



ST. TAMMANY PARISH SCHOOL BOARD

GYMNASIUM HVAC and ROOF REPLACEMENT AT COVINGTON ELEMENTARY SCHOOL

COVINGTON, LA

STPSB PROJECT NO. 1919



DAMMON ENGINEERING, INC.
554 OLD SPANISH TRAIL
SLIDELL, LOUISIANA 70458

December 16, 2025

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SECTION IA – REQUEST FOR QUOTATIONS

Separate sealed quotes will be received by the St. Tammany Parish School Board at the St. Tammany Parish School Board C.J. Schoen Administrative Complex, Reception Desk, 321 N. Theard, Covington, Louisiana 70433 for the Gymnasium HVAC and Roof Replacement at Covington Elementary School, **STPSB PROJECT NO. 1919** on the ____ day of _____, 2026, at **2:00 p.m.** (Time shall be established by the PBX clock at the Reception Desk at the above referenced address), at which time and place quotes will be publicly opened and read aloud.

Complete quotation documents are attached. Please contact the Architect, **Dammon Engineering, Inc., 554 Old Spanish Tr. Slidell, LA 70458; (985) 649-5832, info@dammonengineering.com** with any questions.

All quotes must be accompanied by quote security equal to five percent (5%) of the sum of the base quote and all alternates, and must be in the form of a certified check, cashier's check or bid bond.

The Successful Quoter will be required to furnish a performance and payment bond, each in an amount equal to 100% of the contract amount.

No quote may be withdrawn except as provided for by law.

Quoters must meet the requirements of the State of Louisiana Contractor's Licensing Law, Louisiana Revised Statute 37:2150.1 through 2164, as amended.

Preference may be given to materials, supplies and provisions produced, manufactured or grown in Louisiana in accordance with law.

The Owner reserves the right, in accordance with law, to reject any and all quotes.

A pre-quote conference will be held on the ____ day of _____, 2026, at ____:00 a/p.m. at **Covington Elementary School, 325 S Jackson St, Covington, LA 70433**. Quoters are strongly urged to attend and participate in the conference.

END OF SECTION IA

SECTION IB - INSTRUCTIONS TO PROPOSERS

COMPLETION TIME:

The Proposer shall agree to fully complete the contract within Forty Five (45) consecutive calendar days, subject to such extensions as may be granted in accordance with the Contract Documents, and acknowledges that this construction time will start on or before the date specified in the written "Notice to Proceed" from the Owner.

LIQUIDATED DAMAGES:

The Proposer shall agree to pay as Liquidated Damages the amount of Five Hundred Dollars (\$500.00) for each consecutive calendar day for which the work is not complete, beginning with the first day beyond the completion date stated on the "Notice to Proceed". Said sum shall in no event be construed to be a penalty; but only as damages fixed and agreed upon in advance.

CONSTRUCTION CLASSIFICATION:

Quotes will be accepted from Contractors who are properly licensed for the classification of General Contractor, (see La. R.S. 37:2156.2 for classifications).

ST. TAMMANY PARISH SCHOOL BOARD

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SECTION 1

DEFINITIONS

- 1.1 "Alternate Quote" (or Alternate) is an amount stated in the Quote to be added to or deducted from the amount of the Base Quote if the corresponding change in project scope or materials or methods of construction described in the Quote Documents is accepted by the Owner.
- 1.2 "Base Quote" is the sum stated in the Quote for which the Proposer offers to perform the Work described as the base, to which work may be added or deducted for sums stated in any Alternate Quote.
- 1.3 "Quote" is a complete and properly signed Quote Form to do the Work or designated portion thereof for the sums stipulated therein supported by data called for by the Quote Documents and subject to the requirements of the Contract Documents.
- 1.4 "Proposer" is one who submits a Quote for a prime contract with the Owner for the Work described in the proposed Contract Documents.
- 1.5 "Quote Documents" include but are not limited to:
 - 1.5.1 All definitions set forth in the General Conditions of the Contract.

SECTION IB - INSTRUCTIONS TO PROPOSERS

- 1.5.2 “Addendum” or “Addenda” are written or graphic instruments issued by the Architect prior to the opening of Quotes which modify or interpret the Quote Documents by additions, deletions, approvals, clarifications or corrections.
- 1.5.3 “Contract Documents” include all documents identified in the Agreement between the Successful Proposer and the Owner.
- 1.6 “Owner” is the St. Tammany Parish School Board.
- 1.7 “Subcontractor” is one who submits a Quote to a Proposer for a portion of the Work.
- 1.8 “Successful Proposer” means the lowest qualified responsible and responsive Proposer submitting a Quote and to whom the Owner makes an award.
- 1.9 “Unit Price” is an amount stated in the Quote as a price per unit of measurement for materials or services as described in the Contract Documents.
- 1.10 “Work” consists of the duties and obligations undertaken by the Proposer in accordance with the Contract Documents to complete the Project identified in the Contract Documents.

SECTION 2

PROPOSER'S REPRESENTATION

- 2.1 Each Proposer by submitting a completed and signed Quote Form represents that:
 - 2.1.1 He has read and understands the Quote Documents and his Quote is made in accordance therewith.
 - 2.1.2 He has examined and personally visited the site and the location of the proposed Work and has familiarized himself with the local conditions under which the Work is to be performed to include correlation of his personal observations with the requirements of the Contract Documents.
 - 2.1.3 His Quote is based upon the materials, systems, equipment or other items and conditions described in the Quote Documents without exception.
 - 2.1.4 He is satisfied as to (1) the conditions to be encountered, (2) the character, quality, and scope of the proposed Work, (3) the quality and quantity of the materials to be furnished, and (4) the requirements of the Quote, the plans and specifications, and other Contract Documents.
 - 2.1.5 He is fully qualified and licensed in accordance with La. R.S. 37:2150.1 through 37:2164 as amended, and under applicable state and local licensing requirements and he shall be responsible for determining that he and all Subcontractors or prospective subcontractors are duly licensed in accordance with state and local authorities.

SECTION IB - INSTRUCTIONS TO PROPOSERS

SECTION 3

QUOTE DOCUMENTS

3.1 COPIES

- 3.1.1 Prime Proposers who are properly licensed by the Louisiana State Licensing Board for Contractors may obtain from the Architect (unless another issuing office is designated in the Advertisement for Quote) at least one set of complete Quote Documents for the deposit, if any, stated in the Advertisement for Quote. Deposits for documents will be returned in accordance with law.
- 3.1.2 Quote Documents will be issued in accordance with law.
- 3.1.3 Complete sets of Quote Documents should be used in preparing Quotes; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Quote Documents.
- 3.1.4 The Owner or the Architect, in making copies of the Quote Documents available on the above terms, do so only for the purpose of obtaining Quotes on the Work and do not confer a license for any other use.

3.2 INTERPRETATION OR CORRECTION OF QUOTE DOCUMENTS

- 3.2.1 Proposers shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Quote Documents or of the site and local conditions.
- 3.2.2 Any interpretation, correction or change of the Quote Documents will be made by Addendum. Interpretations, corrections or changes of the Quote Documents made in any other manner will not be binding upon the Owner and Proposers shall not rely upon such interpretations, corrections and changes.

3.3 SUBSTITUTIONS/PRIOR APPROVALS

- 3.3.1 The materials, products and equipment described in the Quote Documents establish a standard of required function, dimension, appearance and quality to be met by any substitution proposed by the Proposer.
- 3.3.2 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect and Owner at least ten (10) calendar days prior to the date for receipt of Quotes. Each such request shall include the name of the manufacturer and distributor of the materials or equipment of the substitute and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the Proposer. The decision of the Owner concerning any substitute shall be final.
- 3.3.3 If the Owner approves any proposed substitution, such approval will be set forth in an Addendum. Proposers shall not rely upon approvals made in any other manner, whether oral or in writing.

3.4 ADDENDA

- 3.4.1 Addenda will be transmitted or delivered to all Proposers who have requested Quote Documents in accordance with law.

SECTION IB - INSTRUCTIONS TO PROPOSERS

- 3.4.2 Each Proposer should ascertain from the Architect prior to submitting a Quote that he has received all Addenda issued. All Quotes will be considered by the Owner as if the Proposer had received and considered all Addenda.

SECTION 4

QUOTE PROCEDURE

4.1 FORM AND STYLE

- 4.1.1 Quotes should be submitted on the Quote Form provided by the Owner. The form can be removed from the project manual or specifications. A duplicate copy is also acceptable.
- 4.1.2 Information requested on the Quote Form should be filled in by typewriter or legible hand printing or writing in ink.
- 4.1.3 Where so indicated by the makeup of the Quote Form, prices should be expressed in both words and figures, and in case of discrepancy between the two, the amount expressed in words shall govern.
- 4.1.4 All requested alternates shall be quoted.
- 4.1.5 Proposer shall not qualify his Quote in any manner.
- 4.1.6 Each Quote shall state the name of the Proposer. Written evidence of the authority of the person signing the Quote should be attached to the Quote; however, failure to submit written evidence shall not render a Quote non-responsive, and Owner expressly reserves the right to request additional information pertaining to the authority of the signatory, at Owner's sole discretion. Proposers are instructed to carefully review the law and the Quote Form for requirements in submission of a Quote.
- 4.1.7 Proposer shall certify that he is properly licensed and should show his license number on the Quote Form in the designated space and shall show his license number on the Quote envelope. Failure of the Proposer to certify that he is licensed or to include the contractor's license number on the Quote envelope may result in the Quote being automatically rejected, so marked, returned to the Proposer, and not read aloud in accordance with Louisiana Revised Statute 37:2163.

4.2 QUOTE SECURITY

- 4.2.1 Quotes will not be considered or accepted if the Quote is not accompanied by Quote security in an amount of five percent (5%) of the Base Quote. The Quote security shall be in the form of a certified check or cashier's check drawn on a bank insured by the Federal Deposit Insurance Corporation, or a bid bond written by a surety company licensed to do business in the state of Louisiana and qualified as required by the provisions of Louisiana Revised Statute 38:2218 and 38:2219. Any bond should be accompanied by the appropriate power of attorney with a valid effective date.
- 4.2.2 Quote security furnished by the Proposer should guarantee that the Proposer will, if awarded the Contract, perform according to the terms of his Quote and the Quote Documents and will enter into the Contract with the Owner.
- 4.2.3 Should the Proposer fail to perform according to his Quote and the Quote Documents, the amount of the Quote security shall be forfeited to the Owner as liquidated damages, not as a penalty.

SECTION IB - INSTRUCTIONS TO PROPOSERS

4.2.4 The Owner will have the right to retain the Quote security of Proposers until either (a) the Contract has been executed and Bonds have been furnished by the Proposer awarded the Contract, or (b) the time for the rejection of all Quotes by the Owner has expired.

4.3 SUBMISSION OF QUOTES

4.3.1 The signed Quote Form, the Quote security, and any other documents to be submitted with the Quote Form should be enclosed in a sealed, opaque envelope. The envelope should be addressed to St. Tammany Parish School Board, 321 N. Theard, Covington, Louisiana 70433 and be plainly marked "**QUOTES ON CONSTRUCTION OF Gymnasium HVAC and Roof Replacement at Covington Elementary School TO BE OPENED (Date)**" and include the Proposer's name, address, and **shall** include the Louisiana contractor's license number. If the Quote is sent by mail, the sealed envelope should be enclosed in a separate mailing envelope with the notation "QUOTE ENCLOSED" on the face thereof.

4.3.2 Quotes shall be deposited at the designated location prior to the time and date for receipt of Quotes indicated in the Advertisement, or any extension thereof made by Addendum. Proposers are responsible for timely delivery at the location designated for receipt of Quotes. Delays in the U.S. Mail or any other agent or delivery service remain the responsibility of the Proposer. Quotes received after the time and date for receipt of Quotes will be returned unopened.

4.4 MODIFICATION OR WITHDRAWAL OF QUOTE

4.4.1 A Quote may not be modified, withdrawn or canceled by the Proposer except in accordance with law.

4.4.2 Prior to the time and date designated for receipt of Quotes, Quotes submitted early may be modified or withdrawn only by written notice to the party receiving Quotes at the place and prior to the time designated for opening of Quotes

4.4.3 Withdrawn Quotes may be resubmitted up to the time designated for the opening of Quotes.

4.4.4 Quote security should be in an amount sufficient for the Quote as modified or resubmitted.

SECTION 5

CONSIDERATION OF QUOTES

5.1 OPENING OF QUOTES

5.1.1 Unless stated otherwise in the Advertisement for Quotes, the properly identified Quotes received on time will be opened publicly, will be read aloud, and an abstract of the amounts of the Base Quotes and Alternates, if any, will be made available to Proposers.

5.2 REJECTION OF QUOTES

5.2.1 The Owner shall have the right to reject any or all Quotes in accordance with law.

5.3 ACCEPTANCE OF QUOTE (AWARD)

5.3.1 The Owner reserves the right to reject all quotes received, to waive informalities, and to request additional information from Proposers.

SECTION IB - INSTRUCTIONS TO PROPOSERS

SECTION 6

SUBMISSIONS

- 6.1 If required by the Owner, the apparent low Proposer shall submit to the Architect and the Owner prior to award of the Contract, written documentation from any manufacturer that the manufacturer will issue the guarantee, such as a roof system guarantee, based on the specified system or equipment and include the name of the applicator acceptable to the manufacturer for installing the specified system and all requirements of the manufacturer which must be met in order for the guarantee to issue. The manufacturer shall be one that has received prior approval or is named in the specifications.

SECTION 7

PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

- 7.1 If the Project exceeds \$25,000, the successful Proposer shall furnish and pay for a performance bond and a statutory payment bond for public works, in accordance with the Contract Documents and Louisiana Revised Statute 38:2219 as amended.
- 7.2 The Bonds shall be issued in accordance with the provisions of Louisiana Revised Statute 38:2216 and 2219 as amended, except that they will be in the amount of one hundred percent of the Contract amount.
- 7.3 The Owner may record the executed Agreement and Bonds with the Clerk of Court for the Parish of St. Tammany.

SECTION 8

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

- 8.1 Unless otherwise provided in the Quote Documents, the Agreement and bond forms for the Work will be written on the forms as attached in the Contract Documents. Within five (5) days after the proposed agreement is presented to the Successful Proposer for execution, the Successful Proposer and his surety must execute the Agreement, unless otherwise agreed to by the Owner.

SECTION 9

AFFIDAVIT OF COMPLIANCE WITH LOUISIANA REVISED STATUTES 38:2212.9, 2224 AND 2227

- 9.1 Each person submitting a Quote, prior to an award of the Contract to them, will be required to sign and execute an affidavit before a Notary Public in the form provided to the effect that Proposer is qualified in accordance with law to Quote on the Work and to undertake the Work, and Proposer has not colluded with any person, firm, or corporation in regard to any Quote submitted, all in accordance with law. The form of the affidavit is in the Quote Documents.

SECTION 10

UNIT PRICES

- 10.1 Unit prices other than those requested in the Quote Form should not be submitted with any Quote.

SECTION IB - INSTRUCTIONS TO PROPOSERS

- 10.2 Unit prices furnished by the Contractor in the form of a proposal shall not be construed as an authorization to perform work or expend monies. Any change in the Work must be authorized by a written change order and signed in accordance with the Contract Documents.

SECTION 11

RELIEF FROM MISTAKE

- 11.1 Proposers are advised to review the provisions of law, particularly Louisiana Revised Statute 38:2214 C and D, as amended from time to time, to support an application to withdraw a Quote.
- 11.2 In the event a Proposer, after opening of the Quotes, attempts to utilize the provisions of Louisiana Revised Statute 38:2214 C to attempt to withdraw its Quote, the Owner will be the sole party to determine whether the alleged mistake is substantial.

SECTION 12

PRE-QUOTE CONFERENCE

- 12.1 A pre-Quote conference will be held at the time and place designated in the Advertisement for Quotes. Proposers are strongly urged to attend and participate in the conference.

SECTION 13

COMPLETION TIME AND LIQUIDATED DAMAGES

- 13.1 The completion of the Work must be within the time stated in these Instructions to Proposers, subject to any extensions as may be granted in accordance with Contract Documents or the contractor shall pay the Liquidated Damages in the amount as stated in these Instructions to Proposers.

END OF SECTION IB
November 22, 2022

SECTION IC -PAYMENT OF TAXES

The Bidder is responsible for the payment of all applicable sales, use or other taxes relating to any materials or services to which such taxes are imposed arising from its Bid or the Contract.

END OF SECTION IC

SECTION ID - QUOTE PROPOSAL FORM

PROJECT NO. 1919

This form, or a duplicate thereof, which is the proposal, is to be completed, signed, and delivered to the St. Tammany Parish School Board at the time and date specified, together with any other required documents, to include but not limited to the bid security documents.

Date: _____

TO: St. Tammany Parish School Board (Owner)
321 N. Theard St.
Covington, Louisiana 70433

QUOTE FOR: Gymnasium HVAC and Roof Replacement at Covington Elementary School
St. Tammany Parish School Board Project No. 1919

THE PROPOSER: (Name and Address as on Contractor's License)

_____ acknowledges receipt of the following:

ADDENDA: No. _____ Dated: _____ No. _____ Dated: _____

QUOTE SECURITY: attached is a [] Bid Bond; or, a [] Cashier's Check; or a Certified Check. The amount of the Bid Bond or Cashier's Check or Certified Check should be in the amount of 5% of the total quote, as found on Quote Proposal Form.

The Bid Security becomes the property of the Owner in the event the Agreement and Bonds are not executed within the time set forth as an agreed upon amount of liquidated damages for the delay and additional work caused thereby and not as a penalty.

THE PROPOSER: hereby declares that he: a) has carefully examined the Documents, b) has a clear understanding of the Documents, c) has not received, relied on, or based on his quote on any verbal instructions contrary to the Documents or any addenda, d) has personally inspected and is familiar with the project site, e) is vested with authority to bind the Proposer and sign the Quote Proposal Form on behalf of the Proposer, and f) hereby proposes to provide all labor, materials, tools, appliances, equipment and facilities as he is required to perform, including payment of all applicable taxes for the construction and completion of the Work, in a workmanlike manner, all in accordance with the Contract Documents.

QUOTE: For all work required by the Contract Documents, the lump sum of _____

_____ Dollars (\$_____).

COMPLETION TIME:

The Proposer hereby agrees to commence work under the Agreement and Bonds on a date specified in a written "Notice to Proceed" by the Architect and to substantially complete the Work included in this proposal within the time period identified in the Instructions for Proposers.

LIQUIDATED DAMAGES:

The Proposer hereby also agrees to pay Liquidated Damages in the amount identified in the Instructions for Proposers for each consecutive calendar day which the Work is not complete, beginning with the first day beyond the completion time stated above. Said sum shall in no event be construed to be a penalty; but only as damages fixed and agreed upon in advance.

AWARD AND EXECUTION OF CONTRACT:

The Owner shall incur no obligation to the Proposer until the Owner selected Proposer execute the Agreement. Proposer further agrees to submit the required insurance and bonds within five (5) days after execution of the Agreement.

REJECTION:

The Owner reserves the right to reject any or all quotes for cause or in accordance with law.

WITHDRAWAL:

The Proposer agrees that this Quote may not be withdrawn except in accordance with law.

LICENSE CERTIFICATION:

The Proposer certifies that he meets all licensing requirements of the State of Louisiana and as required by law, including under Louisiana Revised Statute. 37:2150.1 through 2164.

PREFERENCE:

A preference in favor of Louisiana quoters may be applied by Owner in accordance with Louisiana Revised Statute. 38:2225 as amended.

LOUISIANA CONTRACTOR'S LICENSE #: _____

The undersigned, through its authorized representative, respectfully submits this proposal,

Name of Proposer

Signature

By: _____
Name and Title

Address

City, State, Zip

Telephone Number

Fax Number

E-mail address

Employer's Registration Number under Social
Security Acts and/or Internal Revenue Service
Employer Identification Number

REQUIRED ATTACHMENTS:

- 1) Bid Security

ENVELOPE: Mark envelope containing quote, with the following information:

<p>"QUOTE FOR _____ DATE _____"</p> <p>To be delivered by 2:00 P.M.</p> <p>Quoter _____</p> <p>My Louisiana License No. is _____.</p>

IF THE QUOTE ENVELOPE DOES NOT CONTAIN THE ABOVE INFORMATION LEGIBLY PRINTED ON THE OUTSIDE OF THE ENVELOPE, THE QUOTE MAY BE AUTOMATICALLY REJECTED, RETURNED TO THE PROPOSER UNOPENED AND MARKED "REJECTED", AND NOT BE READ ALOUD.

AFFIDAVIT OF COMPLIANCE WITH LOUISIANA REVISED STATUTES 38:2212.9, 38:2224 AND 38:2227

STATE OF _____
PARISH/COUNTY OF _____

PROJECT NO. 1919
NAME Gymnasium HVAC and Roof Replacement at
Covington Elementary School,
LOCATION Covington, LA

AFFIDAVIT

BEFORE ME, the undersigned authority, duly commissioned and qualified within and for the state and parish aforesaid, personally came and _____, representing _____, being by me first duly sworn deposed and said that he/she has read and signed this affidavit and he/she does hereby attest, under oath, as follows:

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

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

(3) That neither affiant, nor any partner, incorporator, director, manager, officer, organizer, or member who has a minimum of ten percent ownership in the bidding entity, has been convicted of, or has entered a plea of guilty or nolo contendere to any crimes enumerated in Louisiana Revised Statute 38:2227, or equivalent federal crimes; and

(4) That neither affiant, nor any individual with an ownership interest of five percent or more in his/her firm has been convicted of, or has entered a plea of guilty or nolo contendere to any state felony crime or equivalent federal felony crime committed in the solicitation or execution of a contract or bid awarded under the laws governing public contracts as described in Louisiana Revised Statute 38:2212.8.

Bidder or representative to sign and type name below signature.

Affiant

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ day of _____, 2025.

NOTARY PUBLIC

GENERAL CONDITIONS FOR SMALL PROJECTS

These General Conditions shall govern the Agreement between the St. Tammany Parish School Board (“Owner”), and Contractor (“Agreement”).

1. General Provisions

1.1 The Contract Documents consist of this Agreement, the drawings, specifications, addenda issued prior to the execution of this Agreement, any contract modifications, including but not limited to change orders and construction change directives, the performance and payment bonds, any advertisement or solicitation for quotes/bids, and the Project Manual.

1.2 Contractor shall furnish all labor and materials to construct and complete the project shown on the contract documents and specifications, as identified in the Agreement (hereinafter “Work” or “Project”).

2. Payment

2.1 Owner shall pay Contractor for all labor and materials installed or consumed during the course of the work the sum specified in the Agreement between Owner and Contractor (“Contract Sum”).

2.2 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 of 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 other encumbrances adverse to the Owner’s interests.

3. Terms of Payment

3.1 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 Owner and Architect may require. This Schedule, unless objected to by the Owner or Architect, shall be used as the basis for reviewing the Contractor’s applications for payment.

3.2 Monthly, but not later than the 5th of the month, the Contractor shall submit to the Architect an application for payment for portions of the Work completed during the prior month, less retainage of ten percent (10%) for projects with a Contract Sum of less than \$500,000 and five percent (5%) for projects with a Contract Sum of \$500,000 or more. Each application for payment shall be prepared in accordance to the Schedule of Values, and will be reviewed by the Architect for accuracy based upon the progress and completeness of the Work.

3.3 If certified by the Architect, the Owner, within thirty days of receipt of the certified application for payment shall submit payment to the Contractor. In the event that the Architect or Owner disagrees with the application or anything contained therein, the application shall be returned to the Contractor for correction. Following correction of the application, the Contractor shall re-submit the payment application, at which time the Architect will review and the Owner will pay within thirty days of receipt of the certified application.

3.4 Final Payment. Upon completion of a final Application for Payment, the Architect will inspect the Work. When the Architect and Owner find the Work acceptable and the Contract fully performed, the Architect shall certify the application and the Owner shall issue payment to the Contractor upon thirty (30) days of such acceptance. Regardless of the foregoing, Final Payment shall not become due until the Contractor submits to the Architect a Clear Lien and Privilege Certificate issued by the Clerk of Court for the Parish of St. Tammany, Louisiana, which is dated at least forty-six (46) days after the recordation of the Certificate of Substantial Completion.

3.5 Liens. In the event a lien is filed by anyone in relation to the Work, the Architect or Owner shall have the right (1) to require the Contractor to furnish a release of lien that has been recorded by the entity filing the lien; (2) to require that the Contractor discharge the lien by posting a bond with the Clerk of Court for the Parish of St. Tammany; (3) obtain a Notice of Cancellation Certificate for each filed lien; and/or (4) withhold from payment then due or that may subsequently become due to the Contractor an amount of not less than 125% of the lien amount or as may be sufficient to indemnify the Owner against the lien/claimant, including bond premiums and attorney's fees, and to apply the same in such a manner as the Owner deems necessary to satisfy such claims and liens. In the event the Contractor does not cause the lien to be discharged, Contractor shall be deemed in default and the Owner shall have the right to terminate the Contractor and call upon the surety to complete the Work.

3.6 Withholding of Payment. The Architect may withhold or nullify a Certificate for Payment, in whole or in part, to the extent reasonably necessary to protect the Owner. Reasons for withholding or nullification include, but are not limited to, (1) defective or deficient Work not remedied, (2) third-party claims filed or that will probably be filed based upon reasonable evidence, (3) Contractor's failure to make payments to subcontractors or suppliers, (4) reasonable evidence that the Work cannot be completed with the unpaid balance of the Contract Sum, (5) repeated failure by the Contractor to properly carry out the Work, or (6) to assess liquidated damages due to Contractor's failure to complete the Work within the allotted Contract Time.

4. Architect

4.1 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, unless otherwise modified in writing in accordance with other provisions of the Contract.

4.2 The Architect will visit the site weekly and at intervals appropriate to the stage of the construction 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. 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 safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

4.3 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 promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) 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, or their agents or employees, or any other persons or entities performing portions of the Work.

4.4 Based on the Architect's evaluations of the Work and 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.

4.5 The Architect has authority to reject Work that does not conform to the Contract Documents and to require inspection or testing of the Work.

4.6 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.

4.7 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 will make initial decisions on all claims, disputes, and other matters in question between the Owner and Contractor but will not be liable for results of any interpretations or decisions rendered in good faith.

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

4.9 The Architect will prepare Change Orders and Construction Change Directives as provided herein.

4.10 Upon request of the Contractor, the Architect will conduct inspections to determine the date of Substantial Completion and the date of Final Completion and will issue the Punch List of items to be corrected by the Contractor.

5. Owner Responsibilities and Rights

5.1. If necessary for the Work, the Owner shall furnish all necessary surveys and a legal description of the site.

5.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, the Owner shall obtain and pay for other necessary approvals, easements, assessments and charges.

5.3 Owner's Right to Stop the Work. If the Contractor fails to correct Work that is not in accordance with the Contract Documents, the Owner may direct the Contractor to stop the Work until the correction is made.

5.4. 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 seven (7) day period after written receipt of notice from the Architect to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies. In such case, the Contract Sum shall be adjusted to deduct the cost of correction from payments due the Contractor.

5.5 Owner's Right to Perform Construction and to Award Separate Contracts. 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. The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner. Costs caused by delays or improperly timed activities or defective construction shall be borne by the party responsible therefor.

5.6 Right to Audit/Record Retention. The Contractor shall keep full and accurate records of all costs incurred and items invoiced in connection with the Work and shall keep and maintain all records related to this Project for a period of at least five (5) years after Final Payment. The Contractor shall require the same of its subcontractors, suppliers, or any entity involved with the Project or the Work. Such records shall be open to audit by the Owner and/or its authorized representatives and/or the Louisiana Legislative Auditor.

5.7 The Owner will not have control over or charge of, and will not be responsible for the construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility. The Owner will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

5.8 The Owner shall record this Agreement, along with the Payment and Performance Bonds, with the Clerk of Court for the Parish of St. Tammany, State of Louisiana.

6. Contractor Responsibilities

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

6.2 The Contractor shall comply with the provisions of the Louisiana Underground Utilities and Facilities Damage Prevention Law, La. R.S. 40:1749.11, *et seq.*, as amended, prior to any portion of the Work that may require excavation including, but not limited to, pile driving, digging, auguring, boring, backfilling, dredging, compressing, plowing-in, trenching, ditching, tunneling, land leveling, grading or mechanical probing. Damage to any existing underground utilities by the Contractor shall be repaired at the Contractor's sole cost and expense. Such damage must be reported immediately to the Owner. The Contractor shall undertake to make such further investigation including, without limitation, all structural, surface and subsurface conditions, including soil borings and otherwise of the Project site, regardless of whether or not shown in the Contract Documents.

6.3 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner and Architect. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies or omissions discovered to the Architect.

6.4 Contractor's Construction Schedule. The Contractor, promptly after being awarded the Contract, shall prepare and submit, for the Owner and Architect's approval, a Contractor's construction schedule for the Work. The schedule shall include the Date of Commencement as set forth in a Notice to Proceed and must show completion of the Work within the Contract Time. No schedule showing an early completion date will be accepted. The Contractor shall revise its schedule at appropriate intervals dictated by the condition and progress of the Work and shall provide for the expeditious and practical execution of the Work. The schedule may be used as a means to determine the Contractor's progress in performance of the Work, but neither the provision of the schedule by the Contractor nor its acceptance shall act in any way to relieve the Contractor of his obligations under the Contract. If the Contractor falls behind schedule due to no fault of the Owner or the Architect or due to unforeseen circumstances, the Contractor shall take appropriate measures to correct, at no additional cost to the Owner.

6.5 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 the construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work.

6.6 The Contractor, as soon as practicable after the award of the Contract, shall furnish in writing to the Owner through the Architect the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner has made a reasonable and timely objection. The Contractor shall not permit employment of unfit persons or persons not skilled in the tasks assigned to them. All employees or other persons carrying out the Work shall wear appropriate identification on their shirt at all times when on the Project.

6.7 The Contractor shall name a superintendent and, once approved by the Owner, the superintendent shall not be changed for the Project without prior approval of the Owner.

6.8 Log of Changes. The Contractor shall maintain a current log of Requests for Information (RFIs), Change Orders and Construction Change Directives, and shall provide the Architect with a copy of said logs on a monthly basis.

6.9 Unless otherwise provided for in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for the proper execution of the Work.

6.10 The Contractor shall enforce strict discipline and good order amount the Contractor's employees and other persons carrying out the Work.

6.11 All building materials incorporated into the Work shall be certified by the manufacturer to be free of asbestos in accordance with applicable federal standards, including, but not limited to, the Asbestos Hazard Emergency Response Act (AHERA) and the Toxic Substance Control Act (TSCA). Any materials discovered to contain asbestos shall be removed by the Contractor, at the Contractor's sole cost, using current standards of the Louisiana Department of Environmental Quality.

6.12 Warranty. The Contractor warrants to the Owner that (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Contractor's warranty includes any warranties required by law or the Contract Documents; however, nothing contained herein shall be construed as a limitation on the Owner's right to commence legal action, as provided by La. R.S. 38:2189.

6.13 Unless otherwise granted tax-exempt agent status by the Owner, the Contractor shall pay sales, consumer, use and similar taxes that are legally required when the Contract is executed.

6.14 Permits, Fees and Notices. The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work.

6.15 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. 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 full responsibility for such Work, and shall bear the attributable costs. The Contractor shall promptly notify the Architect in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

6.16 Submittals. The Contractor shall prepare a submittal schedule promptly after being awarded the Contract and submit said schedule to the Architect for approval. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule and (2) allow the Architect reasonable time to review submittals. The Contractor shall also promptly submit any product data, samples or other similar submittals to the Architect, if required by the Contract Documents.

6.17 Use of Site. The Contractor shall confine operations at the site to the areas permitted by law, ordinances, permits, the Contract Documents and the Owner.

6.18 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to makes its parts fit properly.

6.19 The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material, and shall properly dispose of waste materials.

6.20 The Contractor shall initiate, maintain, and supervise all safety precautions and programs in connection with the performance of the Work; and shall take reasonable precautions to prevent damage, injury and loss to (1) employees or other persons carrying out the Work or on the Project site, (2) the materials and equipment to be incorporated into the Work, and (3) other property at or adjacent to the Project site.

6.21 Tests and Inspections. Tests, inspections, and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, codes, ordinances, rules and regulations, or lawful orders of public authorities shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, or approvals with an independent testing laboratory acceptable to the Owner, or with the

appropriate public authority, and shall bear all related costs for such tests, inspections, and approvals.

6.22 Failure to Perform Work. The Contractor shall be liable to the Owner for all costs and damages that the Owner incurs as a result of the Contractor's failure to perform the Work, or any part thereof, in accordance with the Contract Documents. The Contractor's failure to perform shall include, but not be limited to, the failure of its subcontractors and suppliers of any tier to perform. The Contractor's liability to the Owner shall include, but not be limited to, (1) the increased costs of performance, to include the services of the Architect or other consultant(s), resulting from the Contractor's failure to comply with the Contract Documents; (2) the costs of removal of defective or non-compliant work; (3) costs of corrective or warranty work; (4) liability to third parties caused by the Contractor's failure to perform the Work or any portion thereof; (5) re-procurement costs; (6) attorney's fees and related costs, including costs incurred in enforcing the Owner's rights under the Contract Documents; and (7) liquidated damages.

6.23 Indemnification. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner and the Architect and their respective agents, Board, and employees from and against claims, damages, losses and expenses, included 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 identified hereunder.

7. Time of Completion

7.1 The work to be performed under this Agreement shall commence on a date established in a Notice to Proceed issued by the Owner ("Commencement Date") and be substantially completed within the number of calendar days of the Commencement Date, as set forth in the Agreement between Owner and Contractor. Time limits stated herein are the essence of the Contract. The Owner's operations will be impacted and delayed in if the Project is not substantially complete within the time set forth herein. The Contractor and the Contractor's surety shall be liable for and shall pay to the Owner the fixed, agreed and liquidated damages set forth in the Agreement between Owner and Contractor for each consecutive calendar day (including holidays and weekends) of delay until the Work is substantially complete. Such liquidated damages may be withheld by the Owner from the amounts due the Contractor for progress payments and deducted from the Contract Sum via a Change Order or Constructive Change Directive signed by the Owner.

7.2 Substantial Completion. Substantial completion is a 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 purpose. 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. Upon receipt of the Contractor's list, the Architect will inspect and determine whether the work or designated portion thereof is substantially complete. If the inspection discloses any item, whether or not included on Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the work for its intended use, the Contractor, before issuance of substantial completion, shall complete or correct such item and submit a request for another inspection. 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 and shall fix the time within which the Contractor shall finish all items on the punch list accompanying the Certificate. All warranties required by the Contract Documents and/or by law shall commence of the date of substantial completion.

7.3 Within ten (10) days of granting of Substantial Completion, the Owner shall prepare and attach a "Punch List" of exceptions itemizing work remaining to be done by the Contractor to include values commiserate with the cost should the Owner be required to hire third parties to complete said items, which items the Contractor shall complete within forty-five (45) days of the Substantial Completion date. All values associated with the Punch List shall be withheld from the Contractor's payments and shall not be released until the Owner verifies that said items are complete to the Owner's satisfaction. Pursuant to La. R.S. 38:2248(B), the Architect may revise the punch list within fourteen (14) days of submission of the list to the Contractor.

7.4 At its cost, the Contractor shall record the Certificate of Substantial Completion, along with the Punch List, evidencing that the Project has been declared substantially complete with the Clerk of Court for the Parish of St. Tammany, and the recording information shall be furnished to the Architect and the Owner.

8. Permits and Approvals

Contractor shall be responsible for determining which state and local permits are necessary for performing the specified work, and for obtaining and paying for permits.

9. Limited Warranty/Correction of Work

9.1 Contractor warrants that all work shall be completed in a good workmanlike manner and in compliance with all building codes and other applicable laws.

9.2 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement and additional testing.

9.3 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall for a period of one year after Substantial Completion correct work not conforming to the Contract Documents.

9.4 If the Contractor fails to correct non-conforming Work within a reasonable time, the Owner may correct it in accordance with Article 4.4. The Contractor's failure to correct non-conforming Work as required by this Article also shall be grounds for default of the Contract.

10. Subcontractors

The Contractor may at its discretion engage subcontractors to perform services under this Agreement, but Contractor shall remain responsible for proper completion of this Agreement.

11. Independent Contractor Status

Contractor is an independent contractor, not the Owner's employee. The Contractor's employees or subcontractors are not Owner's employees. Contractor and Owner agree to the following rights consistent with an independent contractor relationship.

- Contractor has the sole right to control and direct the means, manner and method by which the services required by this Agreement will be performed.
- The Contractor or Contractor's employees or subcontractors shall perform the services required by this Agreement; Owner shall not hire, supervise or pay any assistants to help Contractor.
- Neither Contractor nor Contractor's employees or subcontractors are eligible to participate in any employee pension, health, vacation pay, sick pay or other fringe benefit plan of Owner.

12. Changes in the Work

12.1 The Owner, without invalidating the Contract, may 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 in writing via a written Change Order signed by the Owner, Contractor, and Architect or, in the absence of agreement, a Construction Change Directive.

12.2 Change Orders. A Change Order shall be based upon a written agreement between the Owner, Architect, and Contractor authorizing a change in the Work or an adjustment in the Contract Sum and/or Time. Change Orders shall only include actual cost of the work of direct labor personnel (i.e. wages, fringe benefits), actual costs of direct materials and supplies necessitated by the change, costs of necessary materials and equipment necessitated by the change, and costs of premium increases for bonds and insurance directly resulting from the change. No off-site or home office fixed overhead shall be allowed. Overhead and profit shall be allowed but shall not exceed a total of fifteen percent (15%) of the direct costs of work being

added by the change, with the General Contractor limited to a maximum OH&P markup of ten percent (10%) on work being performed by subcontractors.

12.3 Change Directives. In the event an agreement regarding the cost or time of a proposed change cannot be reached, the Owner shall issue a Construction Change Directive (“CCD”) to the Contractor ordering the Contractor to perform the work. The CCD shall adjust the Contract Sum and/or Time in an amount that the Owner determines to be equitable; and the Contractor shall be required to perform the Work contemplated by the CCD. However, the Contractor shall be permitted to submit a claim to the Owner should it disagree with the adjustment. Contractor shall be required to maintain detailed records for all work encompassed by the CCD in order to be entitled to additional time or money for the work added by the CCD. If the Owner and Contractor cannot agree to a change in the Contractor Sum, the Owner shall pay the Contractor its actual cost, plus and additional ten percent (10%) for overhead and profit.

12.4 The Architect and the Owner shall have the authority to order minor changes in the Work not involving changes in the Contract Sum or Contract Time and not inconsistent with the intent of the Contract Documents. The Contractor shall promptly carry out such orders.

12.5 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those ordinarily found to exist, the Contractor shall notify the Architect promptly and before the conditions are disturbed, and the Contract Sum and Contract Time may be subject to equitable adjustment.

13. Insurance

13.1 The Contractor shall procure and maintain insurance for the duration of the Project and, shall insure that all subcontractors carry and maintain similar insurance in the form and amount acceptable to the Owner. The insurance shall be of the types and limits set forth herein and such insurance as will protect the Contractor from claims which may result from the Contractor’s execution of the work, with such execution be by the Contractor or by those employed by the Contractor or by those who acts they may be liable. All insurance provided by the Contractor shall be primary and be issued by carriers authorized to conduct business in the State of Louisiana.

13.2 The Contractor shall procure general liability insurance covering bodily injury and property damage liability for all hazards of the project, including premise and operations, contractor’s protective liability, products and completed operations, contractual and personal injury liabilities with a minimum combined single limit of \$1,000,000.00.

13.3 The Contract shall procure Workers’ Compensation insurance in accordance with the Workers’ Compensation law of the State of Louisiana.

13.4 The Contractor shall procure automobile liability insurance against claims for bodily injury, death, or property damage resulting from the maintenance, ownership or use of all

owned, non-owned, and hired automobiles, trucks, and trailers in the minimum acceptable limit of \$1,000,000.00 per occurrence.

13.5 The above policies shall contain a waiver of subrogation clauses wherein the Contractor, to the fullest extent allowed by law, waives all rights against the Owner, its officers, agents, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

13.6 The Contractor shall be responsible for the payment of all deductibles and self-insured retentions.

13.7 Performance and Payment Bonds. The Contractor shall procure performance and payment bonds using the Owner's forms for the full amount of the Contract Sum.

13.8 The Owner shall be listed as an Additional Insured on all policies, where permitted. The Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of the required coverage. The Owner reserves the right to request complete certified copies of all required insurance policies at any time.

13.9 The Contractor shall include all subcontractors as insureds under its policies or shall be responsible for verifying and maintaining certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements herein. The Owner reserves the right to request copies of subcontractor's certificates at any time.

14. Terminating the Agreement

14.1 Termination by the Owner for Cause.

The Owner may terminate the Contract if the Contractor:

- Repeatedly refuses or fails to supply enough properly skilled workers or proper materials to carry out the Work as required by and within the time proscribed by the Contract Documents;
- Fails to make payment to subcontractors for materials or labor in accordance with the respective agreements between the Contractor and Subcontractors;
- Repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- Fails to complete punch list and/or warranty work as required by law or the Contract Documents; or
- Otherwise guilty of a substantial breach of any provision of the contract documents.

14.1.1 When any of the above reasons exist, the Owner may, with or without certification of the Contractor's default by the Architect, without prejudice to any other rights or remedies of

the Owner and after giving the Contractor and the Contractor's surety seven days' written notice, terminate employment of the Contractor and may (1) take possession of the site and all materials thereon owned by the Contractor, and (2) finish the Work by whatever reasonable method the Owner may deem expedient.

14.1.2 When the Owner terminates the Contract for one of the reasons stated in Article 14.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

14.1.3 If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, such excess shall be paid to the Contractor. If such cost exceeds the unpaid balance, the Contractor and surety shall be liable to the Owner for the difference and shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Contract.

14.2 Termination by the Owner for Convenience.

The Owner may, at any time, terminate the contract for the Owner's convenience and without cause upon written notice to the Contractor. In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for work actually executed and performed, along with reasonable overhead and profit on the work actually performed and executed, not to exceed ten percent (10%).

14.3 Termination by the Contractor for Cause:

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

- Issuance of an Order of a Court or other public authority having jurisdiction that requires all work to be stopped;
- An act of government, such as a declaration of national emergency that requires all work to be stopped;
- The Owner has failed to pay properly submitted applications for payment of the Contractor for a period of ninety days.

15. Exclusive Agreement

This is the entire Agreement between Contractor and Owner.

16. Resolving Disputes

16.1 In the event of a dispute involving this Agreement, the party raising the issue shall provide the other party with written notice of the claim within fifteen (15) days after occurrence of the event giving rise to the claim. Any such notice must be provided to the Architect as well.

16.2 If a dispute arises under this Agreement, the parties shall first endeavor to amicably resolve the dispute. In the event the dispute cannot be resolved, either party may institute litigation in the 22nd Judicial District Court for the Parish of St. Tammany, which court shall serve as the exclusive jurisdiction and venue for any disputes arising out of this Agreement.

16.3 Time Limit on Claims. See, La. R.S. 38:2189 for the time limit on claims.

17. Notices

All notices and other communications in connection with this Agreement shall be in writing and shall be considered given as follows:

- When delivered personally to the recipient's address as stated on this Agreement
- Three days after being deposited in the United States mail, with postage prepaid to the recipient's address as stated on this Agreement, or
- When sent by fax or telex to the last fax or telex number of the recipient known to the person giving notice. Notice is effective upon receipt provided that a duplicate copy of the notice is promptly given by first class mail, or the recipient delivers a written confirmation of receipt.

17. No Partnership

This Agreement does not create a partnership relationship. Neither party has authority to enter into contracts on the other's behalf.

19. Applicable Law

This Agreement will be governed by the laws of the State of Louisiana.

20. Miscellaneous Provisions

20.1 Assignment of the Contract. Neither party shall assign the Contract as a whole without written consent of the other party.

20.2 The Contractor waives any and all claims against the Owner for consequential damages arising out of this Contract, including, but not limited to, damages incurred by the Contractor for principal office expenses (including the compensation of personnel stationed there), for losses of financing, business and reputation, for attorneys' fees, and for loss of profit except anticipated profit arising directly from the Work.

20.3 Severability. The invalidity of any provision of the Contract Documents shall not invalidate the Agreement or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable and the Contract Documents shall be construed to give effect to the parties' intentions and purposes in executing this Agreement.

20.4 Waiver of Subrogation. The Owner and Contractor waiver all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, (2) the Architect and its consultants, (3) separate contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by this Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance.

DIVISION 1

GENERAL REQUIREMENTS



DAMMON
ENGINEERING, INC.

DAMMON ENGINEERING, INC.
554 OLD SPANISH TRAIL
SLIDELL, LOUISIANA 70458
Phone: 985-649-5832
www.dammonengineering.com
info@dammonengineering.com

SECTION 01 10 00
SUMMARY OF WORK

1. GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Coordination with occupants.
4. Work restrictions.
5. Specification and drawing conventions.
6. Miscellaneous provisions.

1.2 PROJECT INFORMATION

Project Identification:

**GYMNASIUM HVAC and ROOF REPLACEMENT
AT COVINGTON ELEMENTARY SCHOOL
Project No: 1919**

A. Project Location:

**Covington Elementary School
325 S. Jackson St,
Covington, LA 70433**

B. Owner:

**St Tammany Parish School Board
C.J. Schoen Administrative Complex
321 N. Theard
Covington, Louisiana 70433**

Owner's Representative:

Cameron Tipton, Chief of Construction

C. Engineer:

**Dammon Engineering, Inc.
Brian Mistich, Chief Engineer
554 Old Spanish Trail
Slidell, LA 70458**

Contact:

David Dammon
(985) 649-5832

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this Project is defined by the Contract Documents and consists of the following:

1. This project consists of the removal and installation of 2 new HVAC roof top units. The roof shall be re-roofed over the stage area of the gymnasium.

- B. Type of Contract.
 - 1. Project will be constructed under a single prime contract.

1.4 COORDINATION WITH OCCUPANTS

- A. Owner Occupancy: Owner will occupy site and adjacent buildings during the entire construction period. Owner will, at his/her expense, rent a portable building for day to day operations. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations. All contractor and their employees, vendors and sub-contractors' and their employees shall provide necessary documentation to the contact at Troop L, showing that they have a legal status for working within the United States. Acceptable forms of documentation would be a valid state driver's license, an ID or country passport, all of which must have a photo ID identifying the person.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to interior of building under renovation.
 - 2. Driveways, Walkways and Entrances: Keep driveways, parking areas, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. On-Site Work Hours: Limit work at the facility from sun-up to sundown, 7 days a week except Holidays or as otherwise directed. Finishing work that is conducted inside with no major movement outside (e.g., trash removal by large trucks and/or machinery, etc. - high noise), may be done to later hours, e.g., 10 pm.

- E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
- F. Controlled Substances: Use of tobacco products and other controlled substances is not permitted on Project site.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

2.PRODUCTS (Not Used)

3.EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 -

PART 2 - GENERAL

2.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

2.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

2.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit one electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

2.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials.

PART 3 - PRODUCTS

3.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution prior to bid but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

- b. Requested substitution provides sustainable design characteristics that specified product provided.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 4 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on "Engineer's Supplemental Instructions."

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
 2. Within the time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms provided by Owner.
- B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.

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

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Designer will issue a Change Order for signatures of Owner and Contractor on form included in Project Specification.

1.5 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Engineer may issue a Construction Change Directive on AIA form G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.

- B. Related Sections:
 - 1. Section 01 73 00 "Execution".
 - 2. Section 01 26 00 "Contract Modification Procedures".

1.2 DEFINITIONS

- A. RFI: Request from Owner, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner through Designer and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Project closeout activities.
 6. Startup and adjustment of systems.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Engineer will not accept RFIs submitted to Engineer by other entities controlled by Contractor. Any such RFI submittals will be reported to the Contractor by the Engineer.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.

9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA Document G716.
- D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven (7) working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned, with Engineer informing Contractor of "no action":
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Engineer's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
 3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within ten (10) days of receipt of the RFI response.
- E. On receipt of Engineer's action, immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven (7) days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETING

- A. Preconstruction Conference: Designer will schedule and conduct a preconstruction conference at Project site before starting construction, at a time convenient to Owner and Contractor.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Contractor shall furnish to the Engineer and Owner at the Preconstruction Conference:
 - a. The Schedule of Values.
 - b. List of Subcontractors.
 - c. Information listed in Paragraph 7.1 of the Supplementary Conditions.
 - d. The Construction Schedule.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Designation of key personnel and their duties.
 - b. Change Orders.
 - c. Invoice Procedures.
 - d. Prior Approval.
 - e. Testing Lab, Procedures for testing and inspecting.
 - f. Project Sign.
 - g. Meetings.
 - h. General Correspondence.
 - i. Shop Drawings.
 - j. Procedure for keeping Record Documents.
 - k. Security.
 - l. User's occupancy requirements.
 - m. Location of staging areas and use of the premises.
 - n. Parking availability.
 - o. Location and type of temporary facilities and utilities.
 - p. Responsibility for temporary facilities and controls.
 - q. Office, work, and storage areas.
 - r. Equipment deliveries.
 - s. Outages/Interruptions of Services.
 - t. Work restrictions.
 - u. Working hours.
 - v. Progress cleaning.
 - w. Safety and First Aid.
 - x. Use of any Asbestos Containing materials is prohibited.
 - y. Pre-Closeout Conference.
 4. Minutes: Designer will record and distribute meeting minutes.

- B. Preinstallation Conferences: Designer will conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Designer will record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Designer will distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- C. Progress Meetings: Designer will conduct progress meetings at Project site at monthly intervals.
1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current

progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- D. Pre-Closeout Conference: Designer will schedule and conduct a pre-closeout conference at the project site when construction is 75% to 85% complete.

1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Engineer's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be provided by Engineer for Contractor's use in preparing submittals.
 - 1. Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
 - a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow fifteen (15) work days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow fifteen (15) work days for review of each resubmittal.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Engineer, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.

- j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by Engineer.
- F. Deviations: Identify deviations from the Contract Documents on submittals, deviations will not be allowed if it changes "type."
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files, photos shall be submitted under Section 01 32 33 "Photographic Documentation".
 - a. Engineer will return annotated PDF file. Annotate and retain one copy of file as an electronic Project record document file. Digital photographic documentation will not be returned. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF Electronic file.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
 3. Submit Shop Drawings in the following format:
 - a. PDF Electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two (2) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer, will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three (3) sets of Samples. Engineer will retain two (2) Sample sets; remainder will be returned.
 - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Submit product schedule in the following format:
 - a. PDF Electronic file.
- F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures."
- G. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."
- H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- J. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

- K. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- M. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- N. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- O. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- P. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them to Contractor without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

END OF SECTION 01 33 00

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Engineer, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Engineer, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- B. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- C. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- B. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. At Substantial Completion, repair, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 01 73 00
EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
1. Construction layout.
 2. Field engineering and surveying.
 3. Installation of the Work.
 4. Cutting and patching.
 5. Coordination of Owner-installed products.
 6. Progress cleaning.
 7. Starting and adjusting.
 8. Protection of installed construction.

1.2 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 2. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Engineer promptly.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

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- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.

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- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

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2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at time of Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

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3.8 PROTECTION OF INSTALLED CONSTRUCTION

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

END OF SECTION 01 73 00

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

1.3 DEFINITIONS

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

1.4 QUALITY ASSURANCE

- A. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- B. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching.

1.5 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.

- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

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1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 29

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures preceding the Recommendation of Acceptance.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

1.2 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at time of Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Recommendation of Acceptance.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: Contractor to provide four (4) copies of binders containing maintenance and warranty information.

1.5 SUBSTANTIAL COMPLETION PROCEDURES PRECEDING THE RECOMMENDATION OF ACCEPTANCE

- A. Contractor's List of Incomplete Items: Prepare and submit a preliminary list of items to be completed and corrected (Contractor's Preliminary Punch List).
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Recommendation of Acceptance. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services

- and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.
 5. Submit test/adjust records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Recommendation of Acceptance. List items below that are incomplete at time of request.
1. Advise Owner through Designer of pending insurance changeover requirements.
 2. Complete startup and testing of systems and equipment.
 3. Perform preventive maintenance on equipment used prior to Substantial Completion.
 4. Instruct User's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 5. Advise Owner through Designer of any changeover in utilities.
 6. Terminate and remove temporary facilities from Project site, along with construction tools and similar elements.
 7. Complete final cleaning requirements, including touchup painting.
 8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Recommendation of Acceptance a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Recommendation of Acceptance after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance. Designer will verify.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct User's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 PRELIMINARY LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each item needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Submit preliminary list of incomplete items in PDF electronic file format.
 2. Designer will prepare final punch list.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Recommendation of Acceptance is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed

description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

- C. Provide additional copies of each warranty to include in operation and maintenance manuals, to be submitted in triplicate.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
 1. Clean exposed surfaces.
 - a. HEPA vacuum all surfaces.
 - b. Damp wipe all non-porous exposed surfaces including polyethylene sheets used to protect materials, external surfaces of ductwork, studs, and floors with clean rag and clean potable water or detergent solution.
 - c. Remove any poly sheeting protecting desks or equipment and HEPA vacuum all surfaces protected by poly sheeting.
 - d. Damp wipe non-porous surfaces protected by poly sheeting with clean water or a detergent solution.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for Recommendation of Acceptance for entire Project or for a designated portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
- b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- f. Remove labels that are not permanent.
- g. Wipe surfaces of mechanical and electrical equipment if any and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- h. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- i. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Recommendation of Acceptance.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 01 77 00

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Operation and maintenance documentation directory.
 2. Operation manuals for systems, subsystems, and equipment.
 3. Product maintenance manuals.
 4. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.
 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format to the Engineer:
1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Engineer.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
- C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Engineer will return copy with comments.
1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Engineer's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- C. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Engineer.
 - 7. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.

4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

1.2 CLOSEOUT SUBMITTALS

- A. Marked up Record Drawings: Comply with the following:
 - 1. Submit one (1) color paper-copy set(s) of marked-up record prints. Print each drawing, whether or not changes and additional information were recorded.
 - 2. Submit PDF electronic files of color scanned record prints.
 - 3. Engineer will indicate whether general scope of changes, additional information recorded, and quality of mark-ups are acceptable.
- B. Record Specifications: Submit one paper copy or annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy or annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it.

- c. Record and check the markup before enclosing concealed installations.
2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy or annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy, annotated PDF electronic files or scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy, annotated PDF electronic files or scanned PDF electronic file(s) of marked-up paper copy of Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

END OF SECTION 01 78 39

DIVISION 2

Existing Conditions



DAMMON
ENGINEERING, INC.

DAMMON ENGINEERING, INC.
554 OLD SPANISH TRAIL
SLIDELL, LOUISIANA 70458
Phone: 985-649-5832
dammonengineering.com
info@dammonengineering.com

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected equipment within the building.
 - 2. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to User ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to User.

1.5 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure User's on-site operations are uninterrupted.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Coordination of User's continuing occupancy of portions of existing building and of User's partial occupancy of completed Work.
 5. Means of protection for items to remain and items in path of waste removal from building.
 6. Method of providing on-site security.
- B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- C. Predemolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6 and NFPA 241.
- C. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:
1. Inspect and discuss condition of construction to be selectively demolished.
 2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 4. Review areas where existing construction is to remain and requires protection.
 5. Review procedures for site security and work site access.

6. Review procedure(s) for identification and or removal of any asbestos that may be found during demolition.

1.7 PROJECT CONDITIONS

- A. User will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so that User's operations will not be disrupted.
 1. Comply with requirements specified in Section 01 10 00 "Summary of Work."
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect in writing of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials:
 1. Upon encountering any previously unidentified materials which he suspects may contain asbestos, the Contractor shall immediately cease all work in the immediate vicinity of the suspected materials and notify the Designer and the Owner. The Owner shall retain consultants to identify the suspected materials. Upon identification, the Owner reserves the right to contract separately for the removal or require the Contractor (if qualified) to remove said materials in accordance with the following provision. In any case, the work shall be performed by a licensed and certified Abatement Contractor.
 2. The Louisiana Department of Environmental Quality (D.E.Q.) has issued the Louisiana Emission Standards for Hazardous Air Pollutants. Where asbestos is encountered in a project, the Contractor shall comply with all laws and ordinances pertaining to asbestos handling and abatement, including the latest revision of LAC 33:III, Chapter 25, Subchapter F, Emission Standards for Hazardous Air Pollutants, LAC 33: III, Chapter 27, Asbestos Containing Materials in Schools and Public Buildings and LAC:33III, Chapter 51, Subchapter M, Section 5151, Emission Standards for Asbestos.

Notification should be addressed to:

Asbestos Supervisor
Louisiana Department of Environmental
Quality
Air Quality Division
Post Office Box 4313
Baton Rouge, Louisiana 70831-4313

3. If the Owner chooses to remove any previously unidentified materials by utilizing different Contractors, the Contractor shall cooperate fully with the Owner's consultants and asbestos abatement Contractor permitting them full access to the project, and shall not resume work in the vicinity of the suspected materials until advised by the Designer and the Owner that it is safe to do so.

4. The Designer shall specify the use of third party air monitoring firms (with no ownership associations with the contractor) in an expanded inspection role as follows: document daily work activities, number of workers present, track and quantify removal quantities (where necessary and where unit pricing is called for in specifications), perform pre-clearance inspection and verify on a daily basis the contractor work with the design documents and report to the designer any conflicts.

5. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify both Architect and Owner in writing.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities and life safety components in service during selective demolition operations.

1.8 WARRANTY

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Owner and Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or preconstruction videotapes.
 - 1. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- G. All existing insulation above affected ceilings is to be removed and stored prior to demolition.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary of Work."
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Cut off pipe or conduit to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection by Authority Having Jurisdiction required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 3. Cover equipment or any other items that have not been removed.
 - 4. Comply with requirements for temporary enclosures, run-off control specified in Section 01 50 00 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify

- condition and contents of hidden space before starting flame-cutting operations. Maintain **fire watch and** portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Store items in a secure area until delivery to User. Verify location with User.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete. Coordinate location with User.
- 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

- D. Suspended Drywall Ceiling: Remove and store insulation prior to starting the demolition of the suspended drywall ceiling.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove all debris from work site daily to Staging Area.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

DIVISION 7

Thermal and Moisture Protection



DAMMON
ENGINEERING, INC.

DAMMON ENGINEERING, INC.
554 OLD SPANISH TRAIL
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SECTION 07 52 00

STYRENE BUTADIENE STYRENE (SBS) MODIFIED BITUMEN MEMBRANE ROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. The project plans, details and general Contract requirements apply to this Section.

1.2 SUMMARY

A. Items Included:

1. Cover panel.
2. SBS modified bituminous membrane roofing.
3. Walktread.

1.3 REFERENCE STANDARDS

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 this specification section.

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research
NRCA	National Roofing Contractors Association Rosemont, IL
OSHA	Occupational Safety and Health Administration Washington, DC
SMACNA	Sheet Metal and Air Conditioning Contractors National Association Chantilly, VA
UL	Underwriters Laboratories

1.4 DESCRIPTION OF WORK

The basic work descriptions required in this specification are referenced below.

Existing Assembly: Existing Siplast Paradiene 20/30 FR, applied over fiberglass base sheet mechanically attached to gypsum substrate. Remove the base flashings and any wet/damaged/deteriorated membrane plies. Replace the areas using compatible materials, bringing them back level with surrounding surfaces.

Cover Panel: DensDeck Prime, having a thickness of 1/4 inch, adhered in Para-Stik Insulation Adhesive.

Roof System: Paradiene 20 TG, torch applied;
Paradiene 30 FR TG, torch applied.

Flashing System: Pro Base, applied in SFT Cement;
Parapro 123 Flashing System.

Supplemental Flashing: Parapro 123 Flashing System apply and applicable roof penetrations and extend around HVAC curbs and parapet flashing where drainage is poor or blocked by the HVAC support curb.

1.5 PREINSTALLATION MEETINGS

- A. Pre-installation Roofing Conference at Jobsite: Hold a meeting with the Owner, Construction Manager, Architect, Roofing Contractor, Roofing Manufacturer's Representative, and other applicable trades to discuss the means and methods related to roofing installation. The Roofing Contractor shall examine the substrate that will receive the specified roofing materials and confirm its suitability for attachment of the specified roofing system.

1.6 SUBMITTALS PRIOR TO PROJECT START:

A. Submittals Prior to Project Start

1. The primary roofing materials must be available at the jobsite a minimum of 2 weeks prior to project start. The owner may test randomly select two rolls each of the proposed base and finish plies for empirical confirmation by an independent testing lab of the following physical/mechanical properties if so desired. Substandard test materials that do not meet the physical/mechanical properties listed below shall be considered representative of the entire lot of material provided. At no additional cost to the owner the substandard materials must be removed from the job site and replaced by the contractor with a different manufacturer's products that meet the specified requirements.

a) Base ply

- Thickness (avg): 114 mils (2.9 mm) (ASTM D5147)
- Low temperature flexibility @ -15°F (-26°C): PASS (ASTM D5147)
- Ultimate Elongation (avg.) @ 73°F (23°C): 80% (ASTM D5147)

- High Temperature Stability (min): 250F (121C) (ASTM D 5147)
 - Confirmation that the membrane material is a homogenous SBS blend composition without the use of oxidized asphalt as a carrier saturant
- b) Finish ply
- Thickness at selvage (coating thickness) (min): 134 mils (3.4 mm) (ASTM D 5147)
 - Low temperature flexibility @ -15F (-26C): PASS (ASTM D 5147)
 - Ultimate Elongation (avg.) @ 73°F (23°C): 80% (ASTM D5147)
 - High Temperature Stability (min): 250F (121C) (ASTM D 5147)
 - Granule Embedment (max loss): 2.0 grams per sample (ASTM D 5147)
- Confirmation that the membrane material is a homogeneous SBS blend composition without the use of oxidized asphalt as a carrier saturant

1.7 SUBMITTAL OF ALTERNATE SYSTEMS

All submittals which do not conform to the following requirements will be rejected.

- A. Submittal of Equals: Submit primary roof systems to be considered as equals to the specified roof system. Submittals shall include the following:
1. Two 3 inch x 5 inch samples of the primary roofing and flashing sheets.
 2. Latest edition of the roofing system manufacturer's specifications and installation instructions.
 3. Evidence that the manufacturer of the proposed roofing system utilizes a quality management system that is ISO 9001:2000 certified. Documentation of ISO 9001:2000 certification of foreign subsidiaries without domestic certification will not be accepted.
 4. Evidence and description of manufacturer's quality control/quality assurance program for the primary roofing products supplied. The quality assurance program description shall include all methods of testing for physical and mechanical property values. Provide confirmation of manufacturer's certificate of analysis for reporting the tested values of the actual material being supplied for the project prior to issuance of the specified guarantee.
 5. Descriptive list of the materials proposed for use.
 6. Evidence of Underwriters' Laboratories Class A acceptance of the proposed roofing system (including mopping asphalt or cold adhesive) without additional requirements for gravel or coatings. No other testing agency approvals will be accepted.

7. Evidence of Factory Mutual Approval Standard 4470 for the proposed membrane system.
 - a) The roof membrane configuration shall be approved by FM for Class 1-SH (severe hail) exposure.
8. Independent Testing Agency: The new roof membrane configuration shall provide a maximum design pressure of -45 psf.
9. Letter from the proposed primary roofing manufacturer confirming that a phased roof application, with only the modified bitumen base ply in place for a period of up to 14 days, is acceptable and approved for this project.
10. List of 3 of the proposed primary roofing manufacturer's projects, located in the United States, of equal size and degree of difficulty which have been performing successfully for a period of at least 10 years.
11. Request for substitution constitutes a representation that the Contractor:
 - a. Has personally investigated the proposed substitute product and determined that it is equal to or superior in all respect to that specified.
 - b. Will provide the same or better warranties, bonds and guarantees for the substitution as for the specified product.
 - c. Will coordinate the installation of an accepted substitution into the Work and making such changes as may be required to make the Work complete in all respects.
 - d. Waives all claims for additional costs, related to the substitution which may subsequently become apparent.
 - e. Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesigns costs, and waives all claims for additional costs related to the substitution which subsequently become apparent.
12. Should the Contractor propose a substitute material or method assembly that is of questionable quality or suitability to the Architect, suitable tests may be required to establish a basis for acceptance or rejection. Such tests will be paid for by the Contractor and conducted in accordance with industry accepted standards and as accepted to the Architect.
13. Substitutions will not be considered when they are indicated or implied in shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
14. The Architect shall be the judge of the acceptability of proposed substitutions.
15. The Owner reserves the right to disapprove and reject any request for substitution.

16. Complete list of material physical and mechanical properties for each sheet including: weights and thicknesses; low temperature flexibility; peak load; ultimate elongation; dimensional stability; compound stability; high temperature stability; granule embedment and resistance to thermal shock for foil faced products.
 17. Letter from the proposed primary roofing manufacturer confirming that the filler content in the elastomeric blend of the proposed roof membrane and flashing components does not exceed 35% in weight.
 - A letter or statement presented by the primary roofing manufacture, as part of a prior approval submission, indicating that the filler content or SBS sheet blend is proprietary information and cannot be provided, does not affirm that the product(s) meets item 16 and will not be approved as an equal substitution.
 18. Manufacturers' Published Commercial Product Data Sheets: Submit product data on all SBS roof membrane(s) and SBS flashing membrane(s) meeting and/or exceeding Part 2, 2.02 Description of Systems, A, (1, 2, 3) and B, (1 and 2), shall have third party validation by an accredited testing agency confirming that the manufacturer's proposed membrane(s) meet the physical properties published on the roofing manufacturer's product data sheets for the proposed membrane(s). All membranes shall be tested in accordance with ASTM D 5147 requirements. An independent seal of approval from the third party accredited testing agency shall be affixed on each proposed product(s) submitted as indicated above.
 19. Sample copy of the proposed guarantee.
 20. Completed Product Substitution Request Form included with this specification section.
- B. Technical Product Data: Submit the manufacturer's technical product data sheets for each type of product.
- C. Shop Drawings: Include plans, sections, and shop drawings/details for all applicable conditions.
- D. Product Samples: Submit product samples of the specified base, finish, flashing reinforcing, and flashing membrane plies.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. Installer: Submit written confirmation that they have a minimum of 2 years of experience in successfully installing the same or similar roofing materials

and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

2. Manufacturer: Submit written confirmation that the manufacturer of the primary roofing products has been successfully producing the specified types of primary products for not less than 10 years with a consistent composition for a minimum of 5 years.
- B. System Qualification:
1. Intent to Warrant Letter: Submit a signed letter on the roof membrane manufacturer's letterhead, confirming that specified roofing system complies with the guarantee requirements indicated in Part 1.11 and the criteria indicated in Part 2.2 Roof Membrane Sheet Materials.
 2. Cyclic Fatigue: Submit confirmation that the proposed roof system will pass 500 cycles of ASTM D5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C), and 200 cycles after heat conditioning (performed in accordance with ASTM D5147), showing no signs of membrane cracking or interply delamination.
 3. Sample Guarantee: Submit a sample copy of the manufacturer's proposed Guarantee.

1.09 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Submit the manufacturer's care and maintenance guide.
- B. Executed Guarantee: Provide the Owner with an executed version of the specified guarantee.

1.10 QUALITY ASSURANCE

- A. Fire Rating: Submit evidence of exterior fire-test exposure by an approved third-party testing agency in accordance with ASTM E108 or UL 790 guidelines.
 1. Class A
- B. Wind Uplift Rating: Submit evidence by an approved third-party testing agency that the roof configuration has been tested to meet the following specified wind uplift design.
 1. Class 1, 1-90 windstorm construction.
- C. Certificate Of Analysis from the testing laboratory of the primary roofing materials manufacturer, confirming the physical and mechanical properties of the roofing membrane components. Testing shall be in accordance with the parameters published in ASTM D 5147 and ASTM D 7051 and indicate Quality Assurance/Quality Control data as required to meet the specified properties. A separate Certificate Of Analysis for each production run of material shall indicate the following information:

- a) Material type
- b) Lot number
- c) Production date
- d) Dimensions and Mass (indicate the lowest values recorded during the production run);
 - Roll length
 - Roll width
 - Selvage width
 - Total thickness
 - Thickness at selvage (coating thickness)
 - Weight
- e) Physical and Mechanical Properties;
 - Low temperature flexibility
 - Peak load
 - Ultimate Elongation
 - Dimensional stability
 - Compound Stability
 - Granule embedment
 - Resistance to thermal shock (foil faced products)

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: 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.
- B. Storage: Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer.
 - 1. Protect stored liquid material from direct sunlight, heat, open fire, ignition sources, oxidizing agents, strong acids, and strong alkalis.
 - 2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protection: Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with the insulation manufacturer's written instructions for handling, storing, and protecting materials during installation.
- D. Handling: Handle and place roofing materials and equipment in a manner to avoid permanent deflection of deck.

1.12 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed in accordance with manufacturer's written instructions and warranty requirements.
- B. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
- C. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
- D. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.
- E. Torch Safety: Crew members handling torches shall be trained by an Authorized Certified Roofing Torch Applicator (CERTA) Trainer, be certified according to CERTA torch safety guidelines as published by the National Roofing Contractors Association (NRCA), and follow torch safety practices as required by the contractor's insurance carrier. Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas during roof construction activity, and for the minimum period required by CERTA guidelines after roofing material application has been suspended for the day.

1.13 GUARANTEE

- A. Manufacturer's Guarantee: Provides that the Manufacturer will repair leaks through the covered roofing materials due to material or workmanship defects, subject to certain exclusions, during the specified time period. Refer to guarantee for complete coverage and restrictions.
 - 1. The Guarantee shall provide coverage for the roofing membrane and base flashings. The Guarantee shall be non-prorated and contain no deductibles or limitations on coverage amount.
 - 2. Guarantee Period : 20 Years from date of Substantial Completion.
- B. Roof Membrane Guarantee Addendum: In addition to the specified guarantee under section 07 52 00, furnish the Owner with the roofing manufacturer's inclusion addendum to the guarantee offering coverage of the factory fabricated gravel stop systems specified in Section 07 71 00 under the standard terms of the roofing membrane/system guarantee.
 - 1. Siplast Paraguard Roof Perimeter System Inclusion Addendum
- C. Special Project Guarantee Addendum: Provide addendum confirming that the roofing manufacturer's guarantee limitation of damages; mediation; jurisdiction;

choice of law must commence or prosecute before a state or federal court in the location indicated below.

1. State of Louisiana.

D. Roofing Contractors Project Warranty: Submit roofing contractor's warranty signed by the Installer, including all components of the roofing and insulation system for the following warranty period:

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 PRODUCT SURFACING/COATING:

2.1 MANUFACTURERS

A. Manufacturer: A roof system by the following manufacturer is approved for application.

1. Basis of Design Product: Siplast, Inc., prior approved equal only, Bidder must complete and submit Request Form at end of this Section. An approved equal Must be listed as approved in an addendum. No equals will be considered or allowed after the Bid Event.

2.2 ROOFING MEMBRANE SHEET MATERIALS

A. A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend. The cross sectional area of the sheet material shall contain no oxidized or non-SBS-modified bitumen. The back of modified bitumen base ply shall be coated with factory applied polymer modified asphalt self-adhesive coating covered with a removable film. The modified bitumen finish ply shall be coated on one side with a high quality torch grade SBS bitumen blend. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147.

> Siplast Paradiene 20 /30 FR roof system

1. Modified Bitumen Base

- a) Thickness (avg): 114 mils (2.9 mm) (ASTM D 5147)
- b) Thickness (min): 110 mils (2.8 mm) (ASTM D 5147)
- c) Weight (min per 100 ft² of coverage): 76 lb (3.7 kg/m²)
- d) Maximum filler content in elastomeric blend: 35% by weight
- e) Low temperature flexibility @ -15°F (-26°C): PASS (ASTM D 5147)

- f) Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
 - g) Peak Load (avg) @ 0°F (-18°C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
 - h) Ultimate Elongation (avg.) @ 73°F (23°C): 80% (ASTM D 5147)
 - i) Dimensional Stability (max): 0.1% (ASTM D 5147)
 - j) Compound Stability (min): 250°F (121°C) (ASTM D 5147)
 - k) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - l) Reinforcement: fiberglass mat meeting the performance and dimensional stability criteria
 - > Siplast Paradiene 20 TG - torchable grade
2. Modified Bitumen Stripping Ply at Gravel Stop
- a) Thickness (avg): 138 mils (3.5 mm) (ASTM D 5147)
 - b) Thickness (min): 134 mils (3.4 mm) (ASTM D 5147)
 - c) Weight (min per 100 ft² of coverage): 96 lb (4.7 kg/m²)
 - d) Peak filler content in elastomeric blend - 35% by weight
 - e) Low temperature flexibility @ -13°F (-25°C): PASS (ASTM D 5147)
 - f) Peak Load (avg) @ 73°F (23°C): 80 lbf/inch (14.1 kN/m) (ASTM D 5147)
 - g) Peak Load (avg) @ 0°F (-18°C): 150 lbf/inch (26.5 kN/m) (ASTM D 5147)
 - h) Ultimate Elongation (avg.) @ 73°F (23°C): 100% (ASTM D 5147)
 - i) Compound Stability (max): 0.1% (ASTM D 5147)
 - j) High Temperature Stability (min): 250°F (121°C) (ASTM D 5147)
 - k) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - l) Reinforcement: fiberglass mat meeting the performance and Compound stability criteria
 - > Siplast Paradiene 20 EG TG - torchable grade
3. Modified Bitumen Finish Ply
- a) Thickness (avg): 138 mils (3.5 mm) (ASTM D 5147)
 - b) Thickness at selvage (coating thickness) (avg): 118 mils (3.0 mm) (ASTM D 5147)
 - c) Thickness at selvage (coating thickness) (min): 114 mils (2.9 mm) (ASTM D 5147)
 - d) Weight (min per 100 ft² of coverage): 112 lb (5.4 kg/m²)
 - e) Maximum filler content in elastomeric blend: 35% by weight
 - f) Low temperature flexibility @ -15°F (-26°C): PASS (ASTM D 5147)
 - g) Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
 - h) Peak Load (avg) @ 0°F (-18°C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
 - i) Ultimate Elongation (avg.) @ 73°F (23°C): 80% (ASTM D 5147)
 - j) Dimensional Stability (max): 0.1% (ASTM D 5147)
 - k) Compound Stability (min): 250°F (121° C) (ASTM D 5147)
 - l) Granule Embedment (max loss): 2.0 grams per sample (ASTM D 5147)
 - m) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - n) Reinforcement: fiberglass mat meeting the performance and dimensional stability criteria
 - o) Surfacing: ceramic granules
 - > Siplast Paradiene 30 FR TG - torchable grade

B. A flashing membrane assembly consisting of a liquid applied, flexible, monolithic membrane formed by the combination of PMMA-based resin and fleece fabric. The stripping ply and flashing reinforcing sheet shall consist of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane. The reinforcement mat in the SBS ply shall be impregnated/saturated and coated each side with an SBS modified bitumen blend. The cross sectional area of the SBS sheet material shall contain no oxidized or non-SBS modified bitumen. The back of the modified bitumen base ply shall be coated with factory-applied polymer-modified asphalt self-adhesive coating covered with a removable film. The top surface of the modified bitumen ply sheet shall be coated with a white acrylic coating to enhance resin bond and to minimize surface temperatures.

> Siplast Parapro 123 Flashing System

1. Self-Adhesive Modified Bitumen Stripping Ply and Flashing Reinforcing Sheet

- a) Thickness (avg): 102 mils (2.6 mm) (ASTM D5147)
- b) Thickness (min): 98 mils (2.5 mm) (ASTM D5147)
- c) Weight (min per 100 ft² of coverage): 69 lb (3.4 kg/m²)
- d) Maximum filler content in elastomeric blend: 35% by weight
- e) Low temperature flexibility @ -15° F (-26° C) - PASS (ASTM D5147)
- f) Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D5147)
- g) Peak Load (avg) @ 0°F (-18°C): 75 lbf/inch (13.2 kN/m) (ASTM D5147)
- h) Ultimate Elongation (avg.) @ 73°F (23°C): 50% (ASTM D5147)
- i) Dimensional Stability (max): 0.1% (ASTM D5147)
- j) Compound Stability (min - sheet): 250°F (121°C) (ASTM D5147)
- k) Compound Stability (min – adhesive coating): 212°F (100°C) (ASTM D5147)
- l) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
- m) Reinforcement: fiberglass mat meeting the performance and dimensional stability criteria
- n) Back Surfacing: polyolefin release film
- o) Top Surfacing: factory applied acrylic coating
 - > Siplast Pro Base SA

2. Resin for Flashing Applications: A flexible, PMMA-based resin combined with a thixotropic agent for use in combination with non-woven, 110 g/m², needle-punched polyester fabric reinforcement to form a monolithic, reinforced flashing membrane.

> Siplast Parapro Flashing Resin

3. Fleece for Flashing Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the membrane system manufacturer.

> Siplast Pro Fleece

2.3 PRIMERS

- A. Primer for Self-Adhesive Membranes: Primer for self-adhesive membranes shall be a single component, water-based resinous primer formulated to condition masonry, wood, plywood, concrete, asphaltic, and gypsum surfaces to facilitate adhesion of self-adhesive membranes.
1. Siplast TA-119 Primer

2.4 AUXILIARY ROOFING MATERIALS

- A. Asphalt Roofing Cement: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D4586 Type II requirements.
1. Siplast PA-1021 Plastic Cement
- B. Flashing Cement: A single-component, moisture curing, low-odor adhesive formulated in a grade for application of flashing materials.
1. Siplast SFT Cement
- C. Sealant: A moisture-curing, self-leveling elastomeric sealant designed for roofing applications.
1. Siplast PS-209 Elastomeric Sealant
- D. Sealant: A moisture-curing, non-slumping elastomeric sealant designed for roofing applications.
1. Siplast PS-715 NS Elastomeric Sealant
- E. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.
- F. Paraguard Roof Perimeter System: Reference separate specification 07 71 00-1

2.5 COVER PANEL

- A. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of ¼ inch. The panel surface shall be factory primed with non-asphaltic primer. Acceptable types are as follows:
1. Georgia Pacific DensDeck Prime Gypsum Roof Board.

2.6 INSULATION ACCESSORIES

- A. Insulation Adhesive: single or dual component low-rise polyurethane foam adhesive designed specifically for the adhesion of roof insulation to substrate,

as well as subsequent layers of insulation. Acceptable manufacturers are as follows:

1. Siplast Para-Stik
- B. Insulation Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders, meeting ASTM C728 criteria. The top surface shall be pre-treated with an asphalt based coating. The face of the cant shall have a nominal 4 inch dimension.
- C. Tapered Edge Strips: A tapered panel composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The panels shall have a dimension sufficient to provide for a smooth transition and provide proper support for the membrane layer or subsequent layer of insulation when there are transitions of 1/4 inch or greater.

2.7 WALKWAYS

- A. Walktread: A granule-surfaced polymer modified bitumen sheet material reinforced with a prefabricated, puncture resistant polyester core, having a thickness of 0.217 in (5.5 mm) and a width of 30 inches (76.2 cm).
 1. Siplast Paratread

PART 3 EXECUTION

3.1 EXAMINATION

- A. Substrate Qualification: The installing contractor shall examine all substrates where the specified roofing and flashing system will be applied and confirm their suitability to receive the specified roofing materials.

3.2 PREPARATION

- A. Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.
- B. Remove all of the following existing conditions:
 1. Wet/damaged/deteriorated membrane
 2. Base flashings
 3. Flanged metal flashings
 4. Walkways
 5. Nonfunctional penetrations/curbs
 6. Metal trim, counter flashing
- C. Primer for Self-Adhesive Flashing Reinforcing Ply: Apply the specified tacky primer by roller or spray in an even film. Refer to the manufacturer's literature for the approved rate of application over various substrate types. Allow the primer to dry until it leaves a slightly sticky surface without transfer when touched. Cutting or alteration of the primer is not permitted.

- D. Asphaltic Primer: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer according to the manufacturer's published application rate. Cutting or alteration of the primer is not permitted.

3.3 INSTALLATION OF ROOFING, GENERAL GUIDLEINES

- A. General Appearance: Ensure that the finished roofing application has an aesthetically pleasing overall appearance and is acceptable to the Owner.

3.4 INSTALLATION OF COVERBOARD

- A. Install cover panels with end joints offset with edges in moderate contact in accordance with the insulation manufacturer's requirements. Install only as much cover panels as can be made watertight within the same work day.
- B. Crickets: Construct crickets of tapered insulation panels in a layout as indicated on the roof plan.
- C. Tapered Edge at Transitions: Field-cut, shape and install tapered edge strip at transitions of 1/4 inch or greater between substrate components to provide a smooth transition and proper support for the subsequent insulation layer or membrane/flashing system components.
- D. Coverboard: Install all layers in an application of the specified insulation adhesive in $\frac{3}{4}$ to 1 inch wide beads spaced 12 inches on center in the field of the roof, 8 inches on center at the perimeter of the roof, and 6 inches on center in the corners of the roof. Panels may be affected by post-growth of the insulation adhesive. Continuous walking in of the panels is recommended particularly in perimeter/corner areas with reduced bead spacing. Follow the requirement and guidelines of the insulation adhesive manufacturer/supplier.

3.5 APPLICATION OF BITUMINOUS ROOFING MEMBRANE

- A. Apply all layers of roofing with side laps running perpendicular to the direction of the slope. Exert sufficient pressure on the roll during application to ensure prevention of air pockets, wrinkles, creases or fishmouths. Refer to the manufacturer's guidelines for maximum sheet lengths and special fastening of the head laps where the roof deck slope exceeds 1/2 inch per foot.
- B. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.

- C. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.

3.6 APPLICATION OF FLASHING AND STRIPPING

- A. Modified Bitumen Flashing System: Apply the specified base flashing materials in accordance with the manufacturer's standard details. Notify the design team immediately of any flashing heights below 8 inches. For torch applied base flashings, apply a 12-inch self-adhesive cant backing sheet extending 6 inches onto the field of the roof area and a minimum of 6 inches up the vertical surface utilizing minimum 3 inch laps. Set the non-combustible cant into place dry prior to installation of the roof membrane base ply and subsequent flashing system. Flash walls and curbs using the reinforcing sheet and flashing membrane. Exert pressure using a neoprene roller on the flashing sheet during application to ensure complete contact with the vertical/horizontal surfaces, preventing air pockets. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See the manufacturer's schematic for visual interpretation).
- B. Liquid Flashing System: Install the specified liquid-applied flashing system in accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.

3.7 APPLICATION OF SEALANT

- A. Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.8 APPLICATION OF WALKTREAD

- A. Cut the specified walktread into maximum 5 foot lengths and allow to relax until flat. Adhere the sheet using the specified plastic cement. Apply the specified cement in a 3/8 inch thickness to the back of the product in 5 inch by 5 inch spots in accordance with the pattern as supplied by the walktread manufacturer. Walk-in each sheet after application to ensure proper adhesion. Use a minimum spacing of 2 inches between sheets to allow for proper drainage.

3.9 INSTALLATION OF PERIMETER EDGE SYSTEM

- A. Reference separate specification 07 71 00-1 for the installation instructions.

3.10 FIELD QUALITY CONTROL

- A. Notify the manufacturer of job completion in order to schedule a final inspection date. 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 manufacturer's representative. Complete, sign, and send the punch list form to the manufacturer's headquarters.
- B. Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.
- C. Complete all post installation procedures and meet the manufacturer's requirements for issuance of the specified guarantee.

SUBSTITUTION REQUEST FORM

PROJECT NAME: _____ LOCATION: _____

MANUFACTURER: _____ SYSTEM NAME: _____

ASTM test result evaluation:

Provide official laboratory results demonstrating compliance to the following requirements.

Minimum Physical and Mechanical Properties

MATERIAL PROPERTY	PRODUCT NAME	STANDARD METHOD	CRITERIA	TEST RESULT
GRANULE EMBEDMENT – As granule loss occurs, bitumen may be exposed to UV causing premature aging of the sheet				
FINISH PLY		ASTM D 5147	Maximum 1.5 grams loss average result, and 2.0 grams loss per individual specimen	
DIMENSIONAL STABILITY - Dimensional stability is directly related to membrane shrinkage. Related problems include but are not limited to, lap shear stress, wrinkling, ridging, stress at flashing, and potential areas of SBS bitumen exposed to UV.				
BASE PLY		ASTM D 5147	Maximum 0.5%	
STRIPPING PLY		ASTM D 5147	Maximum 0.5%	
FINISH PLY		ASTM D 5147	Maximum 0.5%	
REINFORCING PLY		ASTM D 5147	Maximum 0.5%	
FLASHING SHEET		ASTM D 5147	Maximum 0.5%	

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SBS-MODIFIED BITUMEN CROSS SECTION – When oxidized asphalt is used to saturate reinforcement, there is a reduction in performance. All oxidized bitumen continues to oxidize over time.				
BASE PLY		UV Fluorescence microscopy	Only SBS-modified bitumen in the sheet cross-section (top-to-bottom)	
STRIPPING PLY		UV Fluorescence microscopy	Only SBS-modified bitumen in the sheet cross-section (top-to-bottom)	
FINISH PLY		UV Fluorescence microscopy	Only SBS-modified bitumen in the sheet cross-section (top-to-bottom)	
REINFORCING PLY		UV Fluorescence microscopy	Only SBS-modified bitumen in the sheet cross-section (top-to-bottom)	
FLASHING SHEET		UV Fluorescence microscopy	Only SBS-modified bitumen in the sheet cross-section (top-to-bottom)	

LOW TEMPERATURE FLEXIBILITY – As manufactured, or unaged, products with high quality SBS blend should exhibit low temperature flexibility numbers below 0°F.				
BASE PLY		ASTM D 5147	Pass 0°F before and after aging.	
STRIPPING PLY		ASTM D 5147	Pass 0°F before and after aging.	
FINISH PLY		ASTM D 5147	Pass 0°F before and after aging.	
REINFORCING PLY		ASTM D 5147	Pass 0°F before and after aging.	
FLASHING SHEET		ASTM D 5147	Pass 0°F before and after aging.	
ULTIMATE ELONGATION (ELONGATION AT 5% PEAK LOAD) – It is a good indicator of SBS blend quality for most glass reinforced materials.				
BASE PLY		ASTM D 5147	80% (unaged)	
STRIPPING PLY		ASTM D 5147	100% unaged)	
FINISH PLY		ASTM D 5147	80% (unaged)	
REINFORCING PLY		ASTM D 5147	80% (unaged)	

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FLASHING SHEET		ASTM D 5147	45% (unaged)	
RESISTANCE TO CYCLIC FATIGUE – Test method provides data on classifying polymer-modified bituminous membranes by their performance related to the fatigue conditions to which they are subjected.				
COMPOSITE ASSEMBLY (BASE AND FINISH PLIES TOGETHER)		ASTM D 5849, condition 4	Pass 500 cycles new, 200 cycles aged	
COMPOUND STABILITY – <u>This test is a measure of the modified bitumen blend’s resistance to flow at high temperature.</u>				
BASE PLY		ASTM D 5147	>225 F	
STRIPPING PLY		ASTM D 5147	>225 F	
FINISH PLY		ASTM D 5147	>225 F	
REINFORCING PLY		ASTM D 5147	>225 F	
FLASHING SHEET		ASTM D 5147	>225 F	
FILLER CONTENT – <u>Asphalt, filler, and SBS ratios can vary within reasonable limits creating different high performance formulations. The key is that the chemical integrity of the asphalt/SBS mixture must be invariable day-to-day, batch-to-batch</u>				
BASE PLY		<u>Wet lab separation.</u>	<35% by weight	
STRIPPING PLY		<u>Wet lab separation.</u>	<35% by weight	
FINISH PLY		<u>Wet lab separation.</u>	<35% by weight	
REINFORCING PLY		<u>Wet lab separation.</u>	<35% by weight	
FLASHING SHEET		<u>Wet lab separation.</u>	<35% by weight	
Hail Rating – <u>Provides assurance of adequate puncture resistance of roof membrane.</u>				
FINISH PLY		FM 4470	SH (Severe Hail)	

Please note: Important statement of product quality compliance.

We reserve the right to take sample rolls from the project job site to perform independent laboratory testing to verify compliance. If rolls do not meet the specified test results the roofing manufacturer agrees to pay for testing expense, removal and replacement of out of specification material; this includes paying for materials, freight, labor, and all associated costs. Submittal of substitution request signifies agreement with this requirement.

I, AS A CERTIFIED INSTALLER OF THE ABOVE-REFERENCED ROOF MEMBRANE SYSTEM, HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT AND I AGREE WITH THE PRODUCT QUALITY COMPLIANCE STATEMENT LISTED ABOVE. 2

SIGNATURE: _____ DATE: _____

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COMPANY NAME: _____ TITLE: _____

PHONE: _____

END OF SECTION 07 52 00

SECTION 076200 –

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Formed wall sheet metal fabrications.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
 2. Distinguish between shop- and field-assembled work.
 3. Include identification of finish for each item.
 4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.
- C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653, G90 coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792, Class AZ50 coating designation, Grade 40; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - b. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - c. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.

2. Color: Match existing

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal[**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 and recommended by manufacturer of primary sheet metal[**or manufactured item**].
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 2. Fasteners for Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153 or ASTM F 2329.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric [**polyurethane**] [**polysulfide**] [**silicone**] polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 1. Obtain field measurements for accurate fit before shop fabrication.

2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- C. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate non-moving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings; and form with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:
1. Stainless Steel: 0.016 inch thick.
- B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high, end dams. Fabricate from the following materials:
1. Copper: 16 oz./sq. ft.
 2. Aluminum: 0.032 inch thick.
 3. Stainless Steel: 0.016 inch thick.
 4. Galvanized Steel: 0.022 inch thick.
 5. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- C. Wall Expansion-Joint Cover: Fabricate from the following materials:
1. Copper: 16 oz./sq. ft..

2. Aluminum: 0.040 inch thick.
3. Stainless Steel: 0.019 inch thick.
4. Galvanized Steel: 0.028 inch thick.
5. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

- F. Seal joints as required for watertight construction.
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.2 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Through-Wall Flashing: Installation of through-wall flashing as specified.
- C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Preparation of surfaces to receive factory fabricated metal perimeter systems.
- B. Installation of factory fabricated and finished metal perimeter systems.

1.2 REFERENCE STANDARDS

- NRCA National Roofing Contractors Association
Rosemont, IL
- OSHA Occupational Safety and Health Administration
Washington, DC
- SMACNA Sheet Metal and Air Conditioning Contractors National Association
Chantilly, VA
- FM Factory Mutual Engineering and Research
Norwood, MA
- ANSI American National Standards Institute
Washington, DC
- SPRI Single Ply Roofing Industry
Waltham, MA
- NOA Miami-Dade
Miami Dade County, FL

1.3 SUBMITTALS

- A. Submittals Prior to Contract Award:
 - 1. Submit a letter from the roofing membrane manufacturer confirming that the factory fabricated metal accessory systems furnished for the project are supplied or manufactured by the roofing membrane manufacturer and that each component section is embossed with the roofing membrane manufacturer's logo.

2. Latest edition of factory fabricated metal component manufacturer/supplier's installer's guide for factory fabricated metal perimeter systems.
3. Samples from the manufacturer/supplier sized to represent metal components.
4. Copies of the manufacturer/supplier's color selection chart showing the manufacturer/supplier's full range of standard colors as well as physical samples of each standard color.
5. Sample copy of the roofing system manufacturer's inclusion addendum offering coverage of the factory fabricated metal perimeter systems as part of the roofing membrane system.

1.4 QUALITY ASSURANCE

- A. Agency Approvals: The proposed factory fabricated metal component shall conform to the following requirements. No other testing agency approvals will be accepted.
 1. The roof perimeter coping system shall be certified through third party verification by the manufacturer/supplier to meet performance design criteria according to the most recent edition of ANSI/SPRI/FM 4435/ES-1: Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
 2. The Drip Edge shall meet an FM rating for 24 gauge material, having a maximum face dimension of equal to 6 inches and not exceeding 10 inches:
Perimeter 1-285 and Corner 1-225.
- B. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the factory fabricated metal installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer/supplier of the factory fabricated metal components.
- C. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.
- D. Manufacturer Requirements:
 1. Ensure that the factory fabricated metal components are labeled with the roofing membrane manufacturer's logo.
 2. Ensure that the factory fabricated metal component manufacturer/supplier provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

1.5 PRODUCT DELIVERY STORAGE AND HANDLING

- A. Delivery: Deliver materials in the manufacturer's original packaging.
- B. Storage: Store materials out of direct exposure to the elements.
- C. Strippable Film Masking: Do not remove the strippable film masking on the metal component until immediately following installation. Do not allow extended UV or heat exposure to metal components covered with strippable film masking.
- D. Damaged Material: Any materials that are found to be damaged will be automatically rejected, removed and replaced at the Contractor's expense.

1.6 PROJECT/SITE CONDITIONS

- A. Requirements Prior to Job Start
 - 1. Related Work: Verify that all related work performed by other trades is complete prior to installing the factory fabricated metal components.
 - 2. Component Substrate Condition: Mounting surfaces shall be straight and secure and provide adequate widths to properly support the factory fabricated metal components.
 - 3. Safety: Familiarize every member of the application crew with all safety regulations recommended by OSHA, SMACNA and other industry or local governmental groups.
- B. Protection Requirements
 - 1. Component Protection: Protect newly applied factory fabricated metal component surfaces against mechanical damage.
 - 2. Limited Access: Prevent access by the public to materials, tools and equipment during the course of the project.
 - 3. Debris Removal: Remove all debris daily from the project site.
 - 4. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by construction.

1.07 GUARANTEE/ ADDENDUM

- A. Roof Membrane Guarantee Addendum: In addition to the specified guarantee under section 07 52 00, furnish the Owner with the roofing manufacturer's inclusion addendum to the guarantee offering coverage of the factory fabricated gravel stop, systems under the standard terms of the roofing membrane/system guarantee.
 - > Siplast Paraguard Roof Perimeter System Inclusion Addendum

PART 2 PRODUCTS

2.1 DESCRIPTION OF FACTORY FABRICATED METAL SYSTEMS

- A. Factory Fabricated Gravel Stop: Factory fabricated gravel stop components shall be factory formed according to the requirements of the membrane manufacturer and labeled with the roofing manufacturer's logo. The gravel stop system shall consist of the following components:
- A factory formed cleat with pre-punched nail holes fabricated from 22 gauge, G90 galvanized steel, secured using galvanized ringshank roofing nails.
 - A factory formed gravel stop with pre-punched nailing holes, secured using galvanized roofing nails. fabricated from minimum 24 gauge galvanized steel having a mill coil coated Kynar™ or spray coated Kynar™ finish.
 - Factory formed concealed splice plates.
 - Factory formed welded miters, cant closures, end terminations..
 - > Proform Drip Edge Gravel Stop, by Siplast, Inc., Dallas, TX (800) 922-8800

PART 3 EXECUTION

3.1 SUBSTRATE PREPARATION

- A. Perimeter Nailers: Perimeter nailers shall be flat and level to the building perimeter edge. The front edge of the nailer must be flush with the outside face or wall of the building. Anchor all perimeter nailers in strict accordance with the guidelines set forth in FM Global Property Loss Prevention Data Sheet 1-49.
- B. Curbs for Expansion Joint Components: Curbs must be straight, level, and properly anchored to the building structural deck. Any curbs, which are improperly installed or anchored, must be corrected prior to installation of the expansion joint systems.
- C. Flashing Membrane Installation: Ensure that all roofing flashing treatments used in conjunction with factory fabricated metal components are installed according to the roofing membrane manufacturer's specifications, current technical guide, and details prior to installation of the factory fabricated metal component.
- D. Surface Cleaning: Sweep or vacuum all surfaces to receive the metal components, removing all loose aggregate, soil, and foreign substances prior to installation of the factory fabricated metal components.

3.2 FACTORY FABRICATED METAL COMPONENT INSTALLATION

- A. Install metal components in accordance with the roofing/waterproofing manufacturer's instructions and the following requirements.
- B. Factory Fabricated Gravel Stop
 - 1. Place the continuous retainer cleat to the roofing surface firmly against the perimeter nailer. The retainer cleat should be level and the nailing slots should align centered with the nailer underneath. Fasten the retaining cleat in accordance with the gravel stop system manufacturer's installation instructions.
 - 2. Starting at the corners, trowel a bead of the roofing manufacturer's specified mastic over the base ply of membrane where the flange of the exterior fascia is to be set. Hook the drip edge of the exterior fascia over the retainer cleat and fasten the flange through the pre-punched holes in accordance with the gravel stop system manufacturer's installation instructions. Slide a concealed joint splice plate halfway into the fascia to allow the next section to fit halfway over the joint splice plate as well. Allow a 3/8 inch gap between gravel stop sections for thermal movement.
 - 3. After installation of the factory fabricated gravel stop is complete, ensure that the roofing stripping and finish plies are installed in accordance with the roofing membrane manufacturer's specifications and details.

3.03 FIELD QUALITY CONTROL AND INSPECTIONS

- A. Site Condition: Leave all areas around the job site free of debris, construction materials, equipment and related items after completion of job.
- B. Issuance Of The Addendum to the Roofing Membrane/System Guarantee: Complete all post installation procedures and meet the factory fabricated metal manufacturer/supplier's final endorsement for issuance of the addendum to the specified roofing/waterproofing guarantee.

END OF SECTION 07 71 00

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints in glass unit masonry assemblies.
 - c. Joints between metal panels.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - f. Control and expansion joints.
 - g. Other joints as indicated.
 2. Exterior joints in the following horizontal traffic surfaces:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Tile control and expansion joints.
 - c. Joints between different materials listed above.
 - d. Other joints as indicated.
 3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of walls and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors, windows.
 - f. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - g. Other joints as indicated.

4. Interior joints in the following horizontal traffic surfaces:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- F. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- G. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- H. Field Test Report Log: For each elastomeric sealant application.

- I. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- J. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
 - 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
 - 4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- F. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
 2. Nonmembrane Roof Sealants: 300 g/L.
 3. Single-Ply Roof Membrane Sealants: 450 g/L.
 4. Sealant Primers for Nonporous Substrates: 250 g/L.
 5. Sealant Primers for Porous Substrates: 775 g/L.
 6. Modified Bituminous Sealant Primers: 500 g/L.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- E. Preformed Foam Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant that is manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent; is factory produced in precompressed sizes in roll or stick form to fit joint widths indicated; is coated on one side with a pressure-sensitive adhesive and covered with protective wrapping; develops a watertight and airtight seal when compressed to the degree specified by manufacturer; and complies with the following:
1. Available Products:
 - a. EMSEAL Joint Systems, Ltd.; Emseal 25V.
 - b. illbruck Sealant Systems, Inc.; Wilseal 600.
 - c. Polytite Manufacturing Corporation; Polytite B.
 - d. Polytite Manufacturing Corporation; Polytite Standard.

- e. Sandell Manufacturing Co., Inc.; Polyseal.
2. Properties: Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.

2.4 PREFORMED TAPE SEALANTS

- A. Back-Bedding Mastic Tape Sealant: Preformed, butyl-based elastomeric tape sealant with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Tape Sealant: Closed-cell, PVC foam tape sealant; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 1. Type 1, for applications in which tape acts as the primary sealant.
 2. Type 2, for applications in which tape is used in combination with a full bead of liquid sealant.

2.5 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials

or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.

- c. Unglazed surfaces of ceramic tile.
- 3. Remove laitance and form-release agents from concrete.
- 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates , where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.
- I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
- J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
 2. Test Method: Test joint sealants according to as appropriate for type of joint-sealant application indicated.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
 4. Inspect tested joints and report on the following:
 - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
 5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
 6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A . Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

DIVISION **23**

HEATING VENTILATING AND AIR CONDITIONING



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SECTION 230500
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Mechanical demolition.
 - 2. Equipment installation requirements common to equipment sections.
 - 3. Supports and anchorages.

- B. All systems provided shall be complete and operational. Refer to complete specifications and drawings for additional detailed requirements. Manufacturers recommended installation guidelines shall be used if no other specific direction is given. Bidder shall be responsible to coordinate and include in his bid all necessary appurtenances and additional material to ensure proper installation and function. All bidders shall be responsible to review the complete set of specifications, drawings and addendums.

1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 QUALITY ASSURANCE

- A. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If

minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 JOINING MATERIALS

- A. Refer to individual sections for special joining materials not listed below.
- B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- D. Brazing Filler Metals: AWS A5.8, BCuP Series or BAgl, unless otherwise indicated.
- E. Solvent Cements for Joining Plastic Piping:
 - 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - 2. PVC to ABS Piping Transition: ASTM D 3138.

2.2 SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
- B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

2.3 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- C. PVC Pipe: ASTM D 1785, Schedule 40.

PART 3 - EXECUTION

3.1 MECHANICAL DEMOLITION

- A. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.

1. Piping and tubing to be removed: Remove piping and tubing as required for demolition and installation of equipment. Temporarily cap or plug remaining piping and tubing with same or compatible piping material to prevent dirt or moisture migration.
 2. Ducts to Be Removed: Remove ducts indicated to be removed by limits of construction or demolition.
 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
- B. If pipe, tubing, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality at no charge to contract.
- C. Remove all piping, tubing, ductwork and components related to the mechanical system being demolished. Do not abandon existing mechanical components or systems in place.

3.2 PIPING AND TUBING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping and tubing according to the following requirements and other applicable sections.
- B. Install piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- C. Install piping to permit valve servicing.
- D. Install piping with a slope to drain.
- E. Install piping free of sags and bends.
- F. Install fittings for changes in direction and branch connections.
- G. Install piping to allow application of insulation.
- H. Select system components with pressure rating equal to or greater than system operating pressure.
- I. Install escutcheons for penetrations of walls, ceilings, and floors.
- J. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
- K. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

- L. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.
- M. Verify final equipment locations for roughing-in.
- N. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPE AND TUBING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends.
- C. Clean, dehydrate and remove scale, slag, dirt, and debris from inside and outside of pipe, tubing and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - 3. PVC Nonpressure Piping: Join according to ASTM D 2855.

- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller at final connection to each piece of equipment.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.
- E. Install equipment to permit servicing of electrical panels per OSHA requirements.
- F. Place grout under supports for equipment and make smooth bearing surface.
- G. Install equipment in accordance with Manufacturer's recommendations.

3.6 ANCHORS

- A. Anchor equipment to concrete slab according to equipment manufacturer's written instructions.
 - 1. Remove existing anchors and repair slab prior to placing new equipment. Slab shall be flat and free of noticeable defects prior to placing equipment.
 - 2. Install epoxy-coated anchor bolts for equipment and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 5. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
 - 6. Use 3000-psi, 28-day compressive-strength concrete.

3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment or as required.
- B. Field Welding: Comply with AWS D1.1.

3.8 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION 230500

SECTION 23 31 13
METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes metal, rectangular ducts and fittings for supply, return, outside, and exhaust air-distribution systems in pressure classes from minus 1 to plus 3-inch WC
- B. See section "Duct Accessories" for terminals and registers.
- C. All systems provided shall be complete and operational. Refer to complete specifications and drawings for additional detailed requirements. Manufacturers recommended installation guidelines shall be used if no other specific direction is given. Bidder shall be responsible to coordinate and include in his bid all necessary appurtenances and additional material to ensure proper installation and function. All bidders shall be responsible to review the complete set of specifications, drawings and addendums.

1.2 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal ducts.
 - 1. Penetrations through fire-rated and other partitions.
 - 2. Duct accessories, including access doors and panels.

1.3 QUALITY ASSURANCE

- A. NFPA Compliance:
 - 1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
 - 2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

- B. Sheet Steel: Lock-forming quality; complying with ASTM A-653; ducts shall have mill-phosphatized finish for surfaces exposed to view.

2.2 SEALANT MATERIALS

- A. Joint and Seam Tape: 2 inches wide; glass-fiber-reinforced fabric.
- B. Tape Sealing System: Woven-fiber tape impregnated with gypsum mineral compound and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
- C. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.
- D. Solvent-Based Joint and Seam Sealant: One-part, non-sag, solvent-release-curing, polymerized butyl sealant.
- E. Flanged Joint Mastic: One-part, acid-curing, silicone, elastomeric joint sealant complying with ASTM C 920.
- F. Flange Gaskets: Butyl rubber or EPDM polymer.

2.3 HANGERS AND SUPPORTS

- A. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 2. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- B. Hanger Materials: Sheet steel or threaded steel rod.
 - 1. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards -Metal and Flexible" for steel sheet width and thickness and for steel rod diameters.
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes and plates complying with ASTM A-36.

2.4 RECTANGULAR DUCT FABRICATION

- A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.

1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
 2. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.
1. Manufacturers:
 - a. Ductmate Industries, Inc.
 - b. Nexus Inc.
 - c. Ward Industries, Inc.
- C. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.
1. Manufacturers:
 - a. Ductmate Industries, Inc.
 - b. Lockformer
 2. Duct Size: Maximum 36 inches wide and up to 2-inch wg pressure class.
 3. Longitudinal Seams: Pittsburgh lock sealed with non-curing polymer sealant.
- D. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of non-braced panel area unless ducts are lined.

2.5 ROUND DUCT FABRICATION

Prefabricated by United McGill or equivalent, rated for the application and working class specified.

PART 3 - EXECUTION

3.1 DUCT APPLICATIONS

- A. Static-Pressure Working Classes: Unless otherwise indicated, furnish/construct ducts according to the following:
1. Supply Ducts: 2-inch WC
 2. Return Ducts: (-)1-inch WC

3.2 DUCT INSTALLATION

- A. Construct and install ducts according to SMACNA's "HVAC Duct Construction Standards -Metal and Flexible," unless otherwise indicated.
- B. Install ducts with fewest possible joints and seams.
- C. Install fabricated fittings for changes in directions, size, and shape and for connections.
- D. Install couplings tight to duct wall surface with a minimum of projections into duct. Secure couplings with sheet metal screws. Install screws at intervals of 12 inches, with a minimum of three screws in each coupling.
- E. Install ducts, unless otherwise indicated, vertically and horizontally and parallel and perpendicular to building lines; avoid diagonal runs.
- F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- G. Install ducts with a clearance of 2 inches, plus allowance for insulation thickness.
- H. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions unless specifically indicated.
- I. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts, and similar finished work.
- J. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.
- K. Electrical Equipment Spaces: Route ducts to avoid passing through transformer vaults and electrical equipment spaces and enclosures.
- L. Fire-Rated Partition Penetrations: Where ducts pass through fire rated interior partitions and exterior walls, install appropriately rated fire dampers, sleeves, and fire-stopping sealant.
- M. Protect duct interiors from the elements and foreign materials until building is enclosed.

3.3 SEAM AND JOINT SEALING

- A. Operate system blower and examine ductwork for leakage. Seal duct seams and joints according to SMACNA's "HVAC Duct Construction Standards -Metal and Flexible" for duct pressure class indicated.

3.4 HANGING AND SUPPORTING

- A. Support horizontal ducts per SMACNA HVAC Duct standards within 24 inches of each elbow and within 48 inches of each branch intersection.

- B. Support vertical ducts at maximum intervals of 16 feet and at each floor.
- C. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.
- D. Install concrete inserts before placing concrete.
- E. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 1. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

3.5 CONNECTIONS

- A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

END OF SECTION 233113

SECTION 23 33 00
DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Volume dampers
 2. Turning vanes
 3. Duct-mounting access doors
 4. Flexible connectors
 5. Flexible ducts
 6. Duct accessory hardware

1.2 SUBMITTALS

- A. Product Data: For the following:
1. Volume dampers
 2. Turning vanes
 3. Duct-mounting access doors
 4. Flexible connectors
 5. Flexible ducts

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated.
- B. Sheet Steel: Lock-forming quality; complying with ASTM A-653; ducts shall have mill-phosphatized finish for surfaces exposed to view.
- C. Reinforcement Shapes and Plates: Steel reinforcement where installed on sheet metal ducts.

- D. Tie Rods: Steel, 1/4-inch minimum diameter for lengths 36 inches or less, 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 VOLUME DAMPERS

- A. Manufacturers:
 - 1. Air Balance, Inc.
 - 2. American Warming and Ventilating.
 - 3. Flexmaster U.S.A., Inc.
 - 4. McGill AirFlow Corporation.
 - 5. METALAIRE, Inc.
 - 6. Nailor Industries Inc.
 - 7. Penn Ventilation Company, Inc.
 - 8. Ruskin Company.
- B. General Description: Factory fabricated, with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.
- C. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, and suitable for horizontal or vertical applications.
 - 1. Steel Frames: Hat-shaped, galvanized sheet steel channels, minimum of 0.064 inch thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls and flangeless frames where indicated for installing in ducts.
 - 2. Roll-Formed Steel Blades: 0.064-inch thick, galvanized sheet steel.
 - 3. Blade Axles: Galvanized steel.
 - 4. Bearings: Oil-impregnated bronze.
- D. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch thick zinc-plated steel, and a 3/4-inch hexagon-locking nut. Include center hole to suit damper operating-rod size.

2.3 TURNING VANES

- A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for vanes and vane runners. Vane runners shall automatically align vanes.
- B. Manufactured Turning Vanes: Fabricate 1-1/2-inch wide, single vane, curved blades of galvanized sheet steel set 3/4 inch o.c.; support with bars perpendicular to blades set 2 inches o.c.; and set into vane runners suitable for duct mounting.
 - 1. Manufacturers:
 - a. Ductmate Industries, Inc.
 - b. Duro Dyne Corp.
 - c. METALAIRE, Inc.

2.4 DUCT-MOUNTING ACCESS DOORS

- A. General Description: Fabricate doors airtight and suitable for duct pressure class.
- B. Door: Double wall, duct mounting, and rectangular; fabricated of galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class. Include 1-by-1-inch butt or piano hinge and cam latches.
 - 1. Manufacturers:
 - a. American Warming and Ventilating.
 - b. Ductmate Industries, Inc.
 - c. Flexmaster U.S.A., Inc.
 - d. Greenheck.
 - 2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
 - 3. Provide number of hinges and locks as follows:
 - a. Less than 12 Inches Square: Secure with two sash locks.
 - b. Up to 18 Inches Square: Two hinges and two sash locks.
- C. Door: Double wall, duct mounting, and round; fabricated of galvanized sheet metal with insulation fill and 1-inch thickness. Include cam latches.
 - 1. Manufacturers:
 - a. Ductmate Industries, Inc.
 - b. Flexmaster U.S.A., Inc.
 - 2. Frame: Galvanized sheet steel, with spin-in notched frame.
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
- E. Insulation: 1-inch thick, fibrous-glass or polystyrene-foam board.

2.5 FLEXIBLE CONNECTORS

- A. Manufacturers:
 - 1. Ductmate Industries, Inc.
 - 2. Duro Dyne Corp.
 - 3. Ventfabrics, Inc.
- B. General Description: Flame-retardant or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
- C. Flexible Connector Fabric: Glass fabric double coated with neoprene.
 - 1. Minimum Weight: 26 oz./sq. yd.
 - 2. Tensile Strength: 480 lbf./inch in the warp and 360 lbf./inch in the filling.
 - 3. Service Temperature: Minus 40 to plus 200 degree F.

2.6 FLEXIBLE DUCTS

- A.]Manufacturers:
 - 1. Flexmaster U.S.A., Inc.
 - 2. Hart & Cooley, Inc.
 - 3. McGill AirFlow Corporation.
- B. Non-insulated-Duct Connectors: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm
- C. Insulated-Duct Connectors: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm.
- D. Flexible Duct Clamps: Nylon strap, in sizes 3 through 18 inches to suit duct size.

2.7 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION

- A. The final installation shall include all controls and appurtenances as required for a complete and functional system.
- B. Install duct accessories per drawings, manufacture's recommendations, applicable details in SMACNA's "HVAC Duct Construction Standards-Metal and Flexible" and ASHRAE standards.
- C. Install volume dampers in ducts with liner; avoid damage to and erosion of duct liner.
- D. Provide balancing dampers at points on supply and return systems where branches lead from larger ducts as required for air balancing.
- E. Provide test holes at fan inlets and outlets and elsewhere as indicated or required.

ST. TAMMANY PARISH SCHOOL BOARD
GYMNASIUM HVAC and ROOF REPLACEMENT AT COVINGTON ELEMENTARY SCHOOL
COVINGTON, LA

- F. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units as follows:
 - 1. As required for interior of ducts for cleaning; before and after each change in direction and at a maximum 50-foot spacing.
- G. Install the following sizes for duct-mounting, rectangular access doors:
 - 1. One-Hand or Inspection Access: 8 by 5 inches.
 - 2. Two-Hand Access: 12 by 6 inches.
 - 3. Head and Hand Access: 18 by 10 inches.
- H. Install the following sizes for duct-mounting, round access doors:
 - 1. One-Hand or Inspection Access: 8 inches in diameter.
 - 2. Two-Hand Access: 10 inches in diameter.
 - 3. Head and Hand Access: 12 inches in diameter.
- I. Install flexible connectors immediately adjacent to equipment in ducts associated with fans and motorized equipment supported by vibration isolators.
- J. Connect diffusers to ducts with maximum 96-inch lengths of flexible duct clamped or strapped in place. Where diffusers are noted to be replaced, replace existing flexible duct.
- K. Connect flexible ducts to metal ducts with draw bands.
- L. Install duct test holes as indicated and as required for testing and balancing purposes.

END OF SECTION 233300

SECTION 237416
ROOFTOP AIR HANDLING UNITS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish and install rooftop air handling units and accessories as shown on the plans and as specified herein.
- B. All systems provided shall be complete and operational. Refer to complete specifications and drawings for additional detailed requirements. Manufacturers recommended installation guidelines shall be used if no other specific direction is given. Bidder shall be responsible to coordinate and include in his bid all necessary appurtenances and additional material to ensure proper installation and function. All bidders shall be responsible to review the complete set of specifications, drawings and addendums.

1.02 REFERENCE PUBLICATIONS

- A. The following publications are incorporated by reference, and shall be the current issue at the time of bid:
 - 1. Air Conditioning, Heating and Refrigeration Institute (AHRI):
 - AHRI-210/240.....Performance Rating of Unitary Air Conditioning & Air-Source Heat Pump Equipment
 - AHRI-410.....Forced-Circulation Air-Cooling and Air-Heating Coils
 - AHRI-440Performance Rating of Fan-Coil Units
 - 2. Air Movement and Control Association (AMCA):
 - AMCA 300.....Reverberant Room Method for Sound Testing of Fans
 - 3. American Bearing Manufacturer's Association (AFBMA):
 - AFMBA Std 9.....Load Ratings and Fatigue Life for Ball Bearings
 - AFMBA Std 11.....Load Rating and Fatigue Life for Roller Bearings
 - 4. American Society for Testing and Materials (ASTM):
 - ASTM C 1071.....Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material)
 - ASTM F 872.....Filter Units, Air Conditioning: Viscous-Impingement Type, Cleanable

- 5. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE):
 - ASHRAE 52.1.....Gravimetric and Dust-Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter
 - ASHRAE 68.....Laboratory Method of Testing In-Duct Sound Power Measurement Procedures for Fans
- 6. National Fire Protection Association (NFPA):
 - NFPA 70.....National Electrical Code
 - NFPA 90A.....Installation of Air Conditioning and Ventilating Systems
- 7. Underwriters Laboratories (UL):
 - UL 586.....High Efficiency, Particulate, Air Filter Units
 - UL 900.....Test Performance of Air Filter Units

1.03 SUBMITTALS

- A. Product Data: Manufacturer's data to include the following:
 - 1. Air Handling Units
 - 2. Operation and maintenance data, including spare parts lists, and wiring diagrams.
 - 3. Product data for filter media, filter performance data, filter assembly, and filter frames.
 - 4. Duct Smoke Detectors
 - 5. Accessories
- B. Performance Data
 - 1. Coil Performance Data
 - 1. Fan performance data and fan curves.
 - 1. Filter media data including filter performance data and filter frames.
 - 2. Electrical requirements for power supply including wiring diagrams for interlock and control wiring. Clearly indicate factory-installed and field-installed wiring.
 - 3. Overall unit dimensions
 - 4. Operating Weight
 - 5.

PART 2 - PRODUCTS

2.01 ROOFTOP AIR HANDLING UNITS

- A. Manufacturers: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Trane Precedents Series
 - 2. Daikin; Units shall work with existing duct work. Contractor responsible for any/all modifications.

3. Carrier; Units shall work with existing duct work. Contractor responsible for any/all modifications.

B. Configuration:

Units shall be of the unitary horizontal rooftop configuration as described on the drawings. Units shall be single-zone, draw-through type with direct expansion (DX) cooling, two stage heat rated at 27 KW and a pleated filter section. Units shall include a base rail, constant volume fan, refrigerated coil, 2 compressor/2-stage cooling, airtight insulated casing, filters, access panels, condensate pan, vibration-isolators, and appurtenances as required for standalone operation. Each air handling unit shall have physical dimensions suitable to fit space allotted to the unit and shall have the capacity indicated on the drawings. Air handling units shall have published ratings based on tests performed according to ARI 430. Units will be configured for compatibility with a 24 VAC heat/cool thermostat. Units shall be configured for 208 VAC three phase power as noted on the drawings.

C. Casings:

Casing sections shall be double wall type, constructed of a minimum 18-gauge galvanized steel, or 18-gauge steel outer casing protected with a corrosion resistant paint finish. Inner casing of double-wall units shall be minimum 24-gauge galvanized steel. Casing shall be designed and constructed with an integral structural steel frame such that exterior panels are non-load bearing. Exterior panels shall be individually removable. Removal shall not affect the structural integrity of the unit. Casings shall be provided with inspection doors allowing field service for all components. Inspection and access doors shall be insulated, fully gasketed, double-wall type, of minimum 18-gauge outer and 24-gauge inner panels. Drain pans shall be double-bottom type constructed of 16 gauge-galvanized steel, double pitched to the drain connection. Drain pans shall be constructed watertight, treated to prevent corrosion, and designed for positive condensate drainage. Each casing section handling conditioned air shall be insulated with not less than 1" thick, 1-1/2-pound density coated fibrous glass material (or equivalent) having a thermal conductivity not greater than 0.23 Btu/hr.-SF-F. Factory applied fibrous glass insulation shall conform to ASTM C 1071, except that the minimum thickness and density requirements do not apply and shall meet the requirements of NFPA 90A. Unit wall shall be insulated and shall not sweat with interior air temperature of 50°F and exterior air at 95/78 FDB/FWB.

D. Refrigerant Circuits:

Units shall be configured with two (2) fully hermetic independent scroll compressors with dedicated refrigeration circuits. Compressors shall be protected from an over-temperature and over-ampereage condition by an internal, motor overload device. Compressor motors shall have internal line break thermal, current overload and high-pressure differential protection. Compressor shall be factory mounted on rubber grommets.

Refrigerant circuit shall include the following control, safety, and maintenance features:

- a. Thermostatic Expansion Valve (TXV) with removable power element to allow change out of power element and bulb without removing the valve body.
- b. Refrigerant filter drier - Solid core design.

c. Service gage connections on suction and discharge lines.

E. Coils:

Evaporator and condenser coils shall be AHRI-440 rated copper tube mechanically bonded to aluminum plate fin. Coils shall be leak tested to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested to 225 PSIG and pressure tested to 450 PSIG. Furnish refrigerant and oil.

F. Air Filters:

Filters shall be as described on the drawings. Air filters shall be listed according to requirements of UL 900. Air filters shall be provided with slide out filter racks. Filter holding frames shall be gasketed and fabricated from not lighter than 16-gauge sheet steel with rust-inhibitor coating. All joints shall be airtight. The filter section shall be constructed in a manner identical to the remainder of the unit casing with a side access door.

G. Fans:

Evaporator fan shall be fixed speed centrifugal air foil (AF) type. Condenser and evaporator fans and shafts shall be statically and dynamically balanced by the Manufacturer. Fans shall be mounted on steel shafts accurately ground and finished. Fan bearings shall be sealed against dust and dirt and shall be precision self-aligning ball or roller type. Bearings shall be permanently lubricated or lubricated type with lubrication fittings readily accessible. Fans shall be furnished with a corrosion resistant factory coating. Belt guards shall be the three-sided enclosed type with solid or expanded metal face. All belt drives shall be designed for not less than a 1.2 service factor based on motor nameplate rating. Evaporator fan motor sheaves shall be variable pitch. Variable pitch sheaves shall be selected to drive the fan at a speed that will produce the specified capacity when set at the approximate midpoint of the sheave adjustment. Motors for V-belt drives shall be provided with adjustable bases. Unit fan or fans shall be selected to produce the required capacity at the specified fan static pressure. Condenser fans shall be fixed speed axial with riveted or welded blades.

H. Accessories:

a. Duct Smoke Detectors: Provide addressable smoke detectors in accordance with the drawings, NFPA 90A and UL 268A.

Furnish duct smoke detector(s) with the following minimum features:

- Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
- Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore for normal operation.

- Integral Visual-Indicating Light: LED type, indicating detector with power-on status.
 - Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.
- b. Provide a UL rated factory mounted switch type disconnect with 120 VAC GFI convenience outlet. Utility connections will be through-the-base.
- c. Provide a compatible 24 VAC heat/cool thermostat with lockable cover.

PART 3 – EXECUTION

3.01 INSTALLATION

A. INSTALLATION

1. Install equipment per drawings, industry standards, applicable codes, and manufacturer's instructions.
2. Do not use units for temporary heating, cooling or ventilation prior to complete inspection and startup performed per this specification.
3. Install units with manufacturer's recommended clearances for access, coil pull, and fan removal.
4. Provide one complete set of filters for testing, balancing, and commissioning. Provide second complete set of filters at time of transfer to owner.
5. Install unit plumb, level and square. Connect piping and ductwork according to manufacturer's instructions.
6. Insulate plumbing associated with drain pan drains and refrigerant connections.
7. Install insulation on all staggered coil tubing/piping connections.
8. Controls: Furnish 24 VAC thermostat with lockable cover, compatible with unit.
9. Duct Smoke Detector(s): Smoke detectors shall be interfaced and configured with the existing fire alarm panel.
10. All damaged surfaces of installed units shall be touched up to original factory finish.

B. START-UP

A Manufacturer's factory-trained and factory-employed service technician shall startup the AHU's

Technician shall perform the following steps as a minimum:

1. Energize the unit disconnect switch.
2. Verify correct voltage.
3. Energize fan motor briefly ("bump") and verify correct direction of rotation.
4. Energize fan motors and verify that motor FLA is within manufacturer's tolerance of nameplate FLA for each phase.

C. OPERATION AND MAINTENANCE

Submit four (4) copies of the Operation and Maintenance Manuals seven (7) calendar days prior to testing the air-handling units.

END OF SECTION 237416