed edges.
   C. Locate where directed.
   D. Approved mock-up may remain as part of the Work.

1.9 DELIVERY, STORAGE, AND PROTECTION
   A. Section 01 60 00 - Material and Equipment: Transport, handle, store, and protect products.
   B. Inspect roll materials on site to verify acceptance.
   C. Protect packaged adhesive from temperature cycling and cold temperatures.
   D. Do not store roll goods on end.

1.10 ENVIRONMENTAL REQUIREMENTS
   A. Section 01 60 00 - Material and Equipment: Environmental conditions affecting products on site.
   B. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or vinyl covering product manufacturer.
   C. Maintain these conditions 24 hours before, during, and after installation of adhesive and covering.
   D. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

1.11 EXTRA MATERIALS
   A. Section 01 77 00 – Project Closeout.
   B. Supply 25 linear feet of each color and pattern of covering; store where directed.
   C. Package and label each roll by manufacturer, color and pattern, and destination room number.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Koroseal Wallcoverings, a division of RJF International Corporation.
      1. Substitutions: In accordance with Section 01 60 00 - Material and Equipment.

2.2 MATERIALS
   A. Vinyl Wall Covering: Medium Duty, Type II, vinyl coated fabric roll stock, micro-vented perforated, conforming to the following:
      1. Total Weight: Not less than 21 oz/lin yd. (14 oz/sq yd).
2. Vinyl Finish Weight: Not less than 18 oz/lin yd.
3. Roll Width: 54 inches.
5. Antimicrobial Treatment: Wallcovering shall be treated to resist the growth of mildew and bacteria.
6. Product: Muratone; as manufactured by Koroseal Wallcoverings.
7. Micro-venting Perforations: All vinyl wallcovering shall be “Micro-Venting” perforated by Perforating Industries, Inc. or equivalent prior to shipment to jobsite. Provide certification that vinyl wall covering provided for this project has received “micro-venting” perforation.

B. Adhesive: Type recommended by covering manufacturer to suit application to substrate and containing mildew inhibitors.

C. Substrates: Gypsum Wallboard as specified in Section 09 21 16.
   1. Substrate Filler: As recommended by adhesive and covering manufacturers; compatible with substrate.

D. Substrate Primer and Sealer: Alkyd enamel type.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Section 01 26 00 - Coordination and Meetings: Verification of existing conditions before starting work.
B. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the covering manufacturer.
C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply coverings unless moisture content of surfaces are below the following maximums:
D. Plaster and Gypsum Wallboard: 12 percent, measured in accordance with ASTM D4442.
E. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.2 PREPARATION
A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
B. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
C. Surfaces: Correct defects and clean surfaces which affect work of this section.
D. Marks: Seal with shellac those which may bleed through surface finishes.
E. Apply primer sealer to substrate surfaces to manufacturer's recommended coverage. Allow to dry. Lightly sand smooth.
F. Vacuum clean surfaces free of loose particles.

3.3 INSTALLATION
A. Apply adhesive and covering in accordance with manufacturer's instructions.
B. Apply adhesive to covering surface immediately prior to application of covering.
C. Wrap covering along edge of substrate. Ensure that edge is fully adhered.
D. Use covering in roll number sequence.
E. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
F. Apply covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tight.
G. Horizontal seams are not acceptable.
H. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
I. Install covering before installation of bases, cabinets, hardware, perimeter trim, or items attached to or spaced slightly from wall surface. Do not install covering more than 1/4 inch below top of resilient base.
J. Cover spaces above and below windows, above doors, in pattern sequence from roll.
K. Where covering tucks into reveals, or metal wallboard or plaster stops, apply covering with contact adhesive within 6 inches of covering termination. Ensure full contact bond.
L. Remove excess adhesive while wet from seam before proceeding to next covering sheet. Wipe clean with dry cloth.

3.4 CLEANING
A. Section 01 77 00 - Contract Closeout: Cleaning installed work.
B. Clean coverings of excess adhesive, dust, dirt, and other contaminants.
C. Reinstall wall plates and accessories removed prior to work of this section.

3.5 PROTECTION OF FINISHED WORK
A. Section 01 77 00 - Contract Closeout: Protecting installed work.
B. Do not permit work at or near finished covered areas.

3.6 SCHEDULE
A. Tackable Wall Surface 1 (TWS-1 as noted on Drawings): Vinyl wallcovering direct-adhered to gypsum wallboard partition.

END OF SECTION
SECTION 09 99 50
FINISH / COLOR SCHEDULE

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED
A. Selection of interior and exterior colors and finishes.

1.2 RELATED REQUIREMENTS
A. As specified in Sections references.

1.3 SUBMITTALS
A. The submittals for products identified in this Section must be made at the same time for the purpose of color coordination. The Architect reserves the right to hold any and all submittals for products listed in this section until all submittals for products identified below have been received.

PART 2 - COLOR SELECTIONS

2.1 GENERAL
A. Color selections referenced to specific products are for the purposes of identifying color only. Other products exhibiting the same color, finish, and texture are acceptable if they conform to the requirements of the Specification for that product.

2.2 SECTION 06 41 00 – CUSTOM CASEWORK
A. Hardwood Veneer:

B. Plastic Laminate Countertops (post-formed):
   1. Shall be selected by the Architect from one of the manufacturers listed in Section 06 41 00 from manufacturer’s complete range of solids, wood grains, matrix and patterns.

2.3 SECTION 07 92 00 – JOINT SEALANTS
A. Color as selected by Architect in the field.
B. Submit for approval colors for all locations including those not noted herein.

2.4 SECTION 08 11 13 – STANDARD STEEL DOOR AND FRAMES
A. Doors and Frames: Paint as scheduled; color as selected by Architect.

2.5 SECTION 08 14 16 – FLUSH WOOD DOORS
A. Doors: Select White Birch, color as selected by Architect.

2.6 SECTION 09 30 00 – TILE
A. Ceramic Wall Tile: 4 1/4" x 4 1/4" (Colors noted are intended as the basis for pricing only. Actual colors will be selected by Architect as part of the submittal process.)
   1. CWT-1 -Daltile, 4 ¼" x 4 ¾” semi-gloss wall tile – K165 Almond.
2. **CWT-2** - Daltile, 4 ¼” x 4 ¼” semi-gloss wall tile accent: Price Group 3 (5 percent of wall surface).
3. **CWT-3** - Daltile, 4 ¼” x 4 ¼” semi-gloss wall tile accent: Price Group 3 (5 percent of wall surface).

B. Ceramic Floor Tile: 2” x 2” Keystones
   1. **CFT-1**: Daltile, Urban Putty Speckle D201.

2.7 **SECTION 09 51 10 – SUSPENDED ACOUSTICAL CEILINGS**

A. Ceiling Panels
   1. **AT-1**: Armstrong, Fine Fissured #1729; 24 inch by 48 inch by 5/8 inch, White
   2. Provide Armstrong Fissured #755, 24 x 48 inch where matching panels in existing rooms.
   3. Grid: 15/16 inch; white.

2.8 **SECTION 09 65 00 – RESILIENT FLOORING**

A. Flooring (Colors noted are intended as the basis for pricing only. Actual colors will be selected by Architect as part of the submittal process.)
   1. **VCT-1**: Armstrong “Standard Excelon” – 51858 Sandrift White
   2. **VCT-2**: Armstrong “Standard Excelon” – 51814 Pomegranate Red
   3. **VCT-3**: Armstrong “Standard Excelon” – 51882 Serene Blue
   4. **VCT-4**: Armstrong “Standard Excelon” – 51946 Gentian Blue

B. Rubber Base (**RB**): Roppe, 4” Vulcanized SBR Rubber.

2.9 **SECTION 09 95 53 - WALL COVERINGS**

A. **VWC – 1**: Koroseal, Muratone; as selected by Architect from complete range of color and textures.

2.10 **SECTION 09 91 00 – PAINTING**

A. Paint, color, finish and texture.
   1. **P-1**: To match Sherwin Williams, SW6119 Antique White
   2. **P-2**: To match Sherwin Williams, SW6244 Naval
   3. **P-3**: As selected by Architect.
   4. **P-4**: As selected by Architect

2.11 **SECTION 10 11 00 – VISUAL DISPLAY BOARDS**

A. Markerboards: White.

B. Tackboards: To be selected by Architect from manufacturer’s available colors.

2.12 **SECTION 10 14 23 - PLASTIC SIGNS**

A. Room Number and Room Description Signage
   1. Face: To be selected by Architect
   2. Core: To be selected by Architect

2.13 **SECTION 12 21 13 – HORIZONTAL LOUVER BLINDS**

A. Horizontal Blinds: Alabaster No. 112.

**END OF SECTION**
SECTION 10 11 00
VISUAL DISPLAY BOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes markerboards and tackboards.

B. Related Sections:
   1. Section 04 20 00 – Unit Masonry Assemblies. Substrate construction.
   2. Section 06 10 00 – Rough Carpentry: Wood Blocking.
   3. Section 09 22 16 – Non-Structural Metal Framing.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A135.4 - Basic Hardboard.

B. ASTM International:
   2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. Federal Specification Unit:
   1. FS CCC-W-408 - Wall Covering, Vinyl-Coated.
   2. FS L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride).

D. PEI (Porcelain Enamel Institute):
   1. Performance Specifications for Porcelain Enamel Chalkboards.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate wall elevations, dimensions, and joint locations, and special anchor details.

C. Product Data: Submit data on markerboards, tackboards, tackboard surface covering, and trim and accessories.

D. Samples: Submit two inch in size illustrating materials and finish, color and texture of markerboard, chalkboard and trim, tackboard, and tackboard surfacing.
1.4 CLOSEOUT SUBMITTALS
   A. Section 01 77 00 – Project Closeout: Closeout procedures.
   B. Operation and Maintenance Data: Submit Operation and Maintenance Data.

1.5 QUALITY ASSURANCE
   A. Conform to applicable code for flame/smoke rating of for vinyl fabric covered tackboards in accordance with ASTM E84.

1.6 QUALIFICATIONS
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.7 FIELD MEASUREMENTS
   A. Verify field measurements prior to fabrication.

1.8 WARRANTY
   A. Section 01 7700 – Project Closeout: Product warranties and product bonds.
   B. Furnish five year manufacturer warranty for visual display boards.
   C. Warranty: Include coverage of chalkboard and markerboard surface from discoloration due to cleaning, crazing or cracking, staining.

PART 2 - PRODUCTS

2.1 VISUAL DISPLAY BOARDS
   A. Manufacturers:
      1. Claridge Products and Equipment. Note: Part numbers are Claridge unless otherwise noted.
      2. AARco Products, Inc.
      5. Polyvision.
      6. Substitutions: Section 01 60 00 – Materials and Equipment.

2.2 COMPONENTS
   A. Sheet Steel: ASTM A424, Type I, commercial quality.
   B. Cork: Fine grain natural cork, homogeneous composition.
   C. Tackboard Covering: FS CCC-W-408; Type II - medium; Class 2 - mildew resistant; color as selected.
   D. Plywood: APA Structural I, Grade C-D fir species.
E. Hardboard: ANSI A135.4, tempered, smooth face.
F. Fiberboard: High density; moisture resistant.
G. Particle Board: Not permitted.
H. Foil Backing: Aluminum foil sheet, 0.015 inch thick.
I. Frame and Chalkrail: Aluminum extrusions, ASTM B221, 6061 alloy, temper.

2.3 ACCESSORIES
A. Adhesives: Type used by manufacturer.
B. Map Supports: Formed aluminum sliding hooks to fit map rail.
C. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.
D. Flag Holders: Cast aluminum bored to receive flag staff, bracketed to fit top rail of markerboard. Provide two flag holders per markerboard.
E. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on metal plate fastened to perimeter frame near chalkrail.

2.4 FABRICATION
A. Markerboards - General:
   1. Outer Face Sheet: Porcelain enamel on 24 gage steel.
   2. Core: High density moisture resistant fiberboard or dual layer hardboard, 1/2" thick. Note: Use of particleboard is not permitted.
   3. Backing Surface: Aluminum sheet, 0.015 inch thick.
B. Markerboard Unit:
   1. Series: 3.
   2. Writing Surface: 24 gauge steel LCS markerboard.
   3. Unit Size: 6 foot long x 4 foot high.
   4. Arrangement: As indicated on Drawing. Include map rail, chalkrail, concealed fasteners and accessories as scheduled for markerboards.
C. Tackboards:
   1. Unit Size: 4 foot long x 4 foot high.
   2. Outer Facing: Claridge "Fabricork" vinyl fabric on, or approved equal.
   3. Core: 1/4 inch thick cork on 1/4 inch thick hardboard.
   4. Backing Surface: Aluminum sheet, 0.015 inch thick.
D. Aluminum Frame: Series 3 profile, 1-1/4 inch perimeter trim; concealed fasteners, map rail with cork insert over markerboard surfaces.
E. Aluminum Chalkrail: Manufacturer’s standard continuous, hollow type with ribbed section and metal end closures; one piece full length of chalkboard, concealed fasteners.
2.5 FACTORY FINISHING

A. Porcelain Enamel: Glass fibered enamel, baked to vitreous surfaces; Porcelain Enamel Institute Type A; color as selected by Architect from full range of manufacturer’s available colors.

B. Tackboard Surface: Vinyl fabric; color as selected by Architect from manufacturer’s standard range.

C. Aluminum Frame, Chalkrail, and Accessories: Anodized to clear satin finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify internal wall blocking is ready to receive Work and positioning dimensions are as indicated on shop drawings. instructed by manufacturer.

C. Verify flat wall surface for frameless adhesive applied type.

3.2 INSTALLATION

A. Establish top of chalk rail at height as indicated on Drawings.

B. Secure units level and plumb.

3.3 CLEANING

A. Section 01 77 00 – Project Closeout: Final cleaning.

B. Cover chalkboard surfaces with protective cover, taped to frame.

C. Remove temporary protective cover at date of Substantial Completion.

END OF SECTION
SECTION 10 21 23
CUBICLE CURTAIN AND TRACK

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Overhead metal curtain track and guide.
B. Curtains.

1.2 RELATED SECTIONS
A. Section 09 51 10 - Suspended Acoustical Ceilings: Suspended ceiling system to support track.

1.3 REFERENCES
A. NFPA 701 - Fire Tests for Flame Resistant Textiles and Films.
B. UL (Underwriters Laboratories, Inc.) - Flammability Test 214.

1.4 SYSTEM DESCRIPTION
A. Track: Surface mounted.

1.5 PERFORMANCE REQUIREMENTS
A. Track: Support vertical test load of 50 lbs without visible deflection of track or damage to supports.
B. Track Size: Safely support moving loads.
C. Track and Mounting: Sufficiently rigid to resist visible deflection and without permanent set.

1.6 SUBMITTALS
A. Submit under provisions of Section 01 33 00.
B. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
C. Product Data: Provide data for curtain fabric characteristics.
D. Samples: Submit two fabric samples, 6 x 6 inch in size illustrating fabric color.
E. Submit 12 x 12-inch sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.
F. Submit 12-inch sample length of curtain track including typical splice and wall and ceiling hanger and escutcheon.
G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.7 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates: Certify recycled material content for recycled content products.

1.8 MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00.

B. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

1.9 REGULATORY REQUIREMENTS

A. Conform to applicable code and NFPA 701 for flame/smoke rating requirements for flame resistant material in accordance with ASTM E84 for curtain fabric.

1.10 MOCKUP

A. Provide mockup of curtain, track and accessories under provisions of Section 01 40 00.

B. Provide complete section mockup, with curtain track, curtain, cords and accessories.

C. Locate where directed.

D. Approved mockup may remain as part of the Work.

1.11 DELIVERY, STORAGE, AND HANDLING

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

B. Accept curtain materials on site and inspect for damage.

C. Store curtain materials on site and deliver to the Owner for installation when requested.

1.12 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.13 EXTRA MATERIALS

A. Furnish under provisions of Section 01 77 00.

B. Provide five extra carriers.
PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Pryor Products; Model.
B. General Cubical Co.
D. Substitutions: Under provisions of Section 01 600.

2.2 TRACK MATERIALS
A. System: Surface mounted system for ceiling height curtains.
B. Track: Extruded aluminum sections; #6063-T4, T5 alloy, one piece per cubicle track run, where possible.
C. Track End Stop: To fit track section.
D. Curtain Carriers: Nylon roller to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; 2.3 carriers per lineal foot of track length.
E. Wand: Plastic hollow section, attached to lead carrier, for pull-to-close action.

2.3 CURTAIN MATERIALS
A. Curtain: 100% polyester, 15 oz./lin. yd.; anti-bacterial, self deodorizing, sanitized, preshrunk, flame-resistant to NFPA 701.
B. Curtain: Color selected from manufacturer's standard range.
C. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain.

2.4 FINISHING
A. Exposed Surfaces: Clear anodized finish.

2.5 FABRICATION
A. Manufacture curtains of one piece, sized 10 percent wider than track length. Terminate curtain 15 inches from floor.
B. Include open mesh cloth at top 21 inches of curtain for room air circulation.
C. Curtain Heading: Triple thickness 2 inches wide, with metal grommet holes for carriers 6 inches on center, double fold bottom hem 2 inches wide. Lock stitch seams in two rows. Turn seam edges and lock stitch.
D. Fabricate track bend with minimum 12 inch radius, without deforming track section, or 
impeding movement of carriers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and above ceiling supports are ready to receive work.

3.2 INSTALLATION

A. Install curtain track secure and rigid, true to ceiling line.
B. Install end caps.
C. Secure track to ceiling system.
D. Install curtains on carriers ensuring smooth operation.

END OF SECTION
SECTION 10 26 13
CORNER GUARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Corner guards.

1.2 RELATED SECTIONS
A. Section 09 22 16 - Non-structural metal framing.
B. Section 09 21 16 - Gypsum Wallboard Systems: Wall construction.

1.3 PERFORMANCE REQUIREMENTS
A. Installed Component Assembly: Class 1 fire rating with impact resistance of 16 ft. lbs/in. minimum in accordance with ASTM D 256.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 33 00.
B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
C. Samples: Submit two sections of corner guard, 24 inch long, illustrating component design, configuration, color and finish.
D. Manufacturer’s Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE
A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 FIELD MEASUREMENTS
A. Verify that field measurements are as instructed by the manufacturer.

1.7 COORDINATION
A. Coordinate work under provisions of Section 01 26 00.
B. Coordinate the work with wall or partition sections for installation of concealed blocking or anchor devices.
PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. American Floor Products Company, Inc. (AFCO); Space (CG-2145).
B. Construction Specialties, Inc.; Acrovyn LG Series, LG-250.
D. Substitutions: Under provisions of Section 01 60 00.

2.2 COMPONENTS
A. Corner Guard - Surface Mounted: 2 1/2 x 2 1/2 inch for 90 and 135 degree corners:
   1. Material: 0.125-inch nominal clear polycarbonate resin.
   2. Length: 96 inches; one piece.
B. Attachment Hardware: Countersunk chrome-plated or stainless steel screws.

2.3 FABRICATION
A. Fabricate components with uniform corners and edges.
B. Pre-drill holes for attachment to wall.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify site conditions under provisions of Section 01 26 00.
B. Verify that rough-in for components are correctly sized and located.
C. Verify actual height of base.

3.2 INSTALLATION
A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
B. Position corner guards 4 inches above finished floor to 8’-4” inches high.

3.3 SCHEDULE
A. Provide corner guards at all external corners of gypsum wallboard partitions in the Administrative area.

END OF SECTION
SECTION 10 28 13
TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Toilet room accessories.

B. Accessories at custodial closets, utility rooms and sinks.

C. Related Sections:
   1. Section 04 20 00 – Unit Masonry Assemblies.
   2. Section 06 10 00 – Rough Carpentry: In-wall framing and plates for support of accessories.
   3. Section 08 81 00 – Glazing: Other mirrors.
   4. Section 09 30 00 – Tile.

1.2 REFERENCES

A. American Society for Testing and Materials:
   3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   4. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

B. Federal Specification Unit:

C. Accessibility Guidelines:
   1. ADAAG – Americans With Disabilities Act Accessibility Guidelines.
   2. TAS – Texas Accessibility Standards.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, attachment methods.

C. Samples: Submit two samples of each accessory, illustrating color and finish.

D. Manufacturer's Installation Instructions: Submit special procedures, conditions requiring special attention.
1.4 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

PART 2 - PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

A. Manufacturers - General:
   1. Bobrick Washroom Equipment (BWE).
   2. Bradley Corporation.
   3. Charles Parker Company
   4. Kimberly-Clark (KC)
   5. Truebro Inc.
   6. Koala Care (Koala).
   7. Substitutions: Section 01 60 00 - Product Requirements.

B. Manufacturers – Miscellaneous:
   1. Ives
   2. Rockwood
   4. Scott Paper Company (SPC).
   5. Trimco

C. Manufacturers – Hand Dryers:
   1. World Dryer Corp. (WDC).

2.2 COMPONENTS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Keys: Furnish five keys for each accessory to Owner. Master key all accessories.

C. Stainless Steel Sheet: ASTM A666, Type 304.

D. Stainless Steel Tubing: ASTM A269, stainless steel.

E. Galvanized Sheet Steel: ASTM A653, G90 zinc coating.

F. Mirror Glass: Float glass, Type I, Class 1, Quality q2 (ASTM C 1036), with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with FS A-A-3002.

G. Adhesive: Contact type, waterproof.
H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.

I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FACTORY FINISHING

A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, Type SC 2, satin finish, unless otherwise noted.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

D. Galvanizing for Items other than Sheet: ASTM A123/A123M to 1.25 oz/sq yd. Galvanize ferrous metal and fastening devices.

E. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

F. Back paint components where contact is made with building finishes to prevent electrolysis.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify exact location of accessories for installation.

C. Verify field measurements are as indicated on product data.

D. See Sections 04 20 00 and 06 10 00 for installation of blocking, reinforcing plates and concealed anchors in walls and ceilings.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

A. Install plumb and level, securely and rigidly anchored to substrate.

B. Mounting Heights and Locations: As required by accessibility regulations and manufacturer’s instructions.
### 3.4 SCHEDULE

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
<th>Model No.</th>
<th>Mfg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA-1</td>
<td>Mirror - stainless steel frame, concealed wall hangers; width and height indicated on drawings</td>
<td>B-290</td>
<td>BWE</td>
</tr>
<tr>
<td>TA-2</td>
<td>Grab Bar, 42 inch - satin finish, concealed mounting, snap flange</td>
<td>B-6806x42</td>
<td>BWE</td>
</tr>
<tr>
<td>TA-3</td>
<td>Grab Bar, 36 inch - satin finish, concealed mounting, snap flange</td>
<td>B-6806x36</td>
<td>BWE</td>
</tr>
<tr>
<td>TA-4</td>
<td>Paper Towel Dispenser; surface mounted, lever roll type</td>
<td>#09736</td>
<td>KC</td>
</tr>
<tr>
<td>TA-5</td>
<td>Toilet Paper Dispenser dual roll, lockable; padlock by Owner</td>
<td>TP-2</td>
<td>RRR</td>
</tr>
<tr>
<td>TA-6</td>
<td>Undersink Protective Cover</td>
<td>Laveguard 2</td>
<td>Truebro</td>
</tr>
<tr>
<td>TA-7</td>
<td>Soap Dispensers</td>
<td>Owner-Furnished/Owner-Installed</td>
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</tbody>
</table>
SECTION 10 40 41
PLASTIC SIGNS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Room identification signs, interior and exterior locations.
B. Partition Labeling at fire rated or smoke resistive partitions

1.2 RELATED SECTIONS
A. Section 10 40 43 – Building Letters and Plaque.
B. Division 15 – Mechanical Identification.
C. Division 16 – Electrical Identification.

1.3 REFERENCES
B. ADAAG - Americans with Disabilities Act Accessibility Guidelines.
D. California Department of Health Services:
E. South Coast Air Quality Management District:
   1. SCAQMD Rule 1113 - Architectural Coatings.
   2. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

1.4 REGULATORY REQUIREMENTS
A. Conform to ADAAG, TAS and ANSI A117.1 for requirements for the physically handicapped.

1.5 QUALITY ASSURANCE
A. Supplier must be in business for minimum of two (2) years making comparable products and be able to provide references upon request.
B. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 SUBMITTALS
A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
B. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.

C. Samples: Submit two signs, full size illustrating type, style, letter font, and colors specified; method of attachment.

D. Manufacturer's Installation Instructions: Submit installation template and attachment devices.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
B. Package signs, labeled in name groups.
C. Store adhesive attachment tape at ambient room temperatures.

1.8 ENVIRONMENTAL REQUIREMENTS
A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
B. Maintain this minimum temperature during and after installation of signs.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers:
   1. ASI Signage Innovation, 8181 Jetstar Drive, Suite 100, Irving, Texas 75063; (214) 352-9140 telephone.
   2. 3D Signedge.
   3. Substitutions: Refer to Section 01 60 00.

2.2 RAISED LETTER SIGNS
A. Tactile Graphics and Text:
   1. Fabrication process: Provide tactile copy and grade 2 Braille raised 1/32 inch minimum from plaque first surface by manufacturer's photopolymer bonded process. Sign face of single material, tactile characters and Braille integral to photopolymer. Adhesive-fixed characters are not acceptable.
   2. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors. Tactile characters to be raised min. 1/32” from surface. Computerized translation of sign copy to be responsibility of the manufacturer.

B. As an option to Fabrication process, Manufacturer may provide direct print process on substrate which meets the requirements listed in 2.2.C.

C. Raised messages shall consist of construction containing the following:
   1. Raised Tactile Grade 2 Braille shall be integral with the sign face and be raised 1/32 inch. Glass or metallic rasters to have 0.059 surface diameter with body of sphere pressure secured below face laminate. Glued on dots will NOT be acceptable.
   2. Raised symbols shall be as indicated on Drawings, raised 1/32 inch from sign face and unitized with the sign core.
   3. All raised lettering shall be 5/8 inch high (min.), raised 1/32 inch and be integral with the sign face; letter style to be Helvetica Medium or Helvetica Regular Condensed where required to fit and complying with TAS Standards.
4. All lettering shall be upper case.
5. All copy (lettering, numbering and symbols) shall have a contrast with their background and have Egg Shell matte finish.

D. Provide signs with clear acrylic lense window for changeable message where scheduled.

2.3 FABRICATION – GENERAL
A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
B. Preassemble signs in the shop to the greatest extent possible to minimize field assembly. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in a location not exposed to view after final assembly.
C. Conceal fasteners if possible; otherwise, locate fasteners to appear inconspicuous.
D. Form panels to required size and shape. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.
E. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.
F. Manufacturing process shall be in conformance with provisions of the TAS and ADA.

2.4 ACCESSORIES
A. Tape Adhesive: Double sided tape, permanent adhesive.
B. Screws: Flat head, countersunk, tamper-proof type; pre-painted to match background color of sign.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify that substrate surfaces are ready to receive Work.

3.2 INSTALLATION
A. Install in accordance with manufacturer’s instructions.
B. Install signs after surfaces are finished, in locations scheduled.
C. Locate sign on wall surface, level, mounted 60 inches above finished floor.
D. Attach with tape adhesive and mechanically fasten with one screw in each corner of sign.

3.3 SIGNAGE SCHEDULE
A. Refer to SIGNAGE SCHEDULE on the Drawings for signage nomenclature and numbering.
B. Refer to Drawings sign types and locations.
C. Partition Labeling: All Fire Rated or Smoke Resistive Partitions: Label in accordance with IBC section 707.3 on each side above ceilings and in areas open to structure. Size: 3 inch letters with 3/8” stroke. Lettering shall be painted stenciled or other permanent mounted signage.
1. Example: 1 HOUR FIRE WALL- SEAL ALL PENETRATIONS

END OF SECTION
SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Portable fire extinguishers.
B. Fire extinguisher cabinets.

1.2 QUALITY ASSURANCE
A. Source Quality Control: Furnish portable fire extinguishers and accessories from only one manufacturer.
B. Requirements of Regulatory Agencies: Provide only portable fire extinguishers that are approved and labeled by UL in accordance with the 2018 International Building Code.
C. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified.
   1. UL, Fire Classification Rating.
   2. NFPA 10 - Portable Fire Extinguishers.

1.3 SUBMITTALS
A. Submit product data under provisions of Section 01300.
B. Submit copies of manufacturer's technical data, certification of UL rating and installation instructions for all portable fire extinguishers required.

1.4 COORDINATION
A. Coordinate Work under provisions of Section 01040.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS
A. Potter-Roemer.
B. Larsen's Manufacturing Co.
C. J. L. Industries.
D. Substitutions: Under provisions of Section 01600.

2.2 FIRE EXTINGUISHER CABINETS
A. Manufacturer:
   1. Potter-Roemer; Series 7000 Alta Series Cabinet; Model No. FRC7012.
   2. Larsen’s Manufacturing Co.; Architectural Series Cabinet; Model No. FS 2409-5R.
   3. J. L. Industries; Ambassador Series Cabinet; Fire rated option.
B. Construction:
   1. Two-hour, semi-recessed cabinets: 
   2. Door and Trim: Door with center break glass panel; cam lock; 1-1/2 inch; 2 inch max. projection.
   3. Cabinet Box: Cold rolled steel with integral insulationl, heavy gauge, with white baked enamel finish.

2.3 FIRE EXTINGUISHERS
A. Fire Extinguisher Type 1: Multi-purpose Dry Chemical; 5 pound capacity, UL rating 2A-10B:C.
   1. Manufacturers:
      a. Potter-Roemer; Model 3005.
      b. Larsen’s Manufacturing Co; MP5.
      c. J. L. Industries; Cosmic 5E.

PART 3 - EXECUTION

3.1 INSPECTION
A. Examine conditions under which the portable fire extinguisher Work is to be installed, and notify the Architect in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION
A. Install items included in this Section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
   1. In locations indicated on Drawings as "F.E.C.", provide fire extinguisher and cabinet.
B. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
C. Fit cabinet trim to wall surfaces.
D. Check extinguishers for proper charge and operation.
E. Remove and replace damaged, defective or undercharged units.

3.3 SCHEDULE
A. Provide each location indicated on Drawings with Fire Extinguisher Type 1.

   END OF SECTION
SECTION 10 75 00
FLAGPOLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Aluminum flagpoles, ground mounted.

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-In-Place Concrete: Concrete base and foundation construction.

1.3 REFERENCES

A. AASHTO M-36 - Corrugated Metal Culvert Pipe.
C. CDA (Copper Development Association) - Handbook.

1.4 PERFORMANCE REQUIREMENTS

A. Flagpole With Flag Flying: Resistant without permanent deformation (when flying two flags) to 100 miles/hr wind velocity; non-resonant, safety design factor of 2.5.

1.5 QUALITY ASSURANCE

A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.6 SUBMITTALS

A. Submit under provisions of Section 01 33 00.
B. Shop Drawings: Indicate detailed dimensions, base attachment details, anchor requirements, and imposed loads.
C. Product Data: Provide data on pole, accessories, and configurations.
D. Samples: Submit two samples 2 x 2 inch in size illustrating pole material, color, and finish.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00.
B. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.
1.8 QUALIFICATIONS
   A. Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Texas.

1.9 DELIVERY, STORAGE, AND HANDLING
   A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
   B. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
   C. Protect flagpole and accessories from damage or moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. American Flagpole.
   B. Acme Flagpole.
   C. Concord Industries.
   D. Eder Flag Manufacturing Company.
   E. Boortol Company, Inc.
   F. John Ewing and Company.
   G. Pole Tech, Inc.
   H. Substitutions: Under provisions of Section 01 60 00.

2.2 POLE MATERIALS
   A. Aluminum: ASTM B241, 6063 alloy, T6 temper.

2.3 POLE CONFIGURATION
   A. Outside Butt Diameter: 6 inches.
   B. Outside Tip Diameter: 3 1/2 inches.
   C. Nominal Wall Thickness: .188 inch.
   D. Nominal Height: 30 ft; measured from top of base.
   E. Flagpole: Ground mounted type.
   F. Flagpole Design: Cone tapered.
   G. Halyard: External type.
2.4 COMPONENTS AND ACCESSORIES

A. Finial Ball: Aluminum, 6 inch diameter.

B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings and nylon sheaves, non-fouling.

C. Cleats: 9 inch size, aluminum with stainless steel fastenings, two per halyard.

D. Halyard: 5/16 inch diameter cotton, braided, with steel or bronze core; equip with aluminum swivel snaps to secure two flags.

E. Collar: Aluminum; manufacturer's standard.

2.5 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M-36, corrugated 16 gage steel, galvanized, depth as required to meet design performance requirements; welded steel bottom plate and support plate.

B. Pole Base Attachment: Sleeve; with base cover.

C. Lighting Ground Rod: 3/4 inch diameter, 18 inch long copper rod.

D. Miscellaneous Components: Steel centering wedges, wood wedges, sand, sealant, etc.

2.6 FINISHES

A. Metal Surfaces in Contact With Concrete: Asphaltic paint.

B. Aluminum: Anodized to color; directional satin ground.

C. Finial: Spun anodized finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 26 00.

B. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.2 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.3 INSTALLATION

A. Install flagpole, base assembly, centering wedges and fittings in accordance with manufacturer's instructions.
B. Electrically ground flagpole installation.

C. Fill foundation tube sleeve with dry sand and compact.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1 inch.

3.5 ADJUSTING

A. Adjust work under provisions of Section 01 77 00.

B. Adjust operating devices so that halyard functions smoothly.

3.6 SCHEDULE

A. Provide one flag pole capable of flying two flags.

END OF SECTION
PART 1 - GENERAL

1.1 EXTENT OF WORK
A. Provide miscellaneous specialty items as shown on the Drawings and specified herein:
   2. Paper Towel Dispensers.

1.2 RELATED WORK
A. Section 04 20 00 – Unit Masonry Systems.
B. Section 09 21 16 – Gypsum Wallboard Systems.
C. Section 09 51 10 – Suspended Acoustical Ceilings.
D. Section 11 52 13 – Projection Screens.

1.3 MEASUREMENTS
A. Verify all dimensions shown on Drawings by taking field measurement; proper fit and attachment of all parts is required.

1.4 ANCHORAGE
A. Furnish and install all anchorage devices required to install the item and its appurtenances complete. Provide anchorage in ample time when required to be built in by other trades.

1.5 SUBMITTALS
A. Provide manufacturer's data and installation instructions and details, including applicable dimensions.

1.6 QUALITY ASSURANCE
A. Provide items which are products of a single manufacturer. Furnish each item complete with screws, bolts, clips and similar accessory parts which are essential to proper servicing and operation.
B. Location: Coordinate miscellaneous specialty item locations to avoid interference with other Work and to assure proper servicing and operation.
C. Appearance: Provide units which are without blemish or damage, and without stamped names or labels in conspicuous locations.
D. Coordination: Assure that the Work is coordinated in a timely manner with the Work of other trades. Provide blocking and concealed reinforcement as required to rigidly support installations. Provide templates to assure correct installation.
E. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.
PART 2 - PRODUCTS

2.1 AUDIO-VISUAL EQUIPMENT MOUNTING SYSTEMS

A. Overhead Projection Ceiling Plate (Contractor-Furnished, Contractor-Installed): CMJ500R1 Suspended Ceiling Kit as manufactured by Peerless or approved equal.
   1. Kit shall include 8 by 24 inch filler tray and 15-3/4 by 24 inch ceiling tray suspended by four tie wires from structure above.
   2. Provide safety cable, strand wire, turnbuckles, and outlet knockouts as required in Division 16.
   3. Support ceiling plate at each corner.
   4. Installation of Owner-provided overhead projector shall be by Others.

B. Overhead Projector Mount Accessories:
   1. Truss Ceiling Adapter: Model ACC 557; black.
   2. Structural Ceiling Plate: Model CMJ 310; 8 by 8 inch; black.
   3. Extension Columns: 1-1/2 inch O.D. length to suit application; black
   5. Attachment Hardware: Hanger clamps, bolts, screws to suit application.

2.2 PAPER TOWEL DISPENSERS

A. Paper Towel Dispenser; surface mounted, lever roll type.

B. Model: #09736 as manufactured by Kimberly Clarke, or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.2 INSTALLATION

A. Install miscellaneous specialties in compliance with manufacturer's instructions, plumb and level or otherwise properly aligned.

B. All anchorage screws, bolts and/or set screws shall be fully tightened and accessories shall be rigidly supported. Use fasteners which are appropriate for the substrate and as recommended by the manufacturer.

C. Install ceiling plates above ceiling at locations indicated on Drawings for projectors. Verify exact location with Owner's Representative prior to installation. Center of projector mount shall be centered on projection screen.

D. Mounting heights and locations: As required by accessibility regulations and manufacturer's instructions.

3.3 CLEANING

A. Prior to final inspection clean exposed surfaces as recommended by the manufacturer.

END OF SECTION
SECTION 11 52 13
PROJECTION SCREENS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manually operated exposed mounted projection screens.
   2. Related accessories.

B. Related Sections:
   1. Section 03 30 00 – Cast-In-Place Concrete.
   2. Section 04 20 00 – Unit Masonry Assemblies.
   4. Section 09 51 10 – Suspended Acoustical Ceilings.

1.2 REFERENCES


1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer’s product data on materials, finishes, and operation of unit.

C. Samples: Submit two samples in size illustrating screen case prefinished components, and screen surface.

D. Manufacturer’s Installation Instructions: Submit detailed installation instructions including rough-in measurements.

E. Manufacturer’s Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data:
   1. Submit parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   2. Submit technical information for servicing operating equipment.

1.5 QUALITY ASSURANCE

A. Flame Resistant Fabrics: Passes when tested in accordance with NFPA 701, Test 1 or Test 2.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.
1.6 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
B. Installer: Company specializing in performing work of this section with minimum three years’ experience and approved by manufacturer.

1.7 PRE-INSTALLATION MEETINGS
A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING
A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
B. Deliver projection screens after building is enclosed, other work within spaces where screens are to be installed is substantially complete, and installation of screens is ready to take place.
C. Protect projection screens from damage before, during and after installation.

1.9 FIELD MEASUREMENTS
A. Verify field measurements prior to fabrication.

1.10 COORDINATION
A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
B. Coordinate with installation of projector mounts, ceilings, and location.

PART 2 - PRODUCTS

2.1 PROJECTION SCREEN – WALL MOUNTED
A. Manufacturers:
   1. Da-Lite Screen Company, Model B (basis of design).
   2. Draper Inc.
   3. Substitutions: Section 01 60 00 - Product Requirements.
B. Screen Case:
   1. Steel, minimum 21 gage.
   2. Top mounting hooks for hanging from mounting brackets.
C. Screen: (16:10) wide format dimensions; standard matte finish on flame retardant and mildew resistant fiberglass fabric.
   1. Mount on a ball bearing rigid steel spring roller. Fabric shall be permanently attached to roller.
   2. Borders: No masking borders.
D. Mounting Brackets: Prefinished steel angle mounting brackets and fasteners in color as selected.
E. Size: 50” x 80”, unless otherwise indicated on Drawings.
2.2 SCREEN SURFACES
A. Screen: Matte white with minimum gain characteristics; no borders.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
B. Verify exact location of projection screen prior to installation.
C. Verify screen is aligned with projector mount.

3.2 INSTALLATION
A. Install projection screens at location indicated on Drawings.
B. Securely anchor to supporting substrate.
C. Install to produce smoothly operating screen with plumb and straight vertical edges and plumb and flat viewing surfaces when lowered.

3.3 ADJUSTING
A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for balancing and adjusting.
B. Adjust installed unit for smooth and balanced operation.

3.4 CLEANING
A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
B. Remove protective coverings from finished surfaces. Clean surfaces and components ready for inspection.

3.5 DEMONSTRATION
A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.
B. Demonstrate projection screens to Owner.

3.6 PROTECTION OF FINISHED WORK
A. Section 01 40 00 - Quality Requirements: Tolerances.
B. Do not permit use of projection screens after installation.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Horizontal slat louver blinds.
B. Operating hardware.

1.2 RELATED SECTIONS

A. Section 08 41 13 – Aluminum Entrances and Storefronts; exterior windows.

1.3 SYSTEM DESCRIPTION

A. Horizontal slat louver blinds installed at window openings; manual control of raising and lowering by cord for full range locking; blade angle adjustable by control wand.

1.4 QUALITY ASSURANCE

A. Asbestos Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Architect with Certification that the material/product contains no asbestos. This certification is mandatory before approval will be issued. Submittals furnished without the asbestos-free Certification will be returned to the Contractor with no action taken until such Certification is provided.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.
B. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
C. Product Data: Provide data indicating physical and dimensional characteristics and operating features.
D. Samples: Submit two samples, 12 inch long illustrating slat materials and finish, color, rod type and color.
E. Manufacturer’s Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.7 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.
1.8 COORDINATION
   A. Coordinate work under provisions of Section 01 26 00.
   B. Coordinate the work with window installation and placement of concealed blocking to support
      blinds.

1.9 EXTRA MATERIALS
   A. Provide under provisions of Section 01 77 00.
   B. Provide ten additional slats.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Hunter Douglas, Inc., Window Coverings Division; Contract Flexalum Decor.
   B. Levolor Window Treatment Systems.
   C. Springs Window Fashions Division, Inc.; Bali-Graber Contract.
   D. Substitutions: Under provisions of Section 01 60 00.

2.2 MATERIALS
   A. Metal Slats: 1 inch wide; 0.008 inch thick spring tempered pre-finished aluminum horizontal
      slats, square slats with radiused corners, with manufacturing burrs removed.
   B. Slat Support: Ladder configuration, 100 percent polyester yarn of color compatible with slats.
   C. Head Rail: Pre-finished, formed steel box; internally fitted with hardware, pulleys, and
      bearings for operation.
   D. Cord: Two-ply polyester cord filler and braided polyester jacket; continuous loop, free end
      weighted.
   E. Control Wand: Extruded clear acrylic; tubular shape; removable type; length of window
      opening height less 3 inches, but, in all cases, not less than 48 inches to bottom of wand from
      the floor for A.D.A. compliance.
   F. Head Support Bracket: Overhead head rail attachment; Coordinate with Section 08410 for
      installation.
   G. Accessory Hardware: Type recommended by blind manufacturer.

2.3 FINISHES
   A. Blind Slat and Head Rail Housing: Painted solid color; color as selected by Architect from
      manufacturer's full range of colors.
   B. Control Wand: Clear color.

2.4 FABRICATION
   A. Fabricate blinds to fit openings with uniform edge clearance of 1/4 inch.
PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify that openings are ready to receive the work.
B. Ensure structural blocking and supports are correctly placed.

3.2 INSTALLATION
A. Install blinds in accordance with manufacturer's instructions.
B. Secure in place with concealed fasteners.
C. Place intermediate head supports at 60 inch oc.

3.3 INSTALLATION TOLERANCES
A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
B. Maximum Offset From Level: 1/8 inch.

3.4 ADJUSTING
A. Adjust work under provisions of Section 01 77 00.
B. Adjust blinds for smooth operation.

3.5 CLEANING
A. Clean work under provisions of 01 77 00.
B. Clean blind surfaces just prior to occupancy.

3.6 SCHEDULE
A. Install blinds at the following locations:
   1. Administrative area exterior windows installed as part of the Work.

END OF SECTION
SECTION 13 06 50
SPECIAL SECURITY

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. New and reuse of bullet resistant framing system.
B. Reuse of bullet resistant doors.
C. Reuse of bullet resistant baffle transaction window assembly.
D. New and reuse of physical attack resistant glazing.

1.2 RELATED WORK
A. Section 04 20 00 – Unit Masonry: masonry opening; grout filled cells.
B. Section 06 41 00 – Custom Casework; plastic laminate counter tops.
C. Section 07 92 00 – Joint Sealants; perimeter sealants.
D. Section 08 41 13 – Aluminum Storefronts.
E. Section 08 71 00 – Finish Hardware.

1.3 REFERENCES
A. Underwriters Laboratory UL 752-Standard for Bullet Resisting Equipment
C. NIJ Standard 0108.01 - (National Institute of Justice) Standard for Ballistic Resistant Protective Materials
D. ASTM B 209/B 209M- Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate
E. ASTM A 666-Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.

1.4 SUBMITTALS
A. General: Submit in accordance with Section 01 33 00.
B. Product Data:
   1. Submit manufacturer’s descriptive literature and product specifications.
   2. Include information for factory finishes, hardware, accessories, and other required components.
C. Shop Drawings:
   1. Submit shop drawings covering fabrication, installation and finish of specified systems.
   2. Include following:
      a. Fully dimensioned plans and elevations with detail coordination keys.
      b. Locations of exposed fasteners and joints, cuts & anchor spacing, and reinforcement.
      c. Indicate coordination of new components with salvaged components for reuse.
D. Samples:
1. Submit manufacturer’s standard samples indicating quality of finish.
2. Submit actual samples of specified glazing demonstrating ability to provide polished edges for exposed application.

E. Test Reports: Submit certified copies of previous test reports substantiating performance of system including current UL Listing Verification & UL 752 Test Results as provided by Underwriters Laboratories. Include other supportive data as necessary.

F. Qualification Data: Submit installer qualifications verifying years of experience.

G. Manufacturer’s Instructions: Submit manufacturer’s printed installation and cleaning instructions of Bullet Baffle Design Transaction Window Assemblies. All required submittals shall be approved prior to installation.

1.5 DESIGN PERFORMANCE

A. Through the design, manufacturing techniques and material application, the Bullet Baffle Design Transaction Window shall be of the “non-ricochet” type.
1. This design is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.

B. Assembly shall provide single transaction position utilizing the “natural voice” baffle configuration.
1. Design shall employ offset vertical standing vision panels and baffles to complete the “natural voice” design as well as to protect against angled ballistic penetrations.
2. Each transaction position shall have a stainless steel dip tray as shown on the drawings.

C. Components must be manufactured in strict accordance with the specifications, design and details. All vision panels and baffles shall be cut to size with all exposed edges polished. Necessary holes shall be pre-drilled and tapped where required. Stainless Steel assembly screws and acrylic spacers shall be provided. Clear anodized angles and channels shall be provided in field lengths. Coordinate installation of anchor screws.

D. Ballistic and Forced Entry Ratings:
1. UL Level III
2. H.P. White TP-0500.02 Level III (step 25) – Forced Entry
3. H.P. White Level C Ballistics – 44 mag (Low Spall)
4. WMFL Level I – 44 mag & 60 minute Physical Attack

E. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. Standard manufacturing tolerances shall be +/- 1/16".

1.6 QUALITY ASSURANCE

A. Manufacturer shall be a Company that specializes in manufacturing products of the specified type with a minimum of five years experience. Installer shall be a Company that specializes in product type specified and Certified for the installation by the manufacturer.
1.7 DELIVERY, STORAGE & HANDLING
A. Delivery the materials to the project with the manufacturer’s UL Listed Labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations set by manufacturer. Do not install products that are under conditions outside these limits.

1.8 WARRANTY
A. All materials shall be warranted against defects for a period of 1 year for the date of receipt at the project site. Certificates of manufacturer’s standard limited warranty shall be provided at project completion.

PART 2 - PRODUCTS

2.1 GLAZING
A. Glazing Panels: 1-1/4” nominal physical attack resistant, glass-clad polycarbonate, Level III, H.P. White Level C Ballistics – 44 mag (low spall) to match existing glazing panels.

B. Manufacturer (match existing):
1. GCP 1250 as manufactured by U. S. Armor (basis of design).
2. DGCP 1250 as manufactured by Dlubak Corporation.
3. Substitutions: In accordance with Section 01600.

C. Composition: 1/4” clear glass + .050 polyurethane layer + 1/8” polycarbonate + .025 polyurethane layer + 3/8” polycarbonate + .025 polyurethane layer + 1/8” polycarbonate + .050 polyurethane layer + 1/4” clear glass.
1. Composite shall be capable of being buffed to a smooth finish on exposed edges at transaction window.
2. Average Thickness: 1.22 inches.
3. Weight: 10.5 lbs/sq ft.
4. Light Transmission: 79%
5. Glazing Warranty: Five years.

D. Polycarbonate, acrylic, or application of film on the outer surface of either side of glazing is not permitted.

E. Sealants and Setting Blocks: As recommended by Glazing Manufacturer.

2.2 STOREFRONT FRAMING & ENTRANCE SYSTEM
A. Storefront Framing System: UL 752 ballistic standards Level 3; extruded aluminum, 6061-T6 alloy/temper, system to accept glazing as specified.
1. Manufacturer: 44/450 Bullet Resistant Framing System as manufactured by Insulgard Security Products (Basis of Design).
   a. Framing Components: 2-1/2 x 4-1/2 inch profile.
2. Substitutions: Under provisions of Section 01600.

B. Entrance Doors: Existing to be reused. Wide stile; 44/350 Bullet Resistant Door System as manufactured by Insulgard Security Products, or approved equal.
2. Top Rail: 4-1/2 x 2-3/8 inch.
5. Glazing Stops: 1 inch face.
C. Anchorage: No. 12 stainless steel fasteners with self sealing neoprene bonded stainless steel washers. Fastener requirements used in the assembly of aluminum frame components shall be stainless steel type 302 or 304.

D. Finish: Clear anodized aluminum.

2.3 DOOR HARDWARE

A. As scheduled in Section 08 71 00 – Finish Hardware.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to installing the bullet resistive material, the contractor shall verify that all supports have been installed as required by the contract documents and architectural drawings, and approved shop/CAD drawings, if required. Installer shall notify architect of any unsatisfactory preparation that is responsibility of another installer.

B. Grout fill concrete masonry unit cells on transaction window side of lobby extending from entry doors to vestibule doors to a height of six (6) foot above finish floor.

C. Clean and prepare all surfaces per manufacturers recommendations for achieving the best results for the substrate under the project conditions.

3.2 INSTALLATION

A. Do not begin installation until openings have been verified and surfaces properly prepared in accordance with Drawings. Install in accordance with manufacturer’s instructions, and UL and H.P. White requirements.

B. Set all equipment plumb.

C. All products shall be installed per installation instructions provided by manufacturer.

D. Transaction Window shall arrive on site as a completed unit. Unit shall be installed in provided opening and secured to structure.

3.3 POST APPLICATION

A. Transaction window shall be reinstalled in accordance with manufacturer’s printed recommendations, including adhering to anchoring and finishing details.

B. Inspection and Cleaning: Verify installation is complete and complies with manufacturer’s requirements. Clean product and accessories, removing excess sealant, labels and protective covers.

C. Touch-up, repair or replace damaged products before Substantial Completion.

D. Product Warranty: Applicable warranty shall be issued to owner upon final release of completed project.

END OF SECTION