

PROJECT MANUAL

Roof Replacement

Bolton High School Phase 2

7323 Brunswick Road
Arlington, Tennessee 38002

TFM No. 02447 & 02447-A
IFB – xxx

OWNER:

Memphis Shelby County Schools
1364 Farmville Road
Memphis, Tennessee 38122

Marc Calma
Phone: (901) 416-0183

TENANT:

Bolton High School
7323 Brunswick Road
Arlington, Tennessee 38002

Martavious Jones
Phone: (901) 416-1435

ARCHITECT:

braganza design/ GROUP
1861 Madison Avenue
Memphis, Tennessee 38104

Wendy Gross
Phone: (901) 458-7600

ROOF CONSULTANT:

Nashville Roof Consultants
P.O. Box 160527
Nashville, Tennessee 37216

James Oldham
Phone: (615) 238-5737

BIDDING DOCUMENTS

May 30, 2024

SECTION 00 01 07

DESIGNER'S STAMP AND SIGNATURE

ARCHITECT:

braganza design/ GROUP
1861 Madison Avenue
Memphis, Tennessee 38104
Phone: (901) 458.7600



SECTION 00 01 10

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LIST OF DRAWINGS

The Contract Drawings dated May 30, 2024, on which the proposals and Contract are to be based and which are to be supplemental by additional shop drawings and dimensional drawings of material and equipment and other drawings where specified, are as follows:

ARCHITECTURAL

A0.0	COVER SHEET
A0.1	ABBREVIATIONS, LEGENDS, NOTES & MAPS
A2.0	CAMPUS ROOF PLAN
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END OF SECTION

SECTION 00 10 00

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 PROJECT DESIGN DOCUMENTS

- A. Bidders (General Contractors) may view and obtain the Project Design Documents from **braganza design/ GROUP** plan room at www.Midsouthplanroom.com. Search Bolton High School – Roof Replacement Phase 2 under Public Jobs list.
- B. Bidders securing Bid Packages become Bidders of Record and are issued subsequent addenda.
- C. Bidders of Record may obtain additional copies of Bidding Documents from Designer at cost (nonrefundable). Reference *Section 00 11 00 SUPPLEMENTARTARY INSTRUCTIONS TO BIDDERS, PART 1 – DEFINITIONS, 1.1 COPIES, A.*
- D. The scope of the project includes Bolton High School – Roof Replacement Phase 2: A tear-off of all existing roofing layers down to the existing deck and the replacement of the Roofing System to include but not limited to insulation, coping, terminations, drains, gutters, downspouts, expansion joints, roof hatches, access ladders, etc. Roofs consist of Single-Ply and Metal systems, including some walls. Adjustments and minor work will also be completed on existing rooftop equipment including but not limited to curbs, piping, conduit, ducts, drains, etc.

1.2 EXAMINATION

- A. Bidders shall carefully examine site and documents to obtain first-hand knowledge of existing conditions and Work proposed.
- B. Contractor will not be given extra payment for conditions which can be determined by examining site and documents.

1.3 QUESTIONS

- A. Bidders shall submit questions about bidding documents to Procurement Services in writing, via emailed to: johnsongs@scsk12.org
- B. Subject line of email shall read “Questions –Bolton High School – Roof Replacement Phase 2. Questions must specifically reference the section of the Bid to which the question pertains.
- C. Questions must be received by the time and date indicated in the Invitation for Bidders (IFB).
- D. In order to prevent an unfair advantage, answers to question will be posted to www.scsk12.org/procurement/bids by addenda. All existing addendum shall become part of the Contract Documents.

1.4 LICENSING AND QUALIFICATIONS

- A. Bidders shall be familiar with the Contractors Licensing Act of 1976, as currently

amended (codified in Tennessee Code Annotated Sections 62-6-101, et seq.). A contract will not be awarded to a bidder whose bid is in conflict with State licensing law.

1.5 BID PRICING FORM

- A. Submit one Bid Proposal Form provided in publicly posted IFB. Failure to completely fill out Bid Form shall cause bid to be rejected.
- B. If a Bidder chooses not to bid an Alternate, Unit Price, or Base Bid in a multiple Base Bid project, write "No Bid" in the space. To indicate availability of an Add Alternate at no additional charge, write "No Charge" in the space. Additional stipulations or qualifications on Bid Form shall cause bid to be rejected.
- C. Bid proposal shall be signed by person or persons legally authorized to bind Bidder to contract.

1.6 BID SECURITY

- A. Bid Security is required in the amount of five percent (5%) of total amount of bid, including contingencies, allowances, and any alternates (if applicable) in the form of a Bid Bond or check (certified or cashier's) made payable to the MEMPHSI SHELBY COUNTY SCHOOLS BOARD OF EDUCATION.
- B. Bid Bonds shall be issued by Surety company licensed to do business in Tennessee by Tennessee Department of Commerce and Insurance.
- C. Bid Bonds shall be signed and certified by current Power-of-Attorney for Attorney-in-Fact attached.
- D. Owner may retain Bid Security of bidders to whom award is being considered until either (a) Contract has been executed, or (b) specified time has elapsed so that bid is not binding, or (c) bid has been rejected. If Bidder refuses to enter into Contract or fails to furnish all required attachments properly executed, the amount of Bid Security shall be forfeited to Owner as liquidated damages, not as penalty.

1.7 BID SUBMITTAL

- A. Submit Bid Proposal, with required attachments, enclosed and sealed in Bid Envelope with **Bid Identification Submittal Form** in the Bid Documents attached to the outside of the envelope. Bidder shall fill in blank spaces on face of Envelope or Envelope Form.
- B. If any work, regardless of dollar value, is required for Plumbing, HVAC, Electrical, Masonry, or Geothermal list subcontractor that will perform that work. If Bidder will perform that work with Bidder's own forces, fill in Bidder's name as subcontractor. If no work is required in a category, write "N/R" (None Required) or "N/A" (Not Applicable) in space provided for subcontractor(s).
- C. Provide State contractor license number, expiration date, and applicable classifications for Bidder and listed subcontractors, as applicable by State licensing law.
- D. Bidders are solely responsible for ensuring that bids are received by the time and at the place identified for receipt of bids. The bid opening time shall be established by the timepiece of the Owner's representative. Bids received late will be returned unopened.

- E. A bid sent by mail shall be enclosed in an envelope clearly marked "Bid Envelope Enclosed".

1.8 MODIFICATION AND WITHDRAWAL PRIOR TO CLOSE OF BIDDING

- A. Modification: Bids, once submitted, may be modified before the scheduled opening time only upon receipt of a written modification signed by an authorized representative of the Bidder. Modification to a bid may be made as an "Add" or "Deduct" only. Modification to bid may be written on the Bid Envelope with the signature of an authorized representative of the Bidder also written on the Bid Envelope. Modification shall indicate only the amount of change, clearly identified as an "Add" or "Deduct", and not indicate either the prior or resulting bid amount.
- B. Withdrawal: Bids, once submitted, may be withdrawn before the scheduled opening time only upon receipt of a written withdrawal request signed by an authorized representative of the Bidder.

1.9 POST-BID WITHDRAWAL OF BID FROM CONSIDERATION DUE TO MISTAKE

- A. Request to withdraw bid due to mistake must be in writing to Procurement Director, delivered in person or postmarked certified or registered mail not later than twenty-four hours after the time fixed for receipt and opening of bids. Request shall acknowledge that bidder refuses to enter into contract based on bid and intends to submit original work papers, documents, and materials used in preparation of the bid in like manner within five working days following date of bid opening.
- B. Bidder making such request will be removed from consideration for award of contract; and, a determination shall be made by a duly appointed review panel or the State Architect as to whether forfeiture of Bid Security may be waived.

1.10 CONSIDERATION OF BIDS

- A. To be considered, bids shall be made in accordance with these Instructions to Bidders and the Invitation for Bid. Failure to comply with these requirements shall cause bid to be rejected.
- B. The Owner reserves right to: reject prices proposed in a bid without invalidating other portions of bid; reject a bid which does not provide all required prices or attachments; waive informalities; and, reject any or all bids.
- C. It is Owner's intent to award contract, or multiple contracts in the case of multiple base bids, based upon lowest evaluated responsive bid submitted by responsible Bidder for Base Bid plus Alternates (if any) taken in order up to, but not to exceed the Bid Target. If the Base Bid of all bidders exceeds the established Bid Target, the low Bidder is determined by the lowest Base Bid submitted by a responsible Bidder irrespective of any Alternates (if any) bid. Alternates may be accepted or rejected at Owner's discretion, provided that final combination of Base Bid and accepted Alternates does not change low Bidder as established by above method.
- D. In the event of tie bids, preference will be given to local bidder over non-local bidder.
- E. In the case of a multiple Base Bid, Owner may award a combined contract for the Work of more than one Base Bid if the same Bidder is the successful low Bidder on each (project).

1.11 POST-BID INFORMATION

Each Bidder shall be prepared, if requested by Owner or Designer, to present, evidence of experience, qualifications, and financial ability to carry out the terms of the contract.

1.12 PERFORMANCE AND LABOR BOND

- A. The successful Bidder shall be required to submit a performance and labor bond, Cashier's or Certified Check in the amount of one hundred percent (100%) of the total amount of bid, of all phases of the contract, including contingencies, allowances, and any alternates (if applicable) to ensure the satisfactory completion of the work for which a contract or purchase order is awarded
- B. The bond, cashier or certified check must be made in favor of the MEMPHIS SHELBY COUNTY SCHOOLS BOARD OF EDUCATION, MEMPHIS, TENNESSEE 38112.

1.13 EXECUTION OF THE CONTRACT

- A. If a Bidder is presented the written Agreement form for signing, then that Bidder shall deliver to the Owner, within a stipulated time frame, the signed Agreement Form, Performance Bond, Payment Bond, and certificates of insurance.
- B. Failure of the Bidder to return the Agreement as within the stipulated time frame, shall entitle the Owner to require forfeiture of Bid Security and to proceed with award to the next lowest responsive Bidder.

1.14 AWARD OF THE CONTRACT

Presentation of Agreement form by Owner to Bidder for signature does not constitute award of Contract. Contract shall not be considered awarded until Bidder has received a fully executed Agreement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 10 00

SECTION 00 11 00

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

MODIFICATIONS TO VARIOUS ARTICLES IN THE INSTRUCTIONS TO BIDDERS, AIA DOCUMENT A701: The following supplements modify, change, and delete from or add to the “Instructions to Bidders,” **AIA Document A701, 2007**. Where any Article, Paragraph, Subparagraph, or Clause of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, and the unaltered provisions of that portion remain in effect.

PART 1 - DEFINITIONS

1.1 COPIES

- A. **Only the General Contractors will be allowed to purchase Drawings and Specifications from the Architect ONLY. Subcontractors will obtain Drawings and Specifications from the General Contractor ONLY. The General Contractor MUST USE and COMPLETE the MSCS Bid Identification Submittal Form located in the Invitation for Bid. This is to be completed should the General Contractor obtain bids from Subcontractors.**
- B. **General Contractor’s MUST PAY ALL REQUIRED COSTS to obtain MSCS Approved I.D. Badges from appropriate MSCS department issuing MSCS Temporary Vendor I.D. Badges. General Contractor’s personnel, subcontractors, vendors, representatives, etc. And all other persons visiting this project site on-behalf of the General Contractor must have completed all background checks per the approval of all appropriate MSCS personnel and have obtained in- person the approved MSCS Vendor I.D. Badge prior to substantial completion of this project for those persons that will be in contact with students. All persons on-behalf of the General Contractor must not enter this project site or other portions of this MSCS property without the MSCS Approved Temporary Vendor I.D. Badges being legible, clearly visible and appropriately displayed for any/and all other person(s) to recognize.**

PART 2 - BIDDING PROCEDURES

2.1 BID SECURITY

Reference Information for Bids for this section

2.2 SUBMIT BIDS TO

Submit Bids to:
Memphis-Shelby County Schools Board of Education
Department of Procurement Services
160 S. Hollywood Street, Room 126
Memphis, Tennessee 38112

END OF SECTION 00 11 00

SECTION 00 20 00

ADVERTISEMENT

Name of Project: **BOLTON HIGH SCHOOL – ROOF REPLACEMENT PHASE 2**

Location of Project: 7323 Brunswick Road
 Arlington, TN 38002

Designer: braganza design/ GROUP
 1861 Madison Avenue,
 Memphis, TN 38104

Phone: (901) 458-7600

Contact: Ms. Wendy Gross, AIA

Plan Rooms: Mid-South Plan Room: www.midsouthplanroom.com

 Memphis Reprographics: www.MRPlanroom.com

END OF SECTION

SECTION 00 30 00

BID PROPOSAL FORM

**TO: Memphis-Shelby County Schools Board of Education
Department of Procurement Services
160 S. Hollywood Street, Room 126
Memphis, TN 38112**

FROM:

Bidder Name: _____

Bidder's Address: _____

FOR: Bolton High School - Roof Replacement Phase 2

The Bidder hereby acknowledges, attests, certifies, warrants, and assures that:

1. Bidder has received, read and understands the Bidding Documents and this bid is made in accordance therewith.
2. Bidder has visited the site and become familiar with the local conditions under which the work is to be performed, and has correlated all observations with the requirements of the Bidding Documents.
3. Documents identified as "Information Available to Bidders" are prepared solely for the Designer's use in design of this Work and have not been relied upon in the preparation of this bid. The use and interpretation of such information for any purpose is entirely the responsibility of the using party.
4. Contractors and Subcontractors that have been disqualified from participating in State Building Commission projects have not been included in this bid and will not be allowed to perform work under the contract that may result.
5. Bidder shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor or consultant who will utilize the services of an illegal immigrant in the performance of this Contract.
6. Failure to complete this Bid Form, provide required attachments, or comply otherwise with instructions to Bidders, may be cause for rejection of bid.
7. The person who signs this bid on behalf of the Bidder is legally empowered to bind the Bidder to a Contract.
8. Iran Divestment Act. The Contractor certifies, under penalty of perjury, that to the best of its knowledge and belief the Contractor is not on the list created pursuant to Tenn. Code Ann. § 12-12-106. The Contractor further certifies that it shall not utilize any subcontractor that is on the list created pursuant to Tenn. Code Ann. § 12-12-106.\
9. This Bidder's status, as required by the State Building Commission Policy and Procedures, is:(True or False) _____The Bidder and/or any of the Bidder's employees, agents, independent contractors and/or proposed Subcontractors have been convicted of, pled guilty to, or pled nolo contendere to any contract crime involving a public contract. (Yes or No) _____The Bidder is a Women Owned or Minority Owned, Business Enterprise.
10. Bidder acknowledges receipt of the following addenda and the Supplemental Instructions to Bidders:
Addendum No. _____ dated _____ Addendum No. _____ dated _____
Addendum No. _____ dated _____ Addendum No. _____ dated _____
Addendum No. _____ dated _____ Addendum No. _____ dated _____
11. Bidder understands and agrees that the lump sum bid price includes all taxes such as sales, use, excise, licenses, etc., now or hereafter imposed by Federal, State or other government

agencies upon the equipment, labor and materials specified, and that all said taxes shall be paid by the Contractor.

12. This Bidder agrees to:

- a. Honor this bid for a period of sixty (60) days following the date of the scheduled opening of bids.
- b. Enter into and execute a contract, if presented on the basis of this bid, and to furnish certificate(s) of insurance, bond(s), and other documents related to the contract as required by the Bidding Documents.
- c. Accomplish the Work in accordance with the Contract Documents.
- d. Achieve Substantial Completion of the Work in accordance with the number of calendar days Contract Time set forth, allotted from and including the date stipulated in the Notice to Proceed; and, accept the conditions for Liquidated Damages in the amount set forth per calendar day.
- e. Obtain MSCS approved temporary vendor i.d. badges, if awarded a contract, for the Bidder's (General Contractor's) personnel and subcontractors, and pay all applicable cost associated with obtaining temporary vendor i.d. badges.
- f. The required Owner's Contingency, in the amount of ten percent (10%) of the BASE BID, is identified herein below and is refundable if it isn't utilized.
- g. The required Bid Security (Bond), in the amount of five percent (5%) of the total amount of bid, including alternates and allowances is attached hereto.
- h. The Promise of Non-Discrimination Statement, is attached hereto.

Base Bid: (Words) _____

Base Bid: (Figures) \$ _____

10% Owner's Refundable Contingency Allowance in addition to the Base Bid (Figures) \$ _____

Performance and Payment Bond Cost (Figures) \$ _____

Total Combined Base Bid (Figures) \$ _____

(Base Bid + 10% Owner's Contingency Allowance + Performance and Payment Bond Cost)

Alternates (01 23 00) to be used to modify the base contract amount (items not included in base bid)

Alternate No. 1 – "Old Gym Windows" \$ _____

Alternate No. 2 – "Aluminum Roof Ladder" \$ _____

Unit Costs (01 22 00) to be used to modify the base contract amount (items not included in base bid)

1. Deteriorated (Tectum) Cementitious Wood Fiber Decking – 3" panel \$ _____ per 15 sf
2. Deteriorated LWC Decking \$ _____ per 5 sf
3. Deteriorated Masonry Tuck Pointing \$ _____ per 100 lf
4. Deteriorated Metal Decking – 1-1/2" Type A \$ _____ per 10 sf
5. Deteriorated Metal Decking – 1-1/2" Type B \$ _____ per 10 sf

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|--|----------|-----------|
| 6. Deteriorated Metal Decking – 1-1/2” Type F | \$ _____ | per 10 sf |
| 7. Deteriorated Metal Decking – 1-1/2” Type Acoustic w/ Insulated Flute Fill | \$ _____ | per 10 sf |
| 8. Deteriorated Wood Blocking – 2x4 | \$ _____ | per 1 lf |
| 9. Deteriorated Wood Blocking – 2x6 | \$ _____ | per 1 lf |
| 10. Deteriorated Wood Blocking – 2x8 | \$ _____ | per 1 lf |
| 11. Deteriorated Wood Blocking – 2x10 | \$ _____ | per 1 lf |
| 12. Deteriorated Wood Decking – 1x4 | \$ _____ | per 1 lf |
| 13. Deteriorated Wood Decking – 1x6 | \$ _____ | per 1 lf |
| 14. Deteriorated Wood Decking – 1x8 | \$ _____ | per 1 lf |
| 15. Deteriorated Fire-Treated CDX Plywood Decking / Sheathing – 1/2” | \$ _____ | per 10 sf |
| 16. Deteriorated Fire-Treated CDX Plywood Decking / Sheathing – 3/4” | \$ _____ | per 10 sf |
| 17. Masonry Through-Wall Flashing | \$ _____ | per 20 lf |

THIS BID IS SUBMITTED BY:

Authorized Signature: _____ Date: _____

Print Name and Title: _____

ON BEHALF OF:

Bidder Name (Prime Contractor): _____

State of Incorporation: _____

License Number: _____

Bidder's Address: _____

Bidder's Phone: _____

Bidder's Fax: _____

Bidder's Email: _____

NOTE: TENNESSEE CONTRACTOR'S LICENSE NUMBER, EXPIRATION DATE, AND LICENSE CLASSIFICATION IS REQUIRED ON THE OUTSIDE OF THE BID ENVELOPE. ALL CONTRACTOR'S MUST USE THE BID ENVELOPES OR BID ENVELOPE FORM PROVIDED IN THE PROJECT DESIGN PACKET OR INVITATION TO BID DOCUMENTS

END OF SECTION

SECTION 00 80 00

SUPPLEMENTARY CONDITIONS

MODIFICATIONS TO VARIOUS ARTICLES OF THE GENERAL CONDITIONS

The following supplements modify, change, and delete from or add to the "General Conditions". Where any Article, Paragraph, Subparagraph, or Clause of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article remain in effect.

PART 1 - GENERAL PROVISIONS

1.1 THE WORK

If there is any conflict within or between any of the Contract Documents involving the quality or quantity of work required, it is the intention of the Contract that the work of highest quality or greater quantity shown or specified shall be furnished. Whether or not the word "all" is used in the specification, coverage is intended to be complete, except where partial coverage is specifically and expressly noted. In all cases where an item is referred to in the singular number, it is intended that the reference shall apply to as many such items as are required to complete the work.

PART 2 - OWNER

2.1 LIQUIDATED DAMAGES

A. Liquidated Damages (**if Substantial Completion date is missed**): The Owner in cases of delay has the right to assess Liquidated Damages against the Contractor. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER as follows for each day that expires after the time specified for Substantial Completion until the Work is substantially complete.

TOTAL PER DAY **\$ 600.00/day**

Item	Daily Cost
Building Engineers Overtime Rates Time and One-half Rate:	\$175.00/hr.

B. Liquidated Damages (if Final Completion date is missed): The Owner in cases of delay has the right to assess Liquidated Damages (LD) against the Contractor. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as LD for delay (but not as a penalty), CONTRACTOR shall pay OWNER as follows for each day that the project extends past the Final Completion Date established in the Detailed Construction Sequence.

TOTAL PER DAY **\$ 800.00/day**

Item	Daily Cost
Building Engineers Overtime Rates Time and One-half Rate:	\$175.00/hr.

- 2.2 The Contractor will be responsible to obtain all necessary Drawings and Project Manuals necessary for execution of the Work at Contractor's expense.

PART 3 - CONTRACTOR

- 3.1 The Owner may post an IFB project and award it with a planned delayed start of construction. This planned delay period shall be used by the Contractor for submitting shop drawings and ordering materials. If so, the following will be factors to consider:

- A. Storage of materials ordered early: The Contractor shall use a bonded warehouse within the Memphis City Limits. Material must be protected, identified as property of Memphis Shelby County Schools, and segregated from other materials. The Contractor may invoice for materials received and stored once MSCS has approved warehouse storage location.
- B. The Architect or Manager of MSCS Division of Design & Construction shall visit the warehouse as part of verifying each pay request. The Architect or Manager of MSCS Division of Design & Construction shall visit the warehouse and receive a copy of the bonding instrument, The Architect or Manager of Memphis Shelby County Schools Design & Construction shall accept or reject the warehouse, without assuming any responsibility for materials actually stored there later.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

By the representation made under Part 2 of AIA Document A701, extra payments will not be authorized for work that, in the opinion of the Owner, could have been determined by careful examination of the site.

3.3 LABOR AND MATERIALS

The Contractor shall disclose the existence and extent of financial interest, whether direct or indirect, they have in subcontractors and material suppliers which he may propose for the project.

3.4 PERMITS, FEES, AND NOTICES

Contractor shall also secure and pay for permits associated with installation of Owner supplied. Owner installed materials.

PART 4 - CHANGES IN THE WORK

4.1 CHANGE DIRECTIVES

- A. The form of change directive shall be AIA FORM G 701.
- B. The Contractor shall submit to the Architect final Change Directives, Construction Change Directive, or order for a minor change to the work no later than 45 days after the date of Substantial Completion as established in Subparagraph 6.2. A.1. The Owner reserves the right to deny any such item submitted after that period of time.

4.2 CONSTRUCTION CHANGE ORDER DIRECTIVES

- A. The allowance for overhead and profit included in the total cost to the Owner shall be based on the following:
 - 1. For the Contractor or Subcontractor performing work with their own forces, the

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allowance shall be 10% overhead and 5 % profit.

2. For the Contractor, for work performed by the Contractor's Subcontractor, the allowance shall be 5% profit of the amount due the Subcontractor.
3. Cost to which overhead and profit is to be applied shall be determined in accordance with the General Conditions.
4. In order to facilitate checking of quotations for extras or credit, all proposals shall be accompanied by a complete itemization of costs of all Work including labor, materials, and. equipment, plus the allowance for overhead and profit.

PART 5 - TIME

5.1 DATE OF ISSUANCE OF SUBSTANTIAL COMPLETION

The Date of Issuance of Substantial Completion is the date the Owner signs the Certificate of Substantial Completion in accordance with Paragraph 6.3. The wording on the AIA Document G704 shall be changed to reflect this definition.

PART 6 - PAYMENTS AND COMPLETION

6.1 SCHEDULE OF VALUES

The Schedule of Values shall be prepared on AIA forms G 702 and G 703.

6.2 APPLICATIONS FOR PAYMENT

A. Attachments to the First Pay Application:

1. MWBE Report from Contractor / Architect (If Applicable)
2. Construction Photos
3. Monthly Progress Report
4. Schedule Update
5. Prevailing Wage Certification
6. Project Record Documents Certification
7. Certificate of Insurance if any stored items in MSCS name.
8. **Application(s) for Payment shall also be Based Upon the QUALITY OF WORK AT THE TIME OF EACH PAYMENT APPLICATION AS QUALITY OF WORK IS DEEMED IN WHOLE OR IN-PART ACCEPTABLE BY THE MSCS MAJOR CONSTRUCTION MANAGER FOR CONSTRUCTION AS RELATED TO EACH RESPECTIVE WORK ITEM.**

- a. Attach a copy of the Letter of Intent required.
- b. Attach a copy of the Notice of Intent required.

B. Attachments to the monthly Pay Applications: Beginning with the second Application for. Payment, the Contractor shall attach the following:

1. MWBE Report from Contractor / Architect (If Applicable)
2. Construction Photos
3. Monthly Progress Report
4. Schedule Update
5. Prevailing Wage Certification
6. Project Record Documents Certification
7. Certificate of Insurance if any stored items in MSCS name.
8. **Application(s) for Payment shall also be Based Upon the QUALITY OF WORK AT THE TIME OF EACH PAYMENT APPLICATION AS QUALITY OF WORK IS DEEMED IN WHOLE OR IN-PART ACCEPTABLE BY THE MSCS MANAGER OF DESIGN AND CONSTRUCTION AS RELATED TO EACH RESPECTIVE WORK ITEM.**

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- a. Certification that the subcontractors and major material suppliers have been paid the amounts drawn on the previous estimate for the respective items.
 - b. The current monthly Tennessee Construction Storm Water Inspection Report required by that permit.
 - c. Review of "Project Documents – Job Set," signed by Contractor and Owner.
- C. Attachments to the monthly Pay Applications on a quarterly basis: (If Applicable)
1. Attach the quarterly inspection reports to TDEC which the Contractor has sent to TDEC for their review. Attach to the appropriate month's Pay Application. (Note: Quarters end on 3/31, 6/30, 9/30, and 12/31. TDEC allows until the 15th of the following month to receive the inspection reports.).
 2. The current monthly Tennessee Construction Storm Water Inspection Report required by that permit.
- D. Attachments to the final Pay Application:
1. Attach the TDEC approved Notice of Termination
 2. Architect's Asbestos Free School Certification (New Construction Only).
 3. Architect's Lead Free School Certification.
 4. Contractor's Asbestos Free School Certification (New Construction Only).
 5. Contractor's Lead Free School Certification.
- E. Until final payment, the Owner will pay 90% of the amount due the Contractor on account of progress payments.

6.3 SUBSTANTIAL COMPLETION

- A. Substantial Completion is the point in the progress of the Work when the Owner agrees that the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the work for its intended use.
- B. Prior to the Owner issuing a Certificate of Substantial Completion, the entire Punchlist must be signed off by Contractor, Owner or Memphis Shelby County Schools Manager of Design and Construction.
- C. 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. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does to alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Architect, Owner, and Owner's maintenance staff shall conduct an inspection to determine whether the Work or designated portion thereof is substantially complete. If the inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before submittal of the Certificate of Substantial Completion by the Architect, complete or correct such item upon notification by the Owner. The Contractor shall then submit a request for another inspection by the Architect, the Owner and the Owner's maintenance staff to determine a preliminary Substantial Completion. When the work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion, together with a list of incomplete items, and submit it to the Contractor. When the Contractor signs and dates it, the Architect shall submit the Certificate of Substantial Completion, and a list of incomplete items to the Owner. When the Owner signs the Certificate of Substantial Completion that date shall

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establish the Date of Issuance of Substantial Completion, shall establish responsibilities, of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate of Substantial Completion. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. By signing the Certificate of Substantial Completion the Owner and Contractor each accepts the responsibilities assigned to them in such certificate.

- D. Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment for such Work or portion thereof as provided in the Contract Documents.

PART 7 - PROTECTION OF PERSONS AND PROPERTY

7.1 SAFETY OF PERSONS AND PROPERTY

- A. Contractor shall lock all fence gates and building doors at the end of each work day. Should the Owner discover open gates or doors after the contractor's superintendent has left, the Owner or Manager of Design & Construction shall arrange for security people to come to the site immediately and remain there until the start of the next work day. The Owner shall deduct the cost of those security people from the next pay application which the Contractor submits.

PART 8 - INSURANCE AND BONDS

8.1 CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall purchase and maintain during the life of the Contract, such insurance as will protect himself and the Board of Education from claims for damage, for bodily injury (including accidental death), personal injury, as well as from claims for property damages, which may arise from operations under this Contract, whether such operations be performed by the Contractor or by the subcontractors or by anyone employed by either of them directly or indirectly or by anyone, for whose acts any of them may be liable. Such coverage shall be \$1,000,000 limits for bodily injuries, \$500,000 for property damage, and \$1,000,000 bodily injury (\$50,000 property damage) for motor vehicle liability. Any work connected with construction which is excluded from the contractor's or subcontractor's public liability insurance and property damage insurance shall be covered by rider or riders to such policies, and such coverage shall be made prior to doing any work under special hazards in the same amount as above.

8.2 EXCESS UMBRELLA LIABILITY:

The Contractor shall purchase and maintain during the life of the Contract excess umbrella liability of \$1,000,000 each occurrence.

8.3 WORKMEN'S' COMPENSATION INSURANCE:

The Contractor shall purchase and maintain during the life of the Contract Workmen's Compensation Insurance for all employees employed at the site at the project in accordance with the laws of the State of Tennessee.

8.4 PROPERTY INSURANCE

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- A. The owner will not purchase property insurance. The Contractor shall purchase and maintain All-Risk Builder's Risk, Completed Value Fire and Extended Coverage insurance in an amount sufficient to protect all parties to the Contract for the full insurable value of the entire work.
- B. The insurance shall cover storm, wind, fire, vandalism, theft and malicious mischief. The policy shall be written on a replacement cost basis. The policy shall name the Owner, contractor, all unnamed subcontractors and Owner as additional insured. The loss, if any, is to be made adjustable and payable to the Owner, Contractor, Subcontractor and any affiliated or associated companies. The deductible shall be the responsibility of the Contractor. Furnish insurance in a sufficient amount to cover value of work installed, and the building materials, supplies, and the construction equipment at the project site against theft.

8.5 PROOF OF INSURANCE:

The contractor shall, before construction commences, furnish the Owner with satisfactory evidence of coverage of such insurance as noted above. Any insurance company to be acceptable must have an agent domiciled in the city of Memphis, Tennessee.

8.6 PERFORMANCE BOND AND PAYMENT BOND

- A. The Contractor shall furnish bonds for the full amount of the Contract price, covering faithful performance of the Contract and payment of all obligations arising thereafter. The premium shall be paid by the Contractor.
- B. The bonds shall be written by a Surety Company licensed to transact business in the State of Tennessee with the agent domiciled in the Memphis, Tennessee, geographical area.
- C. The bonds shall be attached to the four signed original copies of the Contract which the Contractor shall return to the Owner. Bonds shall be AIA Document A-311.

END OF SECTION 00 80 00

SECTION 00 83 50

TOBACCO USE OR POSSESSION AND DRUG FREE WORKPLACE POLICIES

PART 1 GENERAL

1.1 TOBACCO USE OR POSSESSION POLICY

- A. PURPOSE: To provide a safe and healthy environment for all employees, students, and visitors and to serve as a positive example to all students concerning the use of tobacco.
- B. SCOPE: This policy applies to all employees, students, and visitors.
- C. POLICY STATEMENT: The Memphis Shelby County Schools system prohibits student smoking or possession of tobacco products, lighters or matches, on school campuses, at school sponsored activities or on school buses. Additionally, smoking and/or the use of all tobacco products, including smokeless tobacco, are prohibited in all Board of Education buildings (schools and other facilities); in any public seating areas, including but not limited to, bleachers used for sporting events, or public restrooms; and in all vehicles, owned, leased or operated by the district at all times. Signs will be posted throughout the District's facilities to notify students, employees and all other persons visiting the school that the use of tobacco and tobacco products is forbidden. A "Smoking is Prohibited by Law in Seating Areas and in Restrooms" sign shall be prominently posted for elementary or secondary school sporting events (including at each ticket booth). Any student who possesses tobacco products shall be issued a citation by the school principal. Parents and students shall be notified of this citation requirement at the beginning of each school year.
- D. RESPONSIBILITY: The Superintendent (or designee) is responsible for administering this policy.

1.2 DRUG FREE WORKPLACE POLICY

- A. PURPOSE: It is the policy of the Memphis Shelby County Schools to maintain a drug-free and safe work environment.
- B. SCOPE: The unlawful manufacture, distribution, dispensing, possession, purchase, sale, transfer, or use of drugs or alcohol when on the job or in the workplace are strictly prohibited.
- C. POLICY STATEMENT: Employees (and contractors) should not be under the influence of drugs (as defined below) or alcohol during their working hours for Memphis Shelby County Schools regardless of whether those drugs or alcohol were consumed during working hours or prior thereto.

Drugs are defined for the purpose of this policy as: (a) drugs which are not legally obtainable, and (b) drugs which are legally obtainable, but have not been prescribed by a licensed physician for the person that is in possession of the drug.

When management has reasonable suspicion to believe that an employee (or contractor) is using or is under the influence of drugs or alcohol while at work, management may request that the employee (or contractor) participate in a drug and/or alcohol screening procedure to determine if the employee (or contractor) has evidence of alcohol or drugs in his or her blood or urine. The supervisor or managerial person

shall relate to the employee the reason the test is being requested. A refusal to submit to the above procedure will be considered insubordination which is a major infraction and subject to major discipline, up to and including possible termination. If the employee (or contractor) does submit to the said screening

procedure and it is determined that there is evidence of drugs or alcohol present, disciplinary action up to and including termination may result.

All persons in jobs within the system requiring commercial driver's licenses will be subject to drug and alcohol testing as mandated by federal law and the Tennessee Code Annotated.

The violation of any provision of this policy is considered a major disciplinary infraction and may result in disciplinary action up to and including termination.

Under appropriate circumstances, management may require that the employee participate fully and satisfactorily in an approved drug or alcohol rehabilitation program coordinated by Employee Assistance Program (EAP) and such participation may be considered as part of the disciplinary process. The employee will be allowed to return to work only with a signed Return to Work Agreement.

- D. RESPONSIBILITY: As a condition of continued employment with Memphis Shelby County Schools, all employees (and contractors) must abide by Memphis Shelby County Schools System's policy on an alcohol and drug-free workplace.

PART 2 PRODUCTS – NOTUSED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 00 93 50

REQUESTS FOR INFORMATION

PART 1 - GENERAL

1.1 PRIOR TO THE BID DATE

All Requests for Information prior to the Bid Deadline Date must be submitted to Procurement Services in writing, via emailed to: Gwendolyn Johnson - johnsongs@scsk12.org. Reference Section 00 10 00 Instructions to Bidders, Part 1 – General, 1.3 Questions.

1.2 AFTER AWARD OF CONTRACT

- A. All Requests for Information after award of the Construction Contract shall be submitted to the Designer by the General Contractor. Each Request for Information Form shall be complete with data indicating the specific drawing(s) or specification(s) in need of clarification including the following:
1. RFI number (RFI's shall be numbered consecutively by the Contractor as submitted).
 2. Date submitted
 3. Subject requiring clarification
 4. Discipline (Architectural, etc.)
 5. Co-author, if applicable
 6. Detailed statement of the information requested
 7. Date information required
- B. Requests for Information shall be made in a timely manner allowing the Architect/Designer a reasonable amount of time to review the request. If the date a response is required is not indicated, the assumed date the response is required shall be 10 working days from the date the Architect received the request.
- C. Submittal of an RFI constitutes representation that the Contractor requires additional information about the Contract Documents after he/she has made careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior project correspondence or documentation.
- D. If, upon evaluation of the RFI, the Architect/Designer finds that the requested information is contained in the Contract Documents or by other documents and/or methods as outlined in Paragraph "D", the Owner has the option to obtain reimbursement from the Contractor for costs incurred by the Owner for Architect/Designer's services and expenses made necessary in answering such requests.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 10 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Drawings and general provisions of the Owner's Contract for Construction and other Division - 1 Specifications Sections, apply to this Section.

1.02 PROJECT DESCRIPTION

- A. Scope of Work Includes tear-off of all existing roofing layers down to the existing deck and the replacement of the Roofing System to include but not limited to insulation, coping, terminations, drains, gutters, downspouts, expansion joints, roof hatches, access ladders, etc. Roofs consist of Single-Ply and Metal systems, including some walls. Adjustments and minor work will also be completed on existing rooftop equipment including but not limited to curbs, piping, conduit, ducts, drains, supports, etc. Work will be performed at Bolton High School, 7323 Brunswick Road, Arlington, Tennessee 38002.
- B. Daily cleaning of the facility in the areas of construction will be required to the satisfaction of the Owner's Representative, as Classes will remain in session during the entire construction process.
- C. All construction employees must have identification badges from their employing contractor while on site and a sign-in roster will be required for control.
- D. Smoking is not permitted on Campus. It is a Smoke-Free Campus.
- E. Parking should be coordinated with the Physical Plant Department prior to Construction. They will identify a lot and assign temporary parking tags for that area only. Parking in spaces and lots identified as staff, faulty and gated areas is not allowed.

1.03 PROTECTION AND/OR REPLACEMENT CONTIGUOUS ITEMS

- A. All contiguous items and other items which are disturbed, broken, removed or otherwise damaged during the execution of this Contract shall be replaced with materials, methods and design of the original construction.

1.04 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the Premises to construction activities.
 - 1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed. Parking areas for Contractor and employees shall be pre-arranged with the Owner in advance of the Work beginning and the Contractor mobilizing onto the site. Parking on streets and in unauthorized areas by Contractor and employees is not permitted. Keep new and existing driveways and entrances indicated on drawings serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize conflicts with peak traffic hours and to minimize space and time needed for storage of materials and equipment.
- B. Avoid heavy construction activities, parking and staging within the canopies of existing trees and landscaping.

- C. Construction Staging, Storage and Entry locations are identified on the Drawings.

1.05 LOCATING AND PROTECTION OF EXISTING UTILITIES

- A. Unknown Utility Lines:
 - 1. In performing the work under the Contract, it is possible that unknown utility lines may be encountered. Such lines may be lines which have been, or will be, abandoned, inactive lines which may be desired to preserve for future use, or active lines which must be preserved and either relocated or replaced.
 - 2. Should such unknown lines be encountered, immediately notify the Designer in writing, who will examine the lines to determine whether they have been or will be abandoned or shall be preserved. The Contractor shall assist the Designer, by making tests or otherwise as the Designer deems necessary to determine how best to dispose of them.
 - 3. If the lines have been or may be abandoned, remove them to the extent necessary without additional cost to the Owner. If it is found desirable or necessary to preserve the lines, they shall be capped off, relocated or replaced, as directed by the Designer, by making tests or otherwise as the Designer deems necessary to determine how best to dispose of them.
 - 4. Should changes in connection with unknown utility lines which are to remain active involve a change in the quantity of work called for by the Drawings and Specifications, the Contract Amount shall be equitably adjusted, by a change order, in accordance with the provisions of the Owner's Contract for Construction for changes in the work.
- B. Make a personal inspection of all existing records showing locations of buried and underground utilities. Conduct a walking examination to physically verify locations of existing utilities and any conflicts with the proposed construction and the location of existing utilities.
 - 1. Prior to performing any excavation and/or trenching operations, call Tennessee One Call Buried Utility Location, 1-800-351-1111.

1.06 GRADES, LINES, LEVELS, AND SURVEYS

- A. All grades, lines, levels, and benchmarks for the building shall be established and maintained by the General Contractor who shall be responsible for same.
- B. Verify all grades, lines, levels, and dimensions as shown on the Drawings, and report any errors or inconsistencies discovered in the above to the Engineer before commencing work. Provide and maintain established benchmarks in not less than two widely separated places.

1.07 FIELD MEASUREMENTS

- A. The General Contractor shall take measurements in the field to verify or supplement dimensions indicated on Drawings and shall be responsible for accurate fit of specified work. Any discrepancy between the Drawings and the actual conditions shall be reported immediately to the Designer.
- B. Tolerances: The General Contractor shall be responsible to maintain dimensions for spaces requiring close tolerances for such items as equipment or fixtures by "grounding" such locations. Uneven surfaces and joints will not be accepted which prevent the installation of units whose dimensions are shown in the documents.

- C. The General Contractor shall appoint one of his personnel who is continually employed on the job site (such as the Superintendent) whose additional duty it will be to act as fire warden for the project. The fire warden shall institute and vigorously enforce a program of fire safety for the project.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION

3.01 WORK SEQUENCE

- A. The purpose of this project is the replacement of roofing systems, edge metal, copings, drainage systems and hatches. The Work will be conducted under one contract for construction. Contractor is to provide written notification to the Designer, and the Owner well in advance of any possibly conflicting construction activities.
- B. Contractor shall conform to all Fire Department Requirements related to maintaining an approved all-weather access road into the Construction Site. Contractor shall also provide fire flows required from proposed fire hydrant locations. All required materials will be confirmed with the fire department and submitted to the Designer and Owner prior to beginning work.
- C. The Campus will remain open and operational during the entire Construction process & all Classes will continue on their scheduled time. The Contractor should take notice of dates the school will be closed & hours the Campus is NOT in operations to schedule tasks that are LOUD in nature & Construction that may hinder traffic patterns & block Fire Exits. Campus will provide a school calendar and critical dates (exams) to aid in establishing a sequence of work.
- D. The General Contractor is required to submit a construction sequence and schedule for each of the individual buildings involved as well as each campus as a whole for approval to the Designer and Owner at the Pre-Construction meeting.
- E. Work Performed Under Separate Contracts:
 - 1. Work denoted as "By Others" will be furnished and installed by the Owner or by others under separate contracts. Contractor shall rough-in and make connections of mechanical and electrical services as required for work not in contract.
- F. Work by Others:
 - 1. Cooperate with other contractors or Owner's work crews for work on this Project in the arrangements for storage of materials and in the detailed work of these separate contractors and notify the Designer immediately of lack of progress or defective workmanship on their part where such delay or defective workmanship will interfere with Contractor's own operations. Contractor's failure to keep informed of the progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with Contractor's own work.
- G. Coordination of Work:
 - 1. The General Contractor and subcontractors, particularly mechanical and electrical, shall review other sections of work applicable to their own work. Each shall be held responsible for coordination and inclusion of the work indicated as if it were in the particular subcontractor's section. The Designer shall be advised in writing on any discrepancies or conflicts at the earliest moment.

2. All subcontractors, suppliers, etc. shall be responsible for knowing what information is given on all sheets of the Plans and Specifications concerning his particular work. If an item or piece of work is shown on the Designer and not the mechanical, electrical or structural drawings, it shall be included in the Contract. The reverse condition shall also apply.
- H. Use and Occupancy of Project Prior to Acceptance:
1. The Contractor agrees to the use and occupancy of a portion or unit or the Project before formal acceptance by the Owner under the following conditions:
 - a. A Certificate of Substantial Completion shall be prepared and executed. Upon receipt of the Certificate of Substantial Completion, the Contractor shall obtain a written endorsement of the Contractor's Insurance Carrier and Surety permitting occupancy by the Owner during the remaining period of project work.
 - b. Occupancy by Owner shall not be construed as being an acceptance of that part of the project to be occupied.
 - c. The Contractor shall not be held responsible for damage to the occupied part of the Project resulting from Owner's occupancy.
 - d. Occupancy by Owner shall not be deemed to constitute a waiver of existing claims in behalf of the Owner of Contractor against each other.
 - e. Use and occupancy by Owner prior to project acceptance does not relieve the Contractor of his responsibility to maintain all insurance and bonds required of Contractor until project is completed and accepted by Owner.

3.02 PROJECT SITE CLEAN-UP REQUIREMENTS

- A. One of the contracts obligations is to keep the adjacent parking areas, streets, and sidewalks clean of mud and debris.
- B. It shall be the duty of this Contractor to assume such contract obligations and provide whatever equipment necessary, including washing facilities, to keep the equipment from depositing materials on the public streets.
- C. Upon seven (7) days written notice, if the Contractor fails to correct or clean-up any deposits, the Owner may without prejudice to any other remedy, make good such contract deficiencies. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.
- D. Options of Work:
 1. If the Contractor is given an option of materials and methods used in the work and installation, the aim is to achieve the most economical installation that is acceptable for the work indicated by the option. In such cases it is the intention of the Drawings and Specifications that the option fully cover usual items for a completed job whether mentioned specifically or not.
- E. Fire Prevention:
 1. The Contractor shall meet with the Fire Marshall prior to beginning of construction and propose a plan for fire prevention and protection during the construction period, with particular emphasis on protecting the building during construction. The plan shall include, but will not be limited to, provisions for exits where necessary due to construction processes on existing exits, access for the Fire Department to the site and areas of the building, early awarding of contracts for fire prevention equipment, proper supervision of open flames, and welding or cutting equipment, use of flame-proofed tarpaulins, hydrant protection availability, emergency protection in the form of extinguishers, water pails, sand and small hose streams. Combustibles shall be kept outside of new construction. An emergency procedure for fire alarm shall be established.

- F. Revision of Schedules:
1. The Architect shall revise and reissue upon request by the General Contractor those schedules in the Contract Documents that have been drastically changed by the Addenda. These will be issued to the General Contractor as soon as possible after contract award.
- G. Obstruction, Cutting and Repairing:
1. Any obstructions encountered during the construction or installation of the Contract work shall be overcome by the Contractor, by removal or alteration of work in place, or adjustments in the new work, without additional cost to the Owner. All cutting of work in place shall be performed in a neat and workmanlike manner and held to a minimum. All cutting of work in place shall be patched and restored to good condition acceptable to the Architect.
- H. Contract Forms and Bidding Requirements:
1. Forms, requirements and documents included under Division 0, Division 1 and General Requirements of this Project Manual are a part of the Contract Documents.
 2. Plan sheets, as identified in *Section 00 01 15 – List of Drawings* are a part of the Contract Documents.
 3. The requirements of Division 0 and Division 1 apply to all Division and Sections of this Project Manual as if reproduced therein.

3.03 COORDINATION

- A. LAYOUT: Each Contractor shall locate and layout the work and all its parts and establish lines and levels accurately.
1. The General Contractor and subcontractors shall review other sections of work applicable to their own work. Each shall be held responsible for coordination and inclusion of the work indicated as if it were in the particular subcontractor's section. The Architect shall be advised in writing on any discrepancies or conflicts at the earliest moment.
 2. All subcontractors, suppliers, etc. shall be responsible for knowing what information is given on all sheets of the Plans and Specifications concerning his particular work. If an item or piece of work is shown on the architectural and not the mechanical, electrical or structural drawings, it shall be included in the Contract. The reverse condition shall also apply.
- B. USE OF PREMISES: Confine apparatus, storage of materials and operations of workmen to limits indicated by law, ordinances, permits or directions of the Owner. Do not unreasonably encumber the premises and materials.
- C. Coordinate work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
1. Coordinate scheduling, submittals and work of the various sections to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items scheduled to be installed at a later time.
 2. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service, such equipment.
 3. Coordinate dimensioning and space requirements and installation of plumbing/mechanical and electrical work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts and conduits, as closely as practicable; make runs parallel with lines of building. Confirm alignments with Owner

and Designer. Utilize spaces efficiently to maximize accessibility for other installations.

4. Project to be Bid as a single Scope of Work.
- D. Verify that utility requirements of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in such service equipment.
- E. Coordinate space requirements and installation of mechanical and electrical. Follow routing where shown for pipes, ducts and conduit. Utilize space efficiently to max. accessibility for other installations, maintenance and repairs.
- F. In finished areas conceal pipes, ducts & wiring within the construction. Coordinate locations of fixtures & outlets with finish elements. Coordinate completion & clean-up of work of various sections in preparation for substantial completion.
- G. Examine the substrate & the conditions under which the work of each section is to be performed. Do not proceed with work under that section until unsatisfactory conditions have been corrected.
- H. Determine temperature and humidity requirements for installation areas. Do not install work until required temperature and relative humidity have been stabilized and maintained in those areas.
- I. Coordinate building mechanical system operation requirements with delivery of items and installation requirements.

3.04 OWNER - FURNISHED ITEMS

- A. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule and will inspect deliveries for damage.
- B. If Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services and the delivery of manufacturer's warranties and bonds to the Contractor.
- C. The Contractor is responsible for designating the delivery dates of Owner-furnished items in the Contractor's Construction Schedule and for receiving, unloading and handling Owner-furnished items at the site. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements and to repair or replace items damaged as a result of his operations.

3.05 TRANSPORTATION, STORAGE AND PROTECTION

- A. Protect work during transit, delivery, storage & handling to prevent damage, soiling & deterioration.
- B. Do not deliver items until operations which could damage finished work have been completed in storage of installation areas. If items specified herein must be stored in area other than install area, store only in areas meeting requirements specified for install area. When specified items are stored off the job site, provide adequate insurance to protect tenant from loss.
- C. There may be limitations to the max. size object that can be moved from a loading area to the install area. Coordinate items to ensure delivery to the proper location.

- D. Maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance. Just prior to owner's acceptance remove protective covering, wipe clean, adjust & lubricate hardware, check proper operation of all items.

3.06 CLEANING

- A. Each Contractor, at all times, shall keep the premises free from accumulation of waste material or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the Project, as well as his tools, construction equipment, machinery and surplus materials.
- B. Execute final cleaning prior to final inspection. In addition, refer to & comply with the manufactures' specific recommendations concerning cleaning methods & materials. Clean interior/exterior glass & surfaces exposed to view; remove temporary labels, stains & foreign substances, polish transparent & glossy surfaces, vacuum carpeted & soft surfaces. Clean permanent type filters & replace renewable media type filters of operation equipment. Remove waste & surplus materials, rubbish & construction facilities from the site.
- C. Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 – GENERAL

1.01 GENERAL DOCUMENTS

- A. The GENERAL DOCUMENTS from a part of this Section.

1.02 DESCRIPTION

- A. Each Bidder shall insert unit prices in the appropriate blanks in the Bid Form.
- B. The Contractor, when submitting unit prices shall be deemed to have represented by the submittal that such unit prices include all items of cost, overhead and profit for this Contractor and any subcontractor(s) involved, and that they shall be used uniformly without modification for either additions or deductions.
- C. Unit Prices listed herein are subject to mutual agreement and when approved become a part of the Contract and will be added to or deducted from the Contract by Change Order.
- D. Unit Prices are not to be considered a part of the Base Bid amount.
- E. Unit Prices to be based on quantities as listed below.

1.03 DEFINITIONS for each Unit Price item are as follows:

Item	Related Sections	Unit	Unit Price Minimum
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1. 03 51 13 s.f. 15 s.f.
Deteriorated (Tectum) Cementitious Wood Fiber Decking replacement – (3” thick panel assumed) to remove, replace, and secure. This is to match existing materials.
2. 03 52 00 s.f. 5 s.f.
Deteriorated LWC Deck replacement – to remove, replace, and secure. This is to match existing materials.
3. 04 20 00 l.f. 100 l.f.
Deteriorated Masonry Tuck Pointing replacement – to remove, replace, and install. This is to match existing materials.
4. 05 31 00 s.f. 10 s.f.
Deteriorated Metal Decking replacement – 1-1/2” 22-gauge decking (Type A, B, F and Acoustic w/ Insulated Flute Fill) to remove, replace, and secure. This is to match existing materials. List all separately on the Bid Form.
5. 06 10 00 l.f. 1 l.f.
Deteriorated Wood Blocking replacement – (2x4, 2x6, 2x8, 2x10) to remove, replace, and secure. This is to match existing materials. List all separately on the Bid Form.

6. 06 10 00 l.f. 1 l.f.
Deteriorated Wood Decking replacement – (1x4, 1x6, 1x8) to remove, replace, and secure. This is to match existing materials. List all separately on the Bid Form.
7. 06 15 00 s.f. 16 s.f.
Deteriorated Fire-Treated CDX Plywood Decking / Sheathing replacement – (1/2" and 3/4") to remove, replace, and secure. This is to match existing materials. List all separately on the Bid Form.
8. 07 60 00 l.f. 20 l.f.
Deteriorated Masonry Through-Wall Flashing replacement – to remove, replace, and install. This is to match existing materials.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

- 1.01 SECTION INCLUDES identification of each Alternate by number and describes the basic changes to be incorporated into the Work if a particular alternate is made a part of the work by specific provisions in the Agreement between the Owner and the Contractor.
- 1.02 RELATED SECTIONS are referenced in the definition of each Alternate.
- 1.03 COORDINATION of related work and modifications to surrounding work as required to properly integrate each Alternate, and to provide the complete construction required by the Contract Documents, is the responsibility of the Contractor.
- 1.04 DESCRIPTION OF ALTERNATES:
- A. Alternate No. 1: “Old Gym Windows”
State the amount to be added to the Base Bid to remove the (8) existing metal windows and install (8) new aluminum “steel replica” windows. Please refer to and locate on the Construction Documents the Note “ALT #1”.
 - B. Alternate No. 2: “Aluminum Roof Ladder”
State the amount to be added to the Base Bid to design, manufacture and install a new aluminum roof access ladder over the Old Gymnasium Mansard roof to the upper level. Note the existing Metal mansard roof is under an active Roof warranty. Please refer to and locate on the Construction Documents the Note “ALT #2”.

END OF SECTION

SECTION 01 30 00

PROJECT MANAGEMENT & COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Drawings and general provisions of the Owner's Contract for Construction and other Division-1 Specification Sections apply to this Section.

1.02 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Administrative and supervisory personnel.
 - 2. General installation provisions.
 - 3. Cleaning and protection.
- B. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of schedules.
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.
 - 4. Progress meetings.
 - 5. Project Closeout activities.

1.03 SUBMITTALS

- A. Staff Names: Within fifteen (15) days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent, Project Managers, and other personnel assigned to the Project and in attendance at the site; identify individuals, their duties and responsibilities; list their email addresses and telephone numbers.
 - 1. Post copies of the list in the project meeting room, the temporary field office and at each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

- A. Pre-Bid Site Visit: A Pre-Bid Conference date and time will be issued via Addendum. Prospective bidders are advised to visit the site for the Pre-Bid Conference to become familiar with conditions under which the project will be constructed. Examine Campus items to be relocated or reinstalled. Verify all project requirements.

- B. Preconstruction conference:
1. The Designer and Owner will Schedule and conduct a preconstruction conference before starting construction. Discuss significant items that could affect progress, including, but not limited to, the following:
 - a. Tentative construction schedule;
 - b. Phasing;
 - c. Critical work sequencing and long lead items;
 - d. Designation of key personnel and their duties;
 - e. Procedures for processing field decisions and change orders;
 - f. Procedures for requests for information;
 - g. Procedures for testing and inspection;
 - h. Submittal procedures.
- C. Pre-installation conferences:
1. Conduct pre-installation conferences at project site before each construction activity that requires coordination with other construction.
 2. Review progress of other construction activities and preparations for the particular activity under consideration.
- D. Progress Meetings:
1. See Section 01 31 19 - Project Meetings.
- E. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- F. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations are more explicit of stringent than requirements contained in Contract Documents.
- G. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- H. Provide attachment and connection devices, blocking and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movements.
- I. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Engineer/Architect for final decision.
- J. Recheck measurements and dimensions, before starting each installation.
- K. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- L. Coordinate temporary enclosures with required inspections and test, to minimize the necessity of uncovering completed construction for that purpose.
- M. Mounting Heights: Where locations and mounting heights are not indicated, Refer to the Engineer/Architect for final decision.

3.02 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining material in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessively high or low temperatures.
 - 3. Excessively high or low humidity.
 - 4. Water or ice.
 - 5. Solvents.
 - 6. Abrasion.
 - 7. Heavy traffic.
 - 8. Soiling, staining and corrosion.
 - 9. Rodent and insect infestation.
 - 10. Combustion.
 - 11. Electrical current.
 - 12. High speed operations.
 - 13. Contact between incompatible materials.
 - 14. Excessive weathering.
 - 15. Unprotected storage.
 - 16. Improper shipping or handling.
 - 17. Theft.
 - 18. Vandalism.

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

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

1.02 RELATED WORK

- 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
- 2. The Contractor's relations with his subcontractors and materials suppliers and discussions relative thereto are the Contractor's responsibility and normally are not part of project meetings content.

1.03 SUBMITTALS

- A. Agenda Items: To the maximum extent practicable, advise the Architect at least 24 hours in advance of project meetings regarding items to be included on the agenda.
- B. Minutes: The contractor will compile minutes of each project meeting and will furnish three copies to the Architect and required copies to the Owner. Recipients of copies may make and distribute such other copies as they wish.

1.04 QUALITY ASSURANCE

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 MEETING SCHEDULE

- A. Except as noted herein for Pre-construction Meeting, project meetings will be held bi-weekly. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.02 MEETING LOCATION

- A. The Architect will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

3.03 PRE-CONSTRUCTION MEETING.

- A. Provide attendance by authorized representatives of the Contractor and major subcontractors. The Architect will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum Agenda: Data will be distributed and discussed on at least the following items.
 - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and the Architect.
 - 2. Channels and procedures for communication.
 - 3. Construction schedule, including sequence of critical work.
 - 4. Contract Documents, including distribution of required copies of original documents and revisions.
 - 5. Processing of Shop Drawings and other data submitted to the Architect for review.
 - 6. Processing of Bulletins, field decisions, and Change Directives.
 - 7. Rules and regulations governing performance of the Work.
 - 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.
- C. Project Meetings
 - 1. Attendance
 - a. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
 - b. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.
 - 2. Minimum Agenda
 - a. Review, revise as necessary, and approve minutes of previous meetings.
 - b. Review progress of the Work since last meeting, including status of submittals for approval.
 - c. Identify problems that impede planned progress.
 - d. Develop corrective measures and procedures to regain planned schedule.
 - e. Complete other current business.
- D. Revisions to Minutes
 - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting; they will be accepted as properly, stating the activities and decisions of the meeting.
 - 2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
 - 3. Challenge to minutes shall be settled as priority portion of "old business" at the next regularly scheduled meeting.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - DEFINITIONS

1.1 ACTION SUBMITTALS

Written and graphic information and physical samples that require Company representative's responsive action.

1.2 INFORMATIONAL SUBMITTALS

- A. Written and graphic information and physical samples that do not require responsive action.
- B. Submittals shall be rejected for not complying with requirements.

PART 2 - GENERAL

2.1 RELATED DOCUMENTS

Drawings and general provisions of the Owner's Contract for Construction and other Part - 1 Specification Sections apply to this Section.

2.2 SUBMITTAL PROCEDURES

- A. Coordination:
 - 1. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Engineer/Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 - b. Allow 2 weeks for processing each submittal. Allow additional time if the Engineer/Architect must delay processing to permit coordination with subsequent submittals.
 - c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer/Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation:

Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
- C. Submittal Transmittal:

Transmit each submittal from the Contractor to the Architect/Engineer using a transmittal form.

 - 1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.

2. Submittals may be submitted via email. If submitted via email, Contractor to use Project School Name, (i.e. "Sherwood") in the subject line along with product/ submittal name or division number. No exceptions.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule:
Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule for the Owner's approval. Submit within 30 days after the date established for "Commencement of the Work."
 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
 2. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
 3. Indicate completion in advance of the date established for Substantial Completion.
 4. Indicate Substantial Completion on the schedule.
- B. Distribution:
Following acceptance of the formatting of the initial submittal, print and distribute copies to the Engineer/Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 1. When revisions are made, distribute to the same parties as required.
- C. Schedule Updating:
Revise the schedule monthly. Revised Schedules should reflect each event or activity where approved revisions have been recognized or made. Issue the updated schedule in reduced form for attachment to the Minutes of each Progress Meeting.

2.4 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 7 calendar days of the date required for submittal of the Contractor's Construction Schedule.
 1. Prepare the schedule in chronological order, include submittals required during the first 90 days of construction. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Name of the subcontractor.
 - c. Scheduled date for the Engineer/Architect's final release or approval.
- B. Distribution:
Following response to the initial submittal, print and distribute copies to the Engineer/Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

2.5 SHOP DRAWINGS

- A. Submit shop drawings, product data, samples, and other submittals where required in other sections of this document.

- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
1. Dimensions.
 2. Identification of products and materials included by sheet and detail number.
 3. Compliance with specified standards.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.
 6. One (1) of the prints returned shall be marked up and maintained as a "Record Document."
 7. One (1) print of each Drawing and one sample bearing the final approval stamp of the Engineer/Architect shall be kept at the project office and shall be maintained in good condition. No Shop Drawing or sample other than those stamped "Approved," shall be on the job for any purpose whatsoever, and work installed directly from shop Drawings or samples shall be removed and corrected at no charge in contract price.
- C. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- D. In checking Shop Drawings and samples, the Engineer/Architect shall not be required to check dimensions, quantities, electrical characteristics, specific capacities or coordination with other trades, these being the responsibility of the Contractor. The Contractor shall attest, either in writing or by stamp or signature, that all Shop Drawings and samples submitted for approval have been checked for compliance with the Drawings and Specifications prior to submission to the Engineer/Architect. Otherwise, they will be returned unchecked. Any deviations in Shop Drawings shall be identified by letter accompanying Drawings. No Shop Drawings nor samples shall be submitted directly to the Engineer/Architect from a manufacturer, jobber or subcontractor.

2.6 GENERAL CONTRACTOR'S RESPONSIBILITY FOR DIMENSIONS

Dimensions shown in shop drawings will be reviewed (and revised if necessary) by the Engineer/Architect, solely as a convenience to the General Contractor. This in no way releases the General Contractor from his responsibility for providing correct dimensions on the shop drawings, in accordance with the Construction Documents, or from his responsibility to coordinate such dimensions with the work of other trades, and any field conditions which may affect the dimensions indicated in the shop drawings.

2.7 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
1. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- B. Submittals:
1. Submit five (5) hard copies of each required submittal; submit 5 copies where required for maintenance manuals. The Engineer/Architect will retain one and will return the other marked with action taken and corrections or modifications required.
 2. Unless noncompliance with Contract Document provisions is observed, the

submittal may serve as the final submittal.

3. Contractor may submit electronic copy of submittal if acceptable by Architect or Engineer.

C. Distribution:

1. Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
2. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
3. Do not permit use of unmarked copies of Product Data in connection with construction.

2.8 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. Include the following:
 - a. Sample source.
 - b. Product name or name of the manufacturer.
 - c. Compliance with recognized standards.
 - d. Availability and delivery time.
2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual components as delivered and installed.
3. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.

B. Preliminary Submittals:

1. Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.
2. The Architect or Engineer will review and return preliminary submittals with the Architect or Engineer mark, indicating selection and other action.

C. Submittals:

1. Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. The Architect or Engineer will return one set marked with the action taken.
2. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.
3. Sample sets may be used to obtain final acceptance of the construction associated with each set.

D. Distribution of Samples:

Prepare and distribute additional sets to as required for performance of the Work.

E. 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.

- F. Coordinate preparation and processing of submittals with performance of construction activities. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. Allow time for submittal review, including time for resubmittals.

2.9 ARCHITECT/ ENGINEER'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Engineer/Architect will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp:
The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp of the Engineer/Architect on returned Shop Drawings and samples shall be interpreted as follows:
 - 1. Approved: Conforms to design concept of the project.
 - 2. No Exceptions Noted: Conforms to design concept of the project.
 - 3. Approved as Noted: Items noted for correction must not be fabricated or furnished with correction as noted.
 - 4. No Exceptions Taken Revised As Noted: Items noted for correction must not be fabricated or furnished without correction as noted.
 - 5. If the above comments are offered Fabrication/ Installation may be undertaken.
 - 6. Revise and Resubmit or Rejected: The item is rejected as not in accordance with the contract requirement, or for other justified cause. The submission shall be corrected and resubmitted. No item is to be fabricated or furnished under this stamp.
 - 7. If the above comments are offered Fabrication and/ or Installation may not be undertaken.
 - 8. List of Subcontractors: Submit list of subcontractors as required by Instruction to Bidders.
- C. Occupancy Permit: Submit Occupancy Permit as required by Section 01 77 00 – Closeout Procedures.
- D. Other Submittals: (Where Applicable)
 - 1. Shop Drawings and drawings, diagrams, illustrations, schedules, performance charts, nomenclature charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, fabricator, or distributor and which illustrate some portion of the project.

2.10 REQUIRED SUBMITTALS

- A. Submittals required by the Contract Documents include, but are not necessarily limited to:
 - 1. Proposed Progress Schedule
 - 2. Schedule of Values
 - 3. List of Subs and Suppliers
 - 4. Construction Waste management Plan
 - 5. Contract Closeout Items
 - 6. Project Record Documents
 - 7. Manuals
 - 8. Product Data, Mix Designs
 - 9. Product Data, Shop Drawings
 - 10. Steel Shop Drawings

11. Concrete Mixes
12. Masonry
13. Storefront Systems
14. Curtain Wall Systems
15. Door, Frame & Hardware
16. All Material & Finishes
17. Plumbing Systems
18. Fire protection Systems
19. HVAC Systems
20. Electrical Lighting
21. Electrical Power Systems
22. Electrical Life Safety Systems

- B. Refer to individual product specification sections for additional required submittals.
- C. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01 72 00 Project record Documents and 01 77 00 – Closeout Procedures.
- D. Provide Owner and Manager of Design and Construction with one (1) Electronic USB in AutoCAD DWG FILE Format of ALL As-Built Documents USB MUST NOT BE READ ONLY. USB MUST BE AN AUTO CAD DWG FILE FOR OWNER PURPOSES AND RECORDS.

PART 3 - PRODUCTS (NOT USED)

PART 4 - EXECUTION

4.1 SUBMITTALS REUIQRED BEFORE OR WITH FIRST INVOICE:

- A. Construction Schedule.
- B. List of Subcontractors and Suppliers.
- C. Staging Area(s) for Contractor's Equipment, Materials, Appurtenance(s), Products, Contractor's Circulation Pattern(s) to and from Staging Areas to avoid interface and impact with Owner's Site Based Personnel and all persons related to Site Based Personnel.
- D. Contractor's Documents showing ALL Safe travel zones for ALL Site Based Persons prior to, during, and following ingress to the Project Site and Project Building and ALL egress from the Project Site and Project Building.
- E. Contractor's to show ALL safety fencing necessary to separate ALL Site Based Persons and ALL Persons related to Site Based Persons from Contractor's Work Areas/Zones.

4.2 SHOP DRAWINGS

- A. Shop drawings shall be submitted for review and comments as noted under all sections listed.
- B. Miscellaneous Submittals Required:
 1. Inspection and Test Reports
 2. Warranties
 3. Survey Data

4.3 CLOSE-OUT DOCUMENTS BEFORE FINAL INVOICE

Refer to section 01 77 00 Closeout Procedures and to individual sections of these specifications for specific submittal requirements of project closeout information, materials, tools and similar items.

PART 5 - SUMMARY

5.1 This Section includes administrative and procedural requirements for submittals required for performance of the Work, including but not limited to the following:

1. Contractor's construction schedule.
2. Submission of Progress Schedule.
3. Submittal schedule.
4. Shop Drawings.
5. Product Data.
6. Samples.

B. Administrative Submittals:

Refer to other Part - 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits.
2. Applications for Payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of subcontractors.

C. Progress Reports:

1. Daily Reports:

Progress reports shall be kept on a daily basis to cover each facet of the work. These reports shall be kept on file at the field office and shall be made available for review upon request of the Engineer/Architect or his representative.

D. Proposed Products List:

1. Within 20 days after date of Owner-Contractor Agreement submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number or each product.
2. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

END OF SECTION

SECTION 01 33 10

CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. SCHEDULE(S)

A schedule shall be provided as a basis for a detailed construction schedule. The detailed construction schedule shall conform to the construction sequence as outlined in other sections of these specifications.

B. DESCRIPTION

Utilize a computer-generated schedule for the planning and scheduling of all work required under the Contract Documents. In addition to construction activities, detailed network activities shall include the submittal of shop drawings, catalog cut sheets, and materials samples, review and approval of these submittals, and fabrication and delivery of materials and equipment. Work by separate contractors and project close-out activities shall also be included to account for their effect on the overall sequencing of the project.

1.2 SCHEDULE STANDARDS

A. The schedule shall demonstrate a logical succession of work from start to finish. Constrained start and finish dates shall be kept to a minimum, such that the schedule logic (activity relationships and durations) will determine the schedule start and finish of each activity.

B. The durations indicate for each activity shall be in "work - days" and shall represent the required time for the activity considering the scope of work and resources planned for the activity including time for inclement weather and other predictable delays.

C. Multiple calendars shall be utilized as required to allow for specific times of the week, month, or year when specific activities can or cannot be accomplished. Specific examples include, but are not necessarily limited to, Site Based (School) activities which require no noise such as school testing timeframes, and other site-based activities which require same considerations, confirm with the Architect, Construction Procurement Department, and Major Construction Manager regarding additional timeframes which require Site Based (School) activities to take priority over various parts of this Project.

1.3 QUALIFICATIONS

A. Submit evidence of in-house scheduling capability per Owner's Requirements for Project Scheduling.

B. Verify in-house capability by description of this project to which Contractor or Contractor's has successfully applied scheduling techniques for this Project. Include one (1) project which was controlled throughout the duration of the project by means of computerized, periodic, systematic schedule.

C. Submit the requirements of the Section to the Architect, Engineer and Director of Major Construction for MSCS with the Contractor's Bid Documents.

PART 2 - PRODUCT**2.1 GENERAL**

Provide Architect and Director of Major Construction with required number and product information as identified within other Sections of these Specifications.

PART 3 - EXECUTION**3.1 GENERAL**

- A. Prepare a computer-generated schedule of all construction related work required by this contract.
- B. Include the following information in the database for each activity:
 - 1. Activity Description - should indicate type of work being performed and general location or phase.
 - 2. Calendar - the standard calendar is a five-day work week (5). Other calendars have been determined including school year, vacation, student relocation, etc.
 - 3. Duration - should indicate "work - days" required to accomplish the task.
 - 4. Schedule Dates - Early Start, Early Finish, Late Start, and Late Finish for each activity will result from the calculation of the schedule.

3.2 SCHEDULE PROCEDURE

- A. Time of Submittals:
 - 1. Within Five (5) working days after Notice to Proceed, the Contractor shall submit its project schedule for review. The schedule produced and submitted shall indicate interim milestone and completion dates identical to the milestones required by the contract. The Architect and Director of Major Construction will review the schedule within ten working days and state acceptance or rejection of the schedule.
 - 2. Within ten working days after the conclusion of the Architect's and Director of Major Construction's review, the Contractor shall revise the schedule as required and resubmit. This schedule shall constitute the project Work schedule unless a revised schedule is required due to substantial changes in work or contract time, delinquency by the Contractor requiring a recovery schedule, or as otherwise provided.
 - a. Acceptance of the project schedule will be required prior to the processing of any application for payment.
 - 3. Submit a copy of the schedule, clearly showing progress made during the previous month along with the Application for Payment.
- B. Acceptance of Schedule:
 - 1. The schedule will be acceptable when it provides an orderly progression of the work to completion in accordance with the contract requirements, adequately defines the Contractor's work plan, and provides a workable arrangement for the processing of submittals in accordance with the requirements.
 - 2. Review and acceptance of the Contractor's project schedule is for conformance to the requirements of the contract documents only. It does not relieve the Contractor of any responsibility for the accuracy or feasibility of the project schedule, or of the Contractor's ability to meet the interim milestone dates and contract completion date, nor does such review and acceptance expressly or implicitly warrant, acknowledge, or otherwise admit the reasonableness of the logic or durations of the Contractor's project schedule.
- C. Submittal Items:

1. Initial submittals shall include the following:
 - a. Bar Chart Graphic Report - include all activities for the entire project. Sort by early start, early finish, and total float; organize by submittal activities, construction activities, etc. Include activity ID, description, original duration, early start, early finish, and total float. Individual pages shall not exceed 11 inches by 17 inches.
 - b. Back-up DWG - Electronic (USB) (NOT "PDF" READ ONLY) containing schedule back-up.
 - c. Reports shall be submitted in triplicate plus any copies to be returned to the Contractor.
 2. Monthly submittals to be included with Application for Payment shall include the following:
 - a. Project Narrative. Report - shall include a brief description of work that was accomplished during the previous month as well as work to be pursued during the upcoming month.
 - b. Bar Chart Graphic Report - shall be a three-month (3) look ahead schedule to include previous month's progress plus work to accomplish during the two months following the data date. Schedule bars shall be compared to the initial schedule as a baseline. Include the same activity information as in initial bar chart graphic report.
 - c. Back-up DWG - Electronic (USB) (NOT "PDF" READ ONLY) containing schedule back-up.
 - d. Reports shall be submitted in triplicate plus any copies to be returned to the Contractor.
- D. Schedule Revisions:
1. No changes may be made in the sequence, duration, or relationship of any activity without the acceptance of the Architect and Director of Major Construction. Requests for minor changes to the schedule may be submitted in the form similar to the schedule form identified herein. More substantial revisions will require re-submittal of the entire schedule.
 2. If at any time the Architect and Director of Major Construction considers the milestone or completion dates to be in jeopardy because of work activities behind schedule, the Contractor shall provide a revised Critical Path Work Schedule, including resource requirements, to show how the Contractor intends to bring the project back on schedule. "Activities behind schedule" are any activities whose current schedule early dates are later than indicated in the initial schedule.
 3. If a change directive has a schedule impact, that impact shall be submitted with the change directive request in the form of a fragment that adequately indicated the effect of the change on the original schedule. If a fragment cannot adequately delineate the schedule impact, re-submittal of the entire schedule may be required.

3.3 SCHEDULE MAINTENANCE

- A. Updating the Schedule At not less than one (1) month intervals, or when specifically requested by the Architect or Director of Major Construction, the Contractor shall perform a schedule update. Progress of the project shall be evaluated as of the last Sunday of the month (the data date). The updating process shall evaluate the status of each activity, noting actual start dates, actual finish dates, and remaining durations. After this data is input the schedule shall be calculated as of the data date. It is suggested that due to the

nature of these projects, the Contractor perform a mid-month update as well, to assure that the project does not fall behind schedule.

- B. Schedule Monitoring - The updated schedule shall be utilized for the monthly reports as required under "submittals." Monthly updates will be compared to the original (baseline) schedule and the previous month's update to evaluate progress.
- C. Progress Meetings - For the progress meetings held every other week (Bi-weekly), the Contractor shall prepare a three (3) week look-ahead schedule based on the latest updates of the schedule. This three-week schedule shall show all activities in progress, uncompleted, or scheduled to be worked on during the three-week period. The three weeks shall include the current week plus the next two (2). The purpose of the meetings is to review the progress of work and resolve potential problems to avoid delays.

END OF SECTION

SECTION 01 33 20
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Still Photography
- B. Prints
- C. Submittals

1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary of Work
- B. Section 01 33 00 – Submittals

1.03 PHOTOGRAPHY

- A. Still Photography
 - 1. Existing Conditions: Provide Photographs of site and existing buildings (interior and exterior) before any construction is started. This includes the surrounding streets and sidewalks and other areas that could be damaged by construction traffic for this project.
 - 2. Progress Photographs: Take photographs of work associated with each monthly Application for Payment.
- B. Prints:
 - 1. Digital prints are acceptable in PDF format.
 - 2. Paper: white base
 - 3. Size: 3-1/2" x 5" inch
 - 4. Identify each print on back on below image with Name of Project, Contract Number, Phase, Orientation of View, Date and Time of View.

1.04 TECHNIQUE

- A. Provide Factual Presentation.
- B. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- C. Provide monthly progress photographs from views until Substantial Completion. Consult with Architect for instructions on views required.

1.05 SUBMITTALS

- A. Provide PDF digital document of all images.
- B. Deliver prints of Existing Conditions within 10 days of NTP.
- C. Deliver prints of progress photographs with each Application for Payment.

PART 2 - PRODUCTS

2.01 MATERIALS

A. NOT USED

PART 3 - PART 3 EXECUTION

3.01 GENERAL

A. NOT USED

END OF SECTION

SECTION 01 40 00
QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Field samples.
- D. Mock-up.
- E. Inspection and testing laboratory services.
- F. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

- A. Section 01 33 00 - Submittals: Submission of Manufacturers' Instructions and Certificates.
- B. Section 01 60 00 - Products: Requirements for material and product quality.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer and Manager of Design and Construction before proceeding with work.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Obtain copies of standards when required by Contract Documents.
- C. Should specified reference, standards conflict with Contract Documents, request clarification for Architect/Engineer before proceeding.

- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 FIELD SAMPLES

- A. Install field samples at the site as required by individual specifications. Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Architect/Engineer and the Manager of Design and Construction.

1.06 INSPECTION AND TESTING LABORATORY SERVICES

- A. Contractor will appoint, employ, and pay for services of an independent firm approved by the Architect/Engineer and Manager of Design and Construction to perform inspection and testing.
- B. The independent firm will perform inspections, tests, and other services specified in these specification Sections and as required by the Architect and Manager of Design and Construction.
- C. Reports will be submitted by the independent firm to the Owner, the Architect and to the Manager of Design and Construction and any other parties deemed by the Architect and Manager of Design and Construction, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents or information issued by the Architect and Manager of Design and Construction.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - 1. Notify Architect/Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price.

1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. Observer subject to approval of Architect/Engineer and Manager of Design and Construction.
- B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, test(s), and to initiate instructions when necessary.
- C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

- D. Submit report in duplicate within 30 days of observation to Architect/Engineer and Manager of Design and Construction for review.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 CODES AND REGULATIONS

A. The Regulatory Requirements used for Memphis Shelby County Schools projects are listed below as a convenience and may not be inclusive of all that apply. Others may also apply. Comply with all pertinent codes, standards, regulations and laws:

1. 29 CFR 1910 - Occupational Safety and Health Standards; current edition; as a workplace.
2. Tennessee State Fire Marshal Codes:
 - a. 2012 International Building Code (Except: Chapter 11 & 3411)
 - b. 2012 International Existing Building Code
 - c. 2017 National Electrical Code
 - d. 2012 International Gas Code
 - e. 2012 International Mechanical Code
 - f. 2012 International Plumbing Code
 - g. 2012 International Energy Conservation Code
 - h. 2012 International Fire Code
 - i. 2012 NFPA-101: Life Safety Code
United States Department of Justice: 2010 ADA Standards for Accessible Design, Title III Regulations 28 CFR Part 36 - For Public Buildings
3. Local Codes:
 - a. 2021 International Building Code (W/ Local Amendments)
 - b. 2021 International Exist. Building Code (W/ Local Amendments)
 - c. 2020 National Electrical Code (W/ Local Amendments)
 - d. 2021 International Gas Code (W/ Local Amendments)
 - e. 2021 International Mechanical Code (W/ Local Amendments)
 - f. 2021 International Plumbing Code (W/ Local Amendments)
 - g. 2021 International Energy Con. Code (W/ Local Amendments)

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Control.

1.03 QUALITY ASSURANCE

A. Designer Qualifications: Where delegated engineering design is to be performed under the construction contract provide the direct supervision of a Professional Engineer experienced in design of this type of work and licensed in Tennessee.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 01 45 00

LABORATORY TESTING AND FIELD INSPECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Employment and payment of an independent testing laboratory for specified services shall be by the Contractor. This laboratory will perform all testing and inspection required by the specifications.
- B. Payment: The Contractor shall be reimbursed for any additional testing required by Shelby County Schools or other government agency having jurisdiction which are not required by the specifications.

1.02 TESTING REQUIRED

- A. All Special Inspections required by the International Building Code, Memphis and Shelby County Office of Construction Code Enforcement and/ or the Tennessee State Fire Marshal's office.
- B. Special Inspection Testing required per Sheet S0.1 and S0.2 in Drawings.
- C. Concrete under Division 03 - Concrete.
- D. Mortar and masonry under Division 04 - Masonry.
- E. Steel welding under Division 05 - Metals.
- F. Fireproofing under Division 07 - Thermal and Moisture Protection.

1.03 LABORATORY QUALIFICATIONS: Meet "Recommended Requirements for Independent Laboratory Qualifications" as published by the American Council of Independent Laboratories.

1.04 REPORTS: The testing laboratory will provide copies of all reports to the Contractor, the architect, and the Shelby County Schools Representative.

1.05 RETESTING: Retesting of areas not conforming to the specifications will be by the testing laboratory but will be at the expense of the Contractor.

1.06 RE-INSPECTION: Visits for re-inspection of an area will be by the testing laboratory but will be at the expense of the Contractor.

1.07 COORDINATION: Contractor shall coordinate with the testing laboratory to schedule tests and inspections.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

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

1.02 SUMMARY

- A. This Section specifies requirements for temporary services and support facilities, including utilities, construction and support facilities, security and protection as necessary for the proper execution of the work.

1.03 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations.
 - 1. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library, "Temporary Electrical Facilities."
 - a. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
 - 2. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain certifications and permits.

1.04 SUBMITTALS

- A. Vermin Control Plan: Submit for approval the Contractor's plan(s) for controlling vermin during construction.
- B. Parking for Construction Vehicles: Submit for approval the Contractor's and subcontractor's plan(s) showing where the workers will park (if allowed by the Owner) their respective personal, company, and equipment vehicles while Contractors and subcontractors are working at and on the Project Site and at and around Project Site Building(s).
- C. Control of Dust and Mud: Submit for approval the Contractor's plan(s) detailing how the Contractors will control dust and mud. Show where dust and mud catchments point(s) will be located and where the temporary water hose will be located and from where the temporary water and Cleaning Material Solution(s) will be piped. Detail ALL other aspects of Contractor's plan(s).
- D. Roads on Site: Submit for approval the Contractor's plan(s) showing where the Contractor's and subcontractor's proposes to install any Temporary Vehicle Access (if applicable and allowed by Owner) within and on the Project Site leading to, within and exiting from the Project Site and Building(s) to perform and complete ALL work for this project.
- E. Set-up and Breakdown Area(s): Submit for approval the Contractor's plan(s) showing ALL locations where Contractors will set up Equipment, Materials, Products, Appurtenances, Etc. along with ALL drawing(s) showing ALL movement(s) of their respective Equipment, Materials, Products, Appurtenances, Etc. by the Contractor's and subcontractor's to the

respective Contractor's and subcontractor's work area(s) for this Project.

1.05 PROTECTION AND USE OF SITE

- A. The Contractor shall confine operations at the site to the areas designated for his use on the Drawings. He shall not interfere with the operations of surrounding buildings and shall not unreasonably clutter the site with materials or equipment.
- B. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner.
- C. Should any damage occur, Contractor shall restore such to its original condition in a manner acceptable to the Owner.
- D. Take adequate precautions against fire. Keep flammable material at an absolute minimum and ensure that such material is properly handled and stored. Except as otherwise provided herein, do not permit fires to be built or open salamanders to be used in any part of the work.
- E. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-site.
- F. The Contractor shall call the local utilities departments and Campus Physical Plant to help in identifying the location of all hidden utilities and services including, security and landscape irrigation systems. Any damage to these areas, either marked or unmarked, is the responsibility of the Contractor. The Contractor shall notify the Designer and Owner immediately and make all attempts to repair the damage.
- G. The Contractor is to protect all areas including but not limited to Roofs that are under warranty, landscaping, sod and grass areas, irrigation lines and sprinkler heads, existing structures, outdoor furniture, vehicles, concrete and asphalt surfaces. Any damage to these areas is the responsibility of the contractor and shall be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. General: Provide new materials; if acceptable to the Architect, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for use intended.
- B. Lumber and Plywood: Provide exterior type, Grade B-B High Density Concrete Form Overlay.
- C. Plywood conforming to PS-1, of sizes and thickness indicated.
- D. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- E. Water: Provide potable water approved by local health authorities.

- F. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 8-feet high and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts as required.
- G. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- H. First Aid Supplies: Comply with governing regulations.
- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class "ABC", dry-chemical extinguishers or a combination of extinguishers of NFPA recommended classes for the exposures.
- J. Temporary Heating: Provide heat, fuel and services as necessary to protect all work and materials against injury from dampness and cold until final acceptance of all work and material in the contract. The Contractor shall provide heat as follows:
 - 1. At all times during the placing, setting and curing of concrete, provide sufficient heat to ensure the heating of the space involved is not less than 50 degrees Fahrenheit.
 - 2. For a period of ten (10) days prior to the installation of interior finishing, varnishing, painting, spackling, etc., and until final acceptance of the work or until full occupancy by Owner, provide sufficient heat to maintain a temperature of not less than 68 degrees Fahrenheit.
- K. Temporary Ventilation: Provide adequate forced ventilation of enclosed areas for cutting of installed materials, to disperse humidity and to prevent hazardous accumulation of dust, fumes, vapors or gases.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

- A. The term "utility lines" shall be understood to include, but shall not be limited to, water lines, gas lines, sanitary sewers, electric power lines, communication lines and appurtenances such as manholes, catch basins, fire hydrants, valves, junction boxes and switches.
- B. Subject to availability and Owner's consent, the Contractor will be allowed to use existing utilities, including; water, power and temporary heat if tied into a central system, subject to the following restrictions:
 - 1. The Owner will have the right to direct tap points and identify panels and other services that the Contractor may use.
 - 2. The Contractor will be responsible for installation, maintenance and removal of temporary services.
 - 3. The Owner will have the right to restrict use in time of emergency or for repeated abuse by the Contractor.

- C. Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
- D. Telephone service (cell) shall be maintained from start to completion of work. The cost of the telephone service shall be paid by the Contractor.

3.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities in area indicated on site plan or as instructed by Owner during pre-construction meeting.
 - 1. The Contractor shall coordinate a construction staging area & use qualified tradesmen to install temporary facilities, control as required to provide orderly use. The Contractor and their employees should under NO circumstances park in Faculty or Staff Parking areas.
 - 2. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Field Offices will not be required at job site, but is allowed in designated areas only. However, the Contractor is still responsible for maintaining a check-in point for all employees, Owner, Architect and other job site visitors. The Contractor is also responsible for maintaining a proper use and storage area for Construction Documents, Specifications, Shop Drawings and field records. The Owner will provide the use of existing areas, when requested, for small progress meetings including tables and chairs for reviewing drawings.
- C. Sanitary facilities including toilets, wash facilities and drinking water fixtures will be provided by the Contractor and installed in designated areas only.
- D. Provide watertight and secure storage sheds as necessary to hold materials to be protected while stored on site. Location of all sheds shall be approved by the Owner.
- E. Install temporary paving if needed to gain access to work areas and to minimize damage or deterioration to permanent roads, paved areas and landscape/sodded areas.
- F. Provide temporary, weathertight enclosures for protection of construction in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
- G. Project identification and other signs of size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
- H. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80 °F (27 °C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

- I. Night covers and/or temporary covers for unfinished work are the responsibility of the Contractor. Unfinished work shall be covered to protect the area from, but not limited to rain, wind, high or low temperatures, trip hazards, and vandalism. If an area being repaired is halted for an unforeseen condition or RFI, the contractor shall be prepared to cover and protect the area until the Designer can visit the site and make recommendations to the owner. If a change order is needed, it could take several days to gain approval.
- J. Temporary Ceilings: Install in spaces where needed to preventing falling debris during reroofing projects from damaging or compromising critical spaces similar but not limited to, spaces open to structure, food prep and service, spaces under FDA regulations, electronics, computer and equipment rooms. Ceiling shall be hung from the joists and fully sealed around all penetrations to protect the interior of the facility. Material shall be Classified to UL 723S for installation below sprinkler systems and meets NFPA 13.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.
- B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
 - 4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
 - 1. TEMPORARY SOIL EROSION: Control soil erosion during construction as required by the Tennessee Department of Environment and Conservation, Division of Water Pollution Control.
 - 2. STORMWATER BUREAU LETTER OF INTENT: Contractor must adhere to the any requirements from the Owner or TEDEC regarding erosion control.
 - 3. CONSTRUCTION STORM WATER GENERAL PERMIT: Contractor must adhere to all conditions of the TEDEC Storm Water Prevention Plan, including inspections and submittals of inspection reports.

- E. Maintenance of Traffic and Circulation: Maintain circulation of traffic, both pedestrian and vehicular, and access to all parts of the site by fire-fighting apparatuses during construction.
- F. Control of Dust and Mud:
 - 1. Control construction vehicle traffic by establishing only one entry/exit point on and off Owner's Property.
 - 2. Use watering trucks to apply water on exposed dirt which can become airborne dust. Use as often as necessary and required as deemed necessary and required by the Owner, Contractors, and subcontractors to control dust on the site.
 - 3. Contractors, subcontractors, ALL other workers for this project MUST Clean-wash ALL Construction Vehicles and ALL other Contractor's Vehicles and Equipment OFF-SITE and NOT ON OWNER'S PROPERTY. Contractors and subcontractors MUST submit to the Owner, Contractor's and subcontractor's plan(s) showing use of a filtering device at each storm drain inlet on Owner's Property, and adjacent streets to prevent clogging the storm sewer pipes with mud, debris, excess cleaning solutions, products, etc.. If the adjacent road(s) becomes muddy, the Contractors and subcontractors must wash down the road(s) to the satisfaction of the Owner. This cleaning shall extend as far as necessary to remove all mud and dirt generated by this project as well as protection of inlets of same roads. Use water trucks and sweeping trucks as necessary to provide water for washing roads.
- G. Vermin Control: During construction, the Contractor shall keep the building and the area of the construction free from food scrapes and similar organic matter which would attract vermin. He shall take measures necessary to prevent infestation of the building.

3.05 OPERATION, TERMINATION, AND REMOVAL

- A. Maintain facilities in good operating condition until removal. Protect from damage by Freezing temperatures and similar elements.
- B. 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.
 - 1. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired. Finish grade and sod any areas where temporary items had been located.
 - 1. Materials and facilities that constitute temporary facilities are property of the Contractor's property. The Owner reserves the right to take possession of project identification signs.

END OF SECTION

SECTION 01 60 00

PRODUCTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- C. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Substitutions and Product Options" below.

1.02 REQUIREMENTS INCLUDED

- A. Conform to applicable specifications and standards.
- B. Comply with size, make, type and quality specified, or as specifically approved in writing by Architect.
- C. Manufactured and Fabricated Products:
 - 1. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - 2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - 3. Two (2) or more items of the same kind shall be by the same manufacturer and identical.
 - 4. Products shall be suitable for service conditions.
 - 5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by the Architect.
- D. Do not use material or equipment for any purpose other than that for which it is designed or specified.

1.03 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- C. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature that is current as of the date of the Contract Documents.
- D. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

- E. "Equipment", is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
- F. Proof of Compliance: Where the specifications require accordance with Federal Specification, ASTM designation, ANSI Specification, or other association standard, the Contractor shall present and affidavit from the manufacturer certifying that the product complies therewith. Where requested or specified submit supporting test data to substantiate compliance.

1.04 MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including copies to Architect and Contractor. Maintain one (1) set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformance with specified requirements.
- C. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions. Do not proceed with work without clear instructions.
- D. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents, or Architect's written instructions.

1.05 SUBMITTALS

- A. Product List Schedule: Prepare a schedule showing products in a tabular form acceptable to the Engineer/Architect. Include the generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.
- B. Initial Submittal: Within 15 days after date of commencement of the Work, submit 3 copies of an initial product list schedule.
- C. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.
- D. Completed Product Schedule: Within 30 days after date of commencement of the Work, submit 3 copies of the completed product list schedule.
- F. Engineer/Architect's Action: The Engineer/Architect will respond in writing to the Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Engineer/Architect's response will include the following:
 - 1. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.06 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B. Wherever in the Specifications or on the Drawings a material or article is specified or

shown by using the name of a proprietary product or a manufacturer or vendor, the item named is intended to set standard of design, substance, performance and quality of such material or article.

- C. Contractors may propose equal substitutions for all products called for in any Section of this Specification, whether or not the Section so states. He is encouraged to do so when a substitution would result in a savings to the Owner with no sacrifice of quality or design intent.
- D. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.07 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Submit to the Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.
- B. Contractor's Options:
 - 1. For Products specified only by reference standard, select any product meeting that standard.
 - 2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers names, which complies with the Specifications.
 - 3. For Products specified by naming one (1) or more Products or manufacturers, Contractor must submit a request for substitutions for any Product of manufacturer not specifically named.
 - 4. For products specified by naming only one (1) product or manufacturer, there is no option.
- C. Substitutions:
 - 1. For a period of fifteen (15) days after Contract Date, the Architect will consider written requests for substitution of Products.
 - 2. Submit a separate request for each Product, supported with complete product data, with Drawings and samples as appropriate, in accordance with Section 01 33 00.
- D. By making requests for substitutions, Contractor:
 - 1. Represents that he has personally investigated the proposed substitute product and determined it is equal or superior in all respects to that specified;
 - 2. Represents that he will provide the same warranty for the substitute that he would for that specified;
 - 3. Certifies that the cost data presented is complete and includes all related costs, and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently becomes apparent; and
 - 4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
- E. The Architect will promptly reply in writing to the Contractor stating whether the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents. All products furnished by the listed manufacturer must conform to such requirements.
- F. When a material, equipment or system is approved by the Architect for substitution, such material, equipment or system shall become an essential element of the Contract. The

Architect will be the final judge of the acceptability of the substitution. The Architect is under no obligation to consider accept any proposed substitution, and he may reject any requested substitution for any cause or no cause. No substitution shall be made without authority in writing from the Architect.

1.08 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- D. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- F. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store products, subject to damage by the elements, in weather tight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- G. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- H. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
- I. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
- J. Materials, products and equipment shall be properly containerized, packaged, boxed and protected to prevent damage during transportation and handling.
- K. Exterior Storage:
 - 1. Store fabricated products above ground, on blocking or skids; prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
 - 2. Store loose, granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.
- L. Provide substantial coverings as required to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
 - 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and other devices and details needed for complete installations and for the intended use and effect.
 - 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
 - 1. Proprietary Specification Requirements: Where only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
 - a. Where products or manufacturers are specified by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
- C. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
 - 1. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- D. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes, or regulations specified.
- E. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Engineer/Architect will select the color, pattern, and texture from the product line selected.
- F. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

2.02 NO-ASBESTOS/NO LEAD REQUIREMENTS

- A. No asbestos-containing or lead-containing materials or products shall be incorporated into the project. All products and materials shall be 100% asbestos free and 100% lead free.
- B. The intent of the Contract Documents is to exclude all materials and products which contain asbestos or lead in any form or amount. In studying the Contract Documents and at any time during execution of the Work, the Contractor shall at once report to the Architect any asbestos-containing materials or products that he may discover. Do not proceed with installation of asbestos-containing materials or products or lead-containing materials or products.

- C. Where products are specified by reference standard or in a descriptive manner without manufacturer's name, model number or trade name, Contractor shall select materials or products meeting specified requirements which do not contain asbestos or lead in any form or amount.
- D. In making requests for substitutions, Contractor shall be responsible for determining that materials and products requested for substitution are 100% free of asbestos and lead in any form.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 65 00

STARTING OF SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes all material and labor to clean, inspect and adjust in accordance with manufacturer's written recommendations every piece of equipment, control/safety device and system.
- B. Testing, adjusting and balancing of HVAC systems, although specified elsewhere, is part of this section.
- C. Code required disinfecting of potable water systems, although specified elsewhere, is a requirement of this section.
- D. After completion of all requirements of A, B, and C above, the Contractor shall start up (put into operation) every piece of equipment, control/safety device and system and demonstrate to the Designer and Owner's Representative that same will operate safely, noiselessly, as per code, as specified and as required by Designer whichever is the more stringent requirement.
- E. Related Requirements: 01 77 00 – Closeout Procedures.

1.02 RELATED WORK SPECIFIED/INDICATED ELSEWHERE

- A. Equipment, control/safety devices and systems, including, but not limited to, the following:
 - 1. Mechanical
 - 2. Plumbing
 - 3. Electrical
 - 4. Fire Protection
 - 5. Fire Alarm

1.03 PROCEDURES

- A. Mechanical and Electrical: Contractor shall provide a detailed checklist and procedures for cleaning, inspecting and adjusting each piece of equipment, control/safety devices, system, etc. All to be in accord with the manufacturer's specific recommendations and as required to prepare each item for proper operation, including, but not limited to, the following items and systems:
 - 1. HVAC Systems:
 - a. Exhaust (air)
 - b. Make up air
 - c. Combustion air
 - d. Air handling H/C
 - e. Control
 - 2. Mechanical Equipment, Control/Safety Devices
 - a. Air Handling Units
 - b. Fans and blowers
 - c. Fan coil units
 - d. Coils

- e. Valves - gate, globe, plug, balancing, etc.
 - f. Filters
 - g. Safety and pressure reducing valves
 - h. Gauges and thermometers
 - i. Thermostats and controls
 - j. Sound and vibration attenuation
 - k. Dampers and operators
 - 3. Plumbing Systems
 - a. Domestic cold water
 - b. Domestic hot water
 - c. Sanitary sewer
 - d. Storm sewer
 - e. Fire Extinguishing
 - 4. Plumbing equipment, controls/safety devices
 - a. Water heaters
 - b. Storage tanks
 - c. Valves - gate, globe, plug, balancing, etc.
 - d. Safety & pressure reducing valves
 - e. Gauges and thermometers
 - f. Thermostats and controls
 - g. Sound & vibration attenuation
 - h. Circulating pumps
 - i. House pumps
 - j. Meters (water and gas)
 - k. Vacuum breakers
 - l. Backflow preventers
 - m. Fixtures and trim
 - 5. Electrical Systems
 - a. Emergency lighting
 - b. Grounding
 - c. Power Distribution
 - d. Lighting circuitry
 - e. Equipment - power & control
 - f. Fire alarm
 - g. Smoke detection
 - h. Light dimming
 - i. Exit lighting
 - 6. Electrical equipment, controls/safety devices
 - a. Motor control center
 - b. Panels - light, power, control, annunciation
 - c. Transformers
 - d. Disconnects
 - e. Breakers
 - f. Fuses
 - g. Switches
 - h. Fixtures & Lamps
 - i. Starters
 - j. Clocks/timers
 - k. Relays
 - l. Solenoids
 - m. Arrestors - surge
 - n. Thermostats
 - o. Bells/horns/buzzers/sirens
- B. Start-up and check-out of miscellaneous equipment.
- 1. Equipment manufacturer's representative to visit site, when notified by Designer that

- specific equipment is ready for start-up and check-out.
2. Designer, Owner's Representative, equipment manufacturer's representative, representatives of Contractor and Subcontractor responsible for hook-up, equipment design engineer and representative of operations staff are to be present during start-up and must sign acceptance of each piece of equipment after check-out.
 3. Any deficiencies found must be reported in writing to the Designer and corrected before final check-out and acceptance, again following the above procedure.
 4. To minimize site visits, it is preferable to have as many pieces of equipment ready together, with the required representatives available.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Employ cleaning materials that have been recommended or produced by the manufacturer of the item or component being cleaned and have been approved by the Architect.
- B. Employ disinfecting agents that have been approved by the EPA and any other authorities having jurisdiction.
- C. Employ lubricants that have been recommended or produced by the manufacturer of the item or component being lubricated and have been approved by the Architect.

2.02 CLEANING MATERIAL SHALL BE

- A. Specifically recommended by manufacturer for the service intended.
- B. Approved by the manufacturers of the equipment, item and system being cleaned.
- C. Approved by governing agencies.
- D. Approved by Designer.

2.03 DISINFECTING AGENTS

- A. For potable water system shall be:
 1. Specifically recommended by manufacturer for the service intended.
 2. Approved by the manufacturers of the equipment, item and system to be disinfected.
 3. Approved by governing agencies.
 4. Approved by Owner and Designer.

2.04 LUBRICANTS AND OTHER MATERIALS

- A. Lubricants and other materials necessary during checking, adjusting or servicing of each piece of equipment, control/safety device on system in preparation for putting it into operation shall be:
 1. Specifically recommended by manufacturer for the service intended.
 2. Approved by the manufacturer of the equipment, item or system part being checked, adjusted or serviced.
 3. Approved by governing agencies.
 4. Approved by Owner and Designer.

2.05 MATERIAL QUALITY

- A. All products shall be new and of top quality. Delivered to job site in unopened clearly labeled containers giving storage and handling recommendations, expiration dates and instructions for safe use.

PART 3 - EXECUTION

3.01 STARTING OF SYSTEMS

- A. Personnel performing services pursuant to this section shall be fully trained and experienced tradesmen highly skilled in the work being performed and, where necessary or required, be factory trained and approved.
- B. Contractor shall provide all required or necessary safety equipment, warning signs, barricades, etc. so that all cleaning, disinfecting and adjusting operations will be completed without injury to personnel, equipment, property, etc.
- C. All cleaning of equipment, control/safety devices and systems shall be performed using approved top quality trade procedures, repeated if necessary, until every piece of equipment, control/safety device and system is clean and ready for operation is required and approved by manufacturer, governing agency and Designer.
- D. All adjusting and servicing of equipment, control/safety devices and systems shall be performed using top quality trade procedures in strict accord with manufacturer's recommendations, and governing agencies and Owner's requirements.
- E. The disinfecting of the potable cold and hot water systems shall be performed after the above specified cleaning, adjusting and servicing work has been completed and in strict accord with governing codes and agencies, manufacturer's recommendations and Owner's requirements. Contractor shall provide an approved laboratory's test showing test results. Disinfecting and laboratory report shows findings acceptable to governing agencies and Designer.
- F. Testing, adjusting and balancing of HVAC systems specified elsewhere shall be performed immediately after the applicable work specified above has been completed and approved.
- G. Contractor shall attest in writing and demonstrate to Designer that every piece of equipment, control/safety device, and system is clean, ready for operation and approved for operation by governing agencies.
- H. Contractor shall demonstrate to Designer and Owner's Representative by starting up and/or causing to function, that every piece of equipment, control/safety device and system will perform its intended function safely, noiselessly, per governing codes and as required by Designer. This work shall be performed by highly skilled tradesmen under direct supervision of manufacturer's factory trained and approved representatives under close surveillance of Contractor's and Owner's consultants.

END OF SECTION

SECTION 01 72 00

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Throughout progress of the Work, maintain an accurate record of changes in the Job Set, per Paragraph 3.01, and, upon completion of the Work, transfer the recorded changes to the Final Project Record Documents, per Paragraph 3.02.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Other requirements affecting Final Project Record Documents may appear in other sections of these Specifications.
- C. Pay Applications: Each pay application shall include a statement signed by both the Contractor and the Architect that the "Job Set" is current with any changes: such as location, material, manufacturer, etc. This covers both the drawings and the specifications.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 00.
- B. Prior to submitting each request for progress payment, secure the Architect's approval of the current status of the Job Set.
- C. Prior to submitting request for final payment, submit the Final Project Record Documents to the Architect and secure his approval.

1.03 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Job Set to one person on the Contractor's staff as approved by the Architect.
- B. Accuracy of records:
 - 1. Thoroughly coordinate changes within the Job Set, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Final Project Record Documents.
 - 3. Make entries within 24 hours after receipt of information that the change has occurred.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Maintain the Job Set completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the Final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.

1. Such means shall include, if necessary, in the opinion of the Architect, removal and replacement of concealing materials.
2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.01 RECORD DOCUMENTS – AS-BUILT DRAWINGS AND PROJECT MANUAL

- A. Job Set: Promptly following receipt of the Owner's Notice to Proceed, secure one complete set of all Documents comprising the Contract. Place in Field Office.
- B. Final Project Record Documents: At a time nearing the completion of the Work, PREPARE AND PROVIDE ONE ELECTRONIC DWG CAD FILES ON CD of all drawings and specifications and two hard copies of the drawings and specifications. The electronic copy shall be as follows:
 1. Electronic copy of project "specifications" in Microsoft Word 2010.
 2. One hard-copy set of "Construction" and "As-Built" drawings with "Final" Architect/ Engineer Seals.
 3. Hard copies of all "field" changes made by individual trades, especially Electrical, Plumbing and Mechanical.
 4. Electronic copies of "Construction" and "As-Built" drawings on CD's shall include the following in AutoCAD Release 2013 or greater.
 - a. All xref's; Do not bind xref's.
 - b. All plot files. May bind.
 - c. No junk files.
 - d. Each "Division" to be in separate folders, i.e., Architectural, Civil, etc.
 - e. Each Division folder and Sheet to be named accordingly, i.e. "A3.01", including "Drawing Dates".
 - f. All tif.'s and pdf.'s to have appropriate professional "Seal".
 - g. Label each Disc with: Location Name, Project Name, Date, and number of disc, i.e., 1 of 3, etc.
 - h. All xref.'s shall be loaded and attached to each drawing so that each drawing is viewable, when opened.
 - i. As-Built Drawings with Auto CAD DWG (NOT PDF-NOT SCANNED) of Same As-Built Drawings
 - j. As-Built Drawings are to be Submitted with a Cover List of Each Specific Change – Sequential Numbering of Each Change - Corresponding Drawing Sheet Number where Change Occurred, Etc. and Including All As-Built Section Requirements Within this Project Manual.

PART 3 - EXECUTION

3.01 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the Job Set described in Paragraph 2.01, A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".
- B. Preservation:
 1. Considering the Contract completion time, the probable number of occasions upon which the Job Set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the Job Set to the approval of the Architect.
 2. Do not use the Job Set for any purpose except entry of new data and for review by the

- Architect, until start of transfer of data to Final Project Record Documents.
3. Maintain the Job Set at the Site Office.
- C. Making entries on Job Set:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required. This is for drawings and specifications.
 2. Date all entries.
 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
 4. In the event of overlapping changes, use different colors for the overlapping changes.
 5. Make entries in the pertinent other Documents as-approved by the Architect.
 6. Mark-up new information which is recognized to be of importance to the Owner but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date.
 7. Note related change order numbers where applicable.
 8. Markings shall be legible.
- D. Conversion of schematic layouts:
1. In some cases, on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
 2. Final physical arrangement is determined by the Contractor, subject to the Architect's approval.
 3. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
- E. Show on the Job Set, by dimension accurate to within one half inch.
1. Clearly identify the item by accurate note such as "cast iron drain," or "gale Water," and the like.
 2. Show, by symbol or note, the vertical location of the item ("under slab," "in ceiling plenum," "exposed," and the like).
 3. Make all identification so descriptive that it may be related reliably to the Specifications.
- F. Give particular attention to substitutions, selection of options, and similar information on work where is it concealed or otherwise cannot be discerned readily at a later date by direct observation. Note related record drawing information and product, where applicable.
- ### 3.02 FINAL PROJECT RECORD DOCUMENTS
- A. The purpose of the Final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation and examination.
- B. Approval of recorded data prior to transfer:
1. Following receipt of the electronic copy of the contract drawings and specifications and prior to start of transfer of recorded data thereto, secure the Architect's approval of all recorded data.
 2. Make required revisions.
- C. Transfer of data to Drawings:
1. Carefully transfer change data shown on the Job Set to AUTOCAD Release 2013 or Greater DWG FILES ON CD, coordinating the changes as required.
 2. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction and the actual location of items described in subparagraph 3.01 above.
 3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
 4. Make changes neatly and consistently to assure clear plotting.

- D. Transfer of data to Specifications: Make changes on MICROSOFT WORD 2010 of all sections. Show changes in bold with followed by the letters "FPRD" in parenthesis (for Final Project Record Documents). In the Table of Contents put the same letters (in bold) beside any section so changed.
- E. Review and submittal:
1. Submit the completed set of Final Project Record Documents to the Architect.
 2. Participate in review meetings as required.
 3. Make required changes and promptly deliver the Final Project Record Documents to the Architect.
 4. As-Built Drawings with Auto CAD DWG (NOT PDF-NOT SCANNED) of Same As-Built Drawings
 5. As-Built Drawings are to be Submitted with a Cover List of Each Specific Change – Sequential Numbering of Each Change - Corresponding Drawing Sheet Number where Change Occurred, Etc. and Including All As-Built Section Requirements Within this Project Manual.

3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work after Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

SECTION 01 73 00

OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.01 NOT USED

PART 2 - PRODUCTS

2.01 INSTRUCTION MANUALS

- A. To aid the continued instruction of operating and maintenance personnel and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in other pertinent Sections of this Project Manual.
- B. Format.
 - 1. Size: 8-112" x 11"
 - 2. Paper: White bond, at least 20-pound weight
 - 3. Text: Typewritten
 - 4. Drawings:
 - a. Bind in with the text.
 - b. Fold-out drawings are acceptable.
 - c. Fold drawings larger than 8-1/2" x 14" and fit into a drawing pocket inside the rear cover of the manual.
 - 5. Flysheets:
 - a. Separate each section of the manual with a flysheet that briefly describes the contents of the section.
 - b. Flysheets may be in color.
 - 6. Binding:
 - a. Provide heavy plastic or fiberboard covers with binding mechanisms concealed.
 - b. Three (3) ring binders are acceptable.
 - 7. Measurements:
 - a. Indicate all measurements in standard US units such as feet and inches, pounds, and cubic feet per minute and so forth.
 - b. Where items may be expected to be measured within ten (10) years in accordance with the metric formulae, provide additional measurements in the International.
 - 8. Provide front and back covers for each manual, using durable material approved by the Architect and clearly identified on or through the cover with at least the following information:
 - a. OPERATING AND MAINTENANCE INSTRUCTIONS
 - b. Name and address of Work.
 - c. Name of contractor.
 - d. General subject of this Manual.
 - e. Space for approval signature of the Architect and approval date.
- C. Contents:
 - 1. Typewritten index.
 - 2. Complete instructions regarding operation and maintenance of all materials involved, including:
 - a. Removal and re-installation of existing adjacent materials that are in good and/or acceptable condition as deemed good and/or acceptable by Architect or Owner
 - b. Removal of existing adjacent materials and replacement of new adjacent materials which match removed adjacent materials which are acceptable as

- deemed acceptable by Architect or Owner.
- c. Normal operating procedures or sequences and any special procedures required during seasonal changes.
- d. Complete explanation of all materials specifications, applications, warranties, etc.
- e. Normal maintenance cleaning and repair procedures requirements.
- f. Predicted service life of all materials subject to wear by normal seasonal conditions.
- g. Recommendation regarding use of graffiti removal chemicals, as well as what not to use regarding graffiti removal chemicals.
- 3. Complete nomenclature for all materials and equipment.
- 4. Manufacturer's bulletins, cuts, and descriptive data where pertinent, clearly indicating the precise items included in this installation and deleting or otherwise clearly indicating all manufacturer's data with which this installation is not concerned.
- 5. Such other data as required in pertinent Sections of these specifications.
- 6. Warranties, bonds or service agreements issued covering the materials which indicate:
 - a. Material or product covered.
 - b. Date the pertinent agreement started and the date the agreement will end.
 - c. Owner maintenance required to maintain warranty, bond or service repair agreement.
 - d. Instances which will void or otherwise affect the warranty, bond or service repair agreement.

PART 3 - EXECUTION

3.01 INSTRUCTION MANUALS

- A. Preliminary:
 - 1. Prepare a preliminary draft of each proposed Manual.
 - 2. Show general arrangement, nature of contents in each portion, probable number of drawings showing the areas of work performed per the Scope of Work and their size and proposed method of binding and covering.
 - 3. Obtain the Architect's approval prior to proceeding.
- B. Final:
 - 1. Comply with the pertinent provisions of Section 01 77 00.
 - 2. Complete the manuals in strict accordance with the Architect's comments and information.
 - 3. Provide three (3) copies.
- C. Revisions:
 - 1. Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Project Manual with the Architect.
 - 2. If the Contractor is required, by the Architect to make substantial revisions to the previously approved Project Manual, additional compensation will be considered in accordance with the General Conditions of the Contract for Construction.

3.02 OWNER INSTRUCTION

- A. After approval of the Maintenance Manuals but prior to Final Payment, provide a trained and experienced representative of the company contracted to provide cleaning services or work in the proper operation and maintenance of cleaning and/or repairing in-place or installed work, to identify and confirm on-site and per as-built drawings completion of all work by contract.
- B. Provide the representative/s for not less than one (2) full workdays for-proper instruction.

- C. If required due to the complexity of operation or maintenance or by stipulations of warranty, provide a representative/s for each pertinent manufacturer to assist in the instruction and to answer questions and to explain how maintenance can affect or void warranty.
- D. Provide a list of all company personnel dedicated to the contracted work for the duration of the work through the completion of the work with same personnel telephone numbers, cell phone numbers, respective fax numbers (if applicable) and any other information necessary to contact same personnel during and after completion (as deemed completed by the Architect) of contracted work.

END OF SECTION

SECTION 01 73 20

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.2 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 Owner.
- 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.

1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- B. Pre-demolition Digital Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

- D. Standards: Comply with ANSI A10.6 and NFPA 241.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Owner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner. Owner will remove hazardous materials under a separate contract.
- 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 in service during selective demolition operations.

1.6 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 Architect.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

- F. Survey of Existing Conditions: Record existing conditions by use of **preconstruction digital photographs**. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

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.
- 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 in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

- A. Site Access: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- 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.

3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. 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.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. 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.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly.

- B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Owner or Architect's approval.
- C. Removed and Salvaged Items:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area as designated by Owner.
 5. Protect items from damage during transport and storage.
- D. 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.
- E. 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.

3.5 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.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 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 01 73 20

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

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

1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.03 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - 2. Indicate dates when cutting and patching is to be performed.
 - 3. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

1.04 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ration.
- B. Obtain approval before cutting and patching the following structural elements:
 - 1. Bearing and retaining walls.
 - 2. Structural steel.
- C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
 - 1. Obtain approval before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Fire protection systems.
 - c. Communication systems.
 - d. Electrical wiring systems.
- D. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetics qualities, or result in visually unsatisfactory manner.

1.05 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

2.01 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Before cutting existing surfaces examine surfaces to be cut and patched and conditions under which cutting and patching is 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

3.02 PREPARATION

- A. Temporary Support: Provide adequate temporary support of Work to be cut.
- B. Protection: Fully protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portion of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.03 PERFORMANCE

- A. General: Employ skilled workmen 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 existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
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 2 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. Retain subparagraph below if required to prevent multiple cutting and patching in the same area. Add specific requirements for multiple contracts and special conditions requiring coordination.
 7. 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.
 3. **Floors and Walls:** Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 4. **Ceilings:** Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. **Exterior Building Enclosure:** Patch components in a manner that restores enclosure to a weather-tight condition.

3.04 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Execution of daily cleaning during progress of the Work and at completion of the Work. If the Contractor fails to keep the project clean, as herein specified, the Owner shall do the cleaning, the costs of which shall be charged to the Contractor.

1.02 DISPOSAL REQUIREMENTS

- A. Conduct daily cleaning and disposal operations to comply with codes, ordinances, regulations and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only cleaning methods and materials recommended by the manufacturers of the surface to be cleaned.
- C. Use only cleaning materials only on surfaces recommended by cleaning material manufacturer.
- D. Refer to particular sections of this Project Manual for items requiring special handling and cleaning.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING

- A. General:
 - 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding traffic and providing the required protection of materials.
 - 2. Do not allow the accumulation of scrap, debris, waste material and other items not required for the construction of the Work.
 - 3. Twice weekly, and more often if necessary, the Contractor shall completely remove all scrap, debris and waste material from the jobsite and shall place in container furnished by the Contractor.
 - 4. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection.
- B. Project Site; The Contractor shall:
 - 1. Daily, and more often if necessary, inspect the project site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, sweep all interior places clean. "Clean", for the purpose of the subparagraph, shall be interpreted as meaning free from dust and

other material capable of being removed by reasonable diligence using a hand-held broom.

3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, protect by covering with temporary coverings and/ or clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in finish materials have been installed. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material, which may injurious finish floor material.

3.02 FINAL CLEANING

- A. Definition: Except as otherwise specifically provided, "Clean" (for the purpose of this Section) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance Subcontractors using commercial quality building maintenance equipment and materials.
- B. General: Prior to completion of the Work, remove from the job all tools, temporary structures, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning materials and equipment.
- C. Interior: Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains and dirt from finish surfaces. Use only the specified cleaning materials and equipment.
- D. Repair, patch and touch-up marred or damaged surfaces to match adjacent finishes.
- E. Clean the following if located within the project area:
 1. Plumbing fixtures, Strainers and Floor Drains.
 2. Light Fixtures and Lamps.
 3. Replace filters of ventilating equipment when units have been operating during construction. In addition, clean grilles and louvers.
 4. Excess lubrication is to be removed from mechanical and electrical equipment.
 5. All Electrical Panels.
- F. Clean all transparent materials, including glass and mirrors. Remove glazing compound and other substances that are noticeable from vision-obscuring materials.
- G. Remove labels that are not permanent labels.
- H. Polished and Resilient Surfaces: To all surfaces requiring the routine application of protective waxes and/ or buffed polish, apply the specified coating and/ or polish as recommended by the manufacturer of the material being treated, as specified in individual Specification Sections.
- I. Leave concrete floors broom clean. Vacuum carpeted surfaces.
- J. Clean areas traversed by construction personnel.
- K. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean. Remove stains, spills and other foreign deposits.

- L. Wash walk steps, terraces, curbs, drives and paved areas free of mud or other foreign stains.
- M. Clean finish surfaces and site improvements of dirt, stains and foreign matter.
- N. Clean storm drainage systems to provide for free flow of storm water.
- O. Roof:
 - 1. Remove all construction debris from each roof.
 - 2. Verify that all roof drains, gutters and downspouts are clear and will provide free flow of storm water.
 - 3. Remove leaves and other foreign matter from the surface of each roof.
- P. Maintain cleaning until the building, or portion there, is accepted by the Owner.
- Q. Timing: Schedule final cleaning as to enable the Owner to accept a completely clean project.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. See Division 1 and Agreement Between Owner and Contractor for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Divisions 2 through 48 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.02 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following and list items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 7. Complete startup testing of systems.
 - 8. Submit test/adjust/balance records.
 - 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 10. Advise Owner of changeover in heating/cooling and other utilities.
 - 11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 12. Complete final cleaning requirements, including touchup painting.
 - 13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will approve the Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner, that must be completed or corrected before approval will be given.

1. Re-inspection: Request re-inspection 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.

1.03 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 3. Completion shall be subject to a final inspection by the owner's representative.
 4. Copies or proof of final inspection approvals by the authorities having jurisdiction shall be delivered to the owner's representative.
 5. The Contractor shall provide a written guarantee that all products, materials and workmanship will be free from inherent defects for a period of one year from the date of acceptance by the Owner. This written guarantee shall be made on the Contractor's letterhead. Defects arising during this period shall be promptly corrected by the Contractor, at his own expense, upon notice from the Owner. This guarantee shall include all materials and labor. The Contractor shall describe the project as titled in these documents, including the contract's purchase order number and stating the specific warranty date(s) in the body of this guarantee statement.
 6. The Contractor shall supply a written statement, on company letterhead, to the owner, stating that no asbestos-containing building materials were used in this work. The Contractor shall describe the project as titled in these documents, including the contract's purchase order number in the body of this statement.
 7. All items on the Owner's punch list shall be addressed and completed.
 8. **NOTE: Final payment will not be approved until all of the above requirements are completed.**
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner 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. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Contractor's Punch List shall be submitted to Owner on the Contractor's letterhead.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties to Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- 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, 3-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.
- C. Provide Owner with three copies of each warranty, including Operation and Maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for approval of Substantial Completion for entire Project or for a 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. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Sweep concrete floors broom clean in unoccupied spaces.

- g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- i. Remove labels that are not permanent.
- j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
- k. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.
- l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- p. Leave Project clean and ready for occupancy.

END OF SECTION 01 77 00

SECTION 02 40 00

EXISTING CONDITIONS & DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and procedures needed during demolition of non-asbestos containing materials and parts of existing buildings and site conditions.

1.02 QUALITY ASSURANCE

- A. Coordinate demolition and cutting times to cause minimum disruption to Owners continuing operations within the building. Schedule any Mechanical and Electrical shut down at least 7 days in advance. Notify Owner at least 24 hours in advance of the start of any work which will produce excessive noise, vibration, dust, power outage, HVAC shutdown, plumbing shutdown, etc.
- B. Conform to all local, state and national codes and ordinances including OSHA and EPA. Secure necessary permits and approvals. Post signs and erect barricades to fully protect all persons on and around the project. Where hazardous substances are encountered or suspected, refer to OSHA and EPA regulations for proper procedures.
- C. Maintain all active mechanical, communication and electrical services which pass through or across project area. Restore all services which are cut off by demolition. Should a question exist regarding the function of any lines, request direction prior to demolition. Upon completion of project all services throughout the building to be operational.
- D. Remove trash from building by way of a temporary chute to control dust and blowing trash. Dump trash directly into truck bed or commercial type waste removal container. Provide cover over truck bed or around waste container opening to control dust. Dispose of trash in accordance with local ordinances. Do not allow excessive trash to accumulate on the building and site or in such a way as to overload the structural system.
- E. Provide ground protection for all dumpsters, job trailers, storage containers and construction materials. Construct in a manner to protect all sodded areas, plazas and walkways. These items shall not be allowed near Landscaped and irrigated areas. The Contractor shall repair any damage to these areas which may result from the installation or removal of these temporary items.
- F. Erect covered walkways, barrier fences, guard rails, and shoring to protect pedestrians, personnel, occupants, structures and utilities that are to remain intact and in operation on a day-to-day basis during demolition and construction operations.
- G. Construct dust curtains, covers and walls to contain contaminants generated from demolition operations. Construct in a manner to protect all existing equipment and permit full use and occupancy of unaltered spaces and areas.
- H. Erect temporary canopies and covers over unfinished work areas to prevent rain/ wind/ weather damage to building interiors or uncompleted site work. Contractor is to repair all damage to building or site which may result from the areas not being properly covered or protected. Contractor shall be mindful that the cover may need to stay in place for several days

- I. Contractor shall only tear off roofing and materials that can be replaced during the daily working hours. Contractor is responsible for checking all weather reports and conditions. In the event that unforeseen conditions arise with the construction or weather conditions, the Contractor shall have on-site materials to erect temporary canopies, covers and roofs to prevent water or rain damage to the building interiors. The Contractor shall repair any damage which may result from their temporary covering not being watertight.
- J. Ensure minimum interference with road, streets, driveways, sidewalks and adjacent facilities. Do not close or obstruct streets, walks or other facilities without written permission from authorities having jurisdiction.
- K. At completion of project repair all damage to site and site improvements. Repair damage to curbs, walks, asphalt and concrete parking/ drives, landscaping, irrigation lines, sprinkler heads, existing structures, outdoor furniture, and vehicles. Sod all bare earth.
- L. Coordinate all demolition with requirements specified in structural, plumbing, mechanical & electrical Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide Barricades and Signage in accordance with Temporary Construction Facilities Section 01 50 00.
- B. Provide construction chutes, as needed, from sturdy materials. They should be properly braced and extend from the dumping point to slightly above truck or container rail, to control dust and trash during removal from the site.
- C. Provide adequate dust screens to protect existing spaces utilizing heavy plastic sheeting and wood framing. Tape joints and edges to make dust tight.
- D. Where existing materials to remain are damaged during demolition, repair damage utilizing materials equal to original material in new condition.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Survey existing conditions and correlate with drawings and specifications to determine extent of demolition required.
- B. In so far as is practical, arrange operations to reveal unknown or concealed conditions for examination and verification before removal or demolition.
- C. Verify actual conditions to determine in advance whether removal or demolition of any element will result in failure or unplanned collapse.
- D. Perform continuing surveys as the work progresses to detect hazards resulting from demolition or construction activities.

3.02 INSTALLATION

- A. Demolish and dispose of all materials and equipment as indicated on the drawings.
- B. Use proper trades for decommissioning existing services. Do not remove active services which pass through or over the project area. Reroute these services where necessary, utilizing appropriate materials.
- C. Patch around openings to match existing. Where demolition exposes holes in walls, floors, ceilings, roofs, etc., that are to remain, close opening with material to match existing. Provide structural members, reinforcing, etc. necessary to close the opening and maintain structural integrity as approved by the Architect or Engineer.
- D. Where services and equipment must pass through roofs, walls or other floors, do minimum demolition. When cutting structural slabs, make holes minimum in size. Take extreme care to avoid fires when utilizing cutting torches. Re-grout and seal all holes after services and equipment are installed.
- E. All salvageable materials become the property of the Contractor, unless otherwise indicated. Where existing materials are indicated to be salvaged for reuse, use extreme care in their removal and storage. Carefully cull and clean materials prior to reuse.

3.03 CLEANUP

- A. Upon completion of the demolition work, all removed materials shall be either relocated to their proper storage facility, sent to proper salvage yards, or placed in proper trash containers, leaving the project area neat, clean, straight and ready for the install of new construction.

END OF SECTION

SECTION 05 31 00

STEEL DECK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work in this Section include all steel decking and roof decking.

1.02 RELATED SECTIONS

- A. Section 01 22 00 – Unit Prices
- B. Section 07 53 23 – Single-Ply Roofing

1.03 SUBMITTALS

- A. Refer to Section 01 33 00 – Submittals, for submittal procedures.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of decking, accessory, and product.
- C. Shop Drawings Include:
 - 1. Deck layout and orientation, supporting steel framing and supports with dimensions and section details.
 - 2. Deck type and profile, dimensions, supports, projections, openings and reinforcement.
 - 3. Welds and mechanical fastener types, sizes and patterns.
 - 4. Side lap connector types, sizes and patterns.
 - 5. Accessory details.
- D. Welder certificates.
- E. Field quality-control test and inspection reports.

1.04 QUALITY ASSURANCE

- A. Quality Standards: Fabricate and erect steel decking and accessories in accordance with SDI recommendations.
- B. General: Manufacturer Qualifications: Deck manufacturer is member producer of SDI.
- C. Testing Agency Qualifications: An independent agency qualified according to ASTM E329 for testing indicated.
- D. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- E. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- F. AISI Specifications: Comply with calculated structural characteristics of steel deck

according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of Steel Deck Institute – "Manual of Construction with Steel Deck" (SDI – MOC2).
- B. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.01 ROOF DECK

- A. Fabricate panels to match existing decking and to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:
 - 1. Sheet Steel for Galvanized Roof Deck and Accessories: ASTM A653 Structural Quality, Grade 33 minimum. Galvanizing: ASTM A924 G60 zinc coating.
 - 2. Deck Profile:
 - a. Narrow rib (Type A).
 - b. Wide Rib (Type B).
 - c. Intermediate rib (Type F).
 - 3. Profile Depth: 1 ½".
 - 4. Design Uncoated Steel Thickness:
 - a. 22 gage.
 - 5. Section Modulus: S = 0.186.
 - 6. Side Laps: Overlapping or nestable.
- B. Where fire resistance rated assemblies are required, provide UL-listed units. Identify steel deck bundles with labels bearing the UL Mark and UL Design Number as indicated on the drawings.
- C. Provide acoustical deck where identified on plans.

2.02 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Welds:
 - 1. Material: Electric shielded arc process using minimum E70XX electrodes in accordance with AWS D1.3 procedures.
 - 2. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter. Use on steel deck thinner than 22 gage.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws.
- D. Power-actuated Fasteners: Corrosion-resistant, low-velocity, power-actuated, carbon-steel screws.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 20 gage design uncoated thickness, of same material and finish

as deck; of profile indicated or required for application.

- F. Pour Stops and Girder Fillers: Galvanized G-60 minimum steel sheet, minimum yield strength of 33,000 psi, of thickness and profile as indicated.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Unless otherwise indicated, galvanized G-60 minimum steel sheet of same thickness as deck, but no less than 20 gage.
- H. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.
- I. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.
- J. Rust Treatment: 3-part component bonding agent and anti-corrosion coating.
 - 1. Duralprep A.C. by Euclid Chemical.
 - 2. Armatec-110 by Sika.

PART 3 - EXECUTION

3.01 INSTALLERS

- A. Qualifications:
 - 1. All steel deck welders AWS certified for welding of sheet steel.
 - 2. All power-actuated fastener installers certified or licensed by the fastener and tool system manufacturer on the project site in accordance with ANSI A10.3 requirements. Certification or licensing includes all training necessary for proper tool operations, fastener selection, maintenance and troubleshooting.
- B. Compliance:
 - 1. For power-actuated fastener installation, comply with all manufacturer catalog and carton installation instructions, product data and technical bulletins.

3.02 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.03 GENERAL INSTALLATION

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Power-actuated fasteners may be used in lieu of welding to fasten deck. Locate power-actuated fasteners and install according to deck manufacturer's written instructions.

3.04 ROOF DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.
 - 2. Weld Spacing: Weld perimeter edges and interior ribs of deck units to supporting steel framing at Space and locate welds as indicated.
- B. Fasten roof deck panels to steel supporting members with power-actuated fasteners at spacing and pattern as indicated.
- C. Side-Lap Fastening: Fasten side laps of panels between supports with No. 10 diameter screws at 12" on center maximum spacing or as indicated.
- D. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches with end joints lapped 2 inches minimum or butted.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.

3.05 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Engage a qualified independent testing and inspecting agency to perform field tests and inspections.
- B. Inspections:
 - 1. Inspect deck welds in accordance with AWS D1.3. Visually inspect deck side lap fastenings for size and spacing. Ensure deck is clamped to supporting steel framing.
 - 2. Special Inspections for Deck Welds: Comply with the Statement of Special Inspections as indicated.
- C. Correct deficiencies in Work that inspections indicate are not in conformance to specified requirements.
- D. Additional inspection, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.06 REPAIRS AND PROTECTION

- A. Welds: Repair all portions of the steel deck coating damaged due to weld heat with compatible paint type or zinc rich compound.

- B. Rusted Deck:
 - 1. Replace all existing metal deck that is no longer structurally sound and that does not meet pull test requirements to meet substrate requirements for Roofing Manufacturer's warranty.
 - 2. When rusted deck is found that still meets pull test requirements, treat it prior to the installation of other materials.
 - a. The surface must be structurally sound, clean and free of grease, oil, dust and other contaminants. All contamination should be removed and the surface prepped to a "near white" finish using clean, dry media. Area should be fully exposed and all corrosion removed.
 - b. Apply coating(s) per manufacturer's instructions to achieve proper coating, mils and dryness.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes, but is not limited to the following:
 - 1. All miscellaneous metals indicated or required to complete the work and not specified in other Sections.
 - 2. Supplementary structural steel incorporated in the project and shown on the Drawings.
 - 3. Miscellaneous metal items which are fully described on the drawings and not necessarily named herein but shall be provided as shown and subject to applicable requirements of this Section.
 - 4. Miscellaneous support and clip angles, including deck and joist support and clip angles.
 - 5. Metal frames for framed openings.
 - 6. Roof access ladders.
 - 7. Handrails and railings.
 - 8. Sleeves as required for the passage of utilities through the structure and as required.
 - 9. Trench Covers and Grates.
 - 10. Other items as required to complete the Work.

1.02 RELATED SECTIONS

- A. Section 05 31 00 - Steel Decking: Metal fabrications required for the roof deck installation. Metal frames for openings installed in conjunction with the roof deck.
- B. Section 09 91 00 - Painting: Painting of exposed metal fabrications.

1.03 QUALITY ASSURANCE

- A. Materials shall be free from defects impairing strength, durability, or appearance, of best commercial quality for purposes specified. Exposed surfaces throughout the building shall have the same inherent texture and color for like location. Fastenings shall, insofar as practicable, be non-corrosive, non-staining, and concealed. Fastenings which must be exposed shall be of the same material, color and finish as material to which applied, shall be countersunk and finish flush. Exposed welds shall be ground smooth to form a neat uniform fillet without weakening base metal. Molded, bent or shaped members shall be formed with clean sharp arises, without dents, scratches, cracks or other defects. Provide all anchors, bolts, shims, and accessory items required for building into fastening to adjacent work.

1.04 SUBMITTALS

- A. Copies of shop drawings and complete installation data shall be furnished to the Architect on all items specified in this Section. Submit shop drawings in accordance with Section 01 33 00 - Submittals, prior to any fabrication.

1.05 FIELD MEASUREMENTS

- A. Take all necessary field measurements to verify or supplement dimensions shown on the drawings. Furnish templates as required or directed. The Contractor shall be

responsible for furnishing all necessary instructions for the setting of anchors, bearing plates and miscellaneous items and he shall ascertain that all materials are properly set during the progress of work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Structural steel shapes, plates, and bars shall meet ASTM A 992/A 572-50.
- B. Hollow structural tubing shall meet ASTM A 500, Grade B (yield strength 46,000 PSI).
- C. Steel pipe shall meet ASTM A 501 or ASTM A 53 for standard weight (Schedule 40) pipe.
- D. Steel tubing and Miscellaneous Steel: ASTM A 36.
- E. Structural steel angles for miscellaneous bracing, reinforcement, etc., shall be provided as indicated on drawings. Steel clip angles shall conform to ASTM A 36. Steel angles exposed to weather or built into exterior walls shall be hot-dipped galvanized.
- F. Steel Railings: Configuration as detailed on drawings. Fabricate railings using steel shapes, plates and hollow steel tubing complying with ASTM A 7. Railings shall have a rust inhibiting primer applied after fabrication.
 - 1. Steel handrails and guards shall be designed to resist a linear load of 50 pounds per linear foot in accordance with Section 4.5.1 of ASCE 7.
 - 2. Steel handrails and guards shall be designed to resist a concentrated load of 200 pounds in accordance with Section 4.5.1 of ASCE 7.
 - 3. Steel intermediate rails shall be designed to resist a concentrated load of 50 pounds in accordance with Section 4.5.1 of ASCE 7.
- G. Pipe Sleeves: All metal posts and pipes set in concrete shall be inserted into pipe sleeve. Sleeves shall be length as required by 1-1/2 inches larger than the item they are to receive and the same shape (round, square or rectangle) as the conduit. Fabricate sleeves from 18 gauge steel; provide two hairpin anchors per sleeve. All joints and connections shall be full welded, and the entire sleeve assembly will be hot-dipped galvanized after fabrication. Steel sleeves exposed to weather and built into concrete shall be hot-dipped galvanized.
- H. Primer used to touch up galvanized surfaces shall be manufacturer's standard or ZRC Cold Galvanizing Compound as manufactured by ZRC Chemical Products Company of Quincy, Massachusetts or equal.
- I. Frames for Roof Openings and Supports: Fabricate all miscellaneous roof frames to sizes shown on the drawings.
- J. Provide and install all other metal items, required to complete the Work, not specifically mentioned herein or specified in other divisions.
- K. Rough Hardware: Furnish custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing and supporting and anchoring woodwork.

PART 3 - EXECUTION

3.01 FABRICATION AND INSTALLATION

A. General:

1. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
2. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, flathead (countersunk) screws or bolts. Fasteners for exterior work shall be stainless steel. All other fasteners shall be compatible with the material(s) being secured, anchored, etc.
3. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
4. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

B. Steel Handrails and Railings:

1. All handrails and railings shall be fabricated in the sizes and shapes shown on the drawings. Steel railings shall have all connections welded and all welds shall be ground smooth. After fabrication, all handrails and railings shall receive the specified paint finish.
2. Anchor railings (in concrete) in sleeves with "PorRok" anchoring cement as manufactured by Hallemite of Montvale, New Jersey.
3. Clean field welds, bolted connections and abraded areas and apply primer compatible with shop applied primer.

C. Sleeves: Shall be installed in proper locations prior to the placing of the concrete. Set sleeves at proper elevations, spread hairpin anchors and tie into place. Sleeves are not to be elevated with any material foreign to that used in normal concrete placement. Prior to concrete placement pack all sleeves with paper or cloth wadding. Final installation shall leave sleeves flush with top of the concrete and in true vertical position. Wadding is to remain in the sleeves until items are set into sleeves.

3.02 PAINTING AND PROTECTIVE COATING

- A. All ferrous metal, except stainless steel and galvanized surfaces, shall be properly cleaned and given one shop coat of Zinc Rich primer. Anchors that are built into masonry shall be coated with asphalt paint unless specified to be galvanized. Metal work to be encased in concrete shall be left unpainted unless specified or noted otherwise. Where hot-dip galvanized or zinc-coated metal is specified or shown, it shall not be shop-primed unless specifically required.
- B. Hot-dip galvanizing or zinc coatings applied on products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips shall comply with ASTM Specification A 123. Hot-dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM Specification A 386. Galvanized surfaces for which a coat of paint is specified shall be chemically treated to provide a bond for the paint. Except for bolts and nuts, all galvanizing shall be done after fabrication.

3.03 TOLERANCES FOR EXPOSED WORK

- A. Machine filed and shop assembled mechanical joints to fit within 1/32". Install free-standing items to 1/4" of correct position. Items enclosed or recessed in finished surfaces shall be centered in openings unless detailed otherwise. Sizes of each element of an assembly shall be correct within 1/8"; total size of an enclosed assembly shall be

correct with 1/4" (clear of opening not more than 1/8" all around); total size of a free-standing assembly shall be correct within 1/2". No part of hole shall show around screws or bolts, and no extra (unused) holes shall show on faces of item.

3.04 PROTECTION

- A. Protect miscellaneous metal items from damage until date of Substantial Completion. Damaged factory prime coats on ferrous metals shall be corrected immediately. Remove all rust before repriming. Where touch-up is required sand or steel wool prime coat to feather edge and brush out touch-up to provide a smooth finish surface ready for job painting.

3.05 CLEANING

- A. Before Date of Substantial Completion, remove all protective maskings and coverings and clean exposed surfaces of foreign matter. At the completion of this work, remove from the site all excess materials and debris. Leave entire work area in a neat workmanlike condition ready for final inspection.
- B. Clean field welds, bolted connections and abraded areas and apply cold galvanizing compound to comply with ASTM A 780, except that the paint shall be brushed on or spray applied in multiple coats until a dry film thickness of 8 mils minimum has been achieved.

END OF SECTION

SECTION 05 51 33
ALUMINUM LADDERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Aluminum Fixed Vertical Ladders.

1.02 RELATED SECTIONS

- A. Section 05120 - Structural Steel: Roof structure and opening support.
- B. Section 05550 - Metal Fabrications: Miscellaneous metal supports.
- C. Section 06100 - Rough Carpentry: Roof framing and opening support.
- D. Section 07400 - Membrane Roofing: Roof curb flashing.

1.03 REFERENCES

- A. ANSI A14.3 : Ladders - Fixed - Safety Requirements.
- B. OSHA 1910.23: Ladders.
- C. OSHA 1910.28: Duty to have fall protection and falling object protection.
- D. OSHA 1910.29: Fall protection systems and falling object protection-criteria and practices.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
- C. Shop Drawings for Ladders:
 - 1. Plan and section of ladder installation.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products until installation inside under cover. If stored outside, under a tarp or suitable cover.

1.06 WARRANTY

- A. Limited Warranty: Five years against defective material and workmanship, covering parts only, no labor or freight. Defective parts, if deemed so by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant which warrants same.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Precision Ladders, LLC, Morristown, TN
- B. Requests for substitutions will be considered in accordance with provisions of Specification.

2.02 ALUMINUM FIXED VERTICAL LADDER

- A. Aluminum Fixed Vertical Ladder and Components: Refer to drawings.
 - 1. Capacity: Unit shall support a 1,500 lb (680 kg) loading without failure.
 - 2. Performance Standard: Units designed and manufactured to meet or exceed ANSI A14.3, OSHA 1910.23, OSHA 1910.28 and OSHA 1910.29.
- B. Components:
 - 1. Ladder Stringer: extruded 6005-T5 aluminum – see drawings
 - 2. Ladder Tread: extruded 6005-T5 aluminum with deeply serrated top surface – see drawings.
 - 3. Ladder Mounting Bracket: aluminum angle – see drawings.
 - 4. Walk-Thru:
 - a. Side Rails: 42 inch (1067 mm) side rail extension for through ladder exits.
 - 5. Rest Platform:
 - a. Bar grating
 - 6. Finishes:
 - a. Powder Coated – to be selected.

2.03 FABRICATION

- A. Field verify all existing conditions prior to fabrication.
- B. Provide engineered shop drawings for review prior to fabrication.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- B. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.02 INSTALLATION

- A. Install in accordance with approved submittals.

3.03 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Rough opening framing for doors, windows, and roof openings other than manufactured treated wood assemblies.
- B. Preservative treated wood materials.
- C. Fire retardant treated wood materials, including FRT plywood roof decking.
- D. Plywood backing panels for communications and electrical room equipment mounting.
- E. Concealed wood blocking, nailers, and supports.
- F. Miscellaneous wood nailers, blocking and furring strips.

1.02 RELATED SECTIONS

- A. Section 07 41 13 – Metal Roof Panels
- B. Section 07 42 13 – Metal Walls Panels
- C. Section 07 53 23 – Single-Ply Roofing.
- D. Section 07 60 00 – Flashing and Sheet Metal
- E. Section 07 72 00 – Roof Accessories
- F. Section 07 72 33 – Roof Hatch

1.03 REFERENCES

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ASTM 153/A 153M – Standard specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011
- D. ASTM C 79/C 79M - Standard Specifications for treated Core and Nontreated Core Gypsum Sheathing Board; 2001.
- E. ASTM C 1177/C 1177M – Standard Specifications for Glass Mat Gypsum Substrate for Use as Sheathing; 2004.
- F. ASTM C 1396/C 1396M – Standard Specifications for Gypsum Board; 2004.
- G. ASTM D 2898 – Standard Test Methods for Accelerated Weathering of Fire-Resistant-

- Treated Wood for Fire Testing; 1994 (Reapproved 2004).
- H. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
 - I. AWPA C2 – Lumber Timber, Bridge Tires and Mine Tires – Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.
 - J. AWPA C9 – Plywood --Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
 - K. AWPA C20 – Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
 - L. AWPA C27 – Plywood – Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
 - M. AWPA U1 – Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2006.
 - N. PS 1 - Structural Plywood; 2007.
 - O. PS 20 – American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
 - P. SPIB (GR) – Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.
 - Q. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.
- 1.04 SUBMITTALS
- A. Refer to Section 01 33 00 – Submittals, for submittal procedures.
 - B. Product Data: Provide Technical data on sheathing system. Dimensional lumber, wood preservative materials and certification of Fire Retardant Treatment.
 - C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
 - B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Southern Pine, unless otherwise specified.
 - 2. If no species is specified, provide any species graded by the grading agency

specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER

A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

B. Sizes: Normal sizes as indicated on drawings, S4S.

C. Moisture Content: MC15.

D. Wood Cants and Blocking at Roofing: Standard Grade, fire retardant treated, exterior type.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content and any of the following species:
 - a. Mixed southern pine; SPIB
 - b. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA
 - c. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
 - d. Eastern softwoods; NELMA
 - e. Northern species; NLGA
 - f. Western woods; WCLIB or WWPA

2.03 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Stainless steel for high humidity, pressure-treated and preservative-treated wood locations, unfinished steel elsewhere.
2. Refer to IBC 2304.9.5.3 for fasteners for use in fire-retardant-treated wood in exterior, wet and damp locations.

2.04 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.

B. Fire Retardant Treatment:

1. Application: All lumber and wood sheathing used in construction of permanent or temporary facilities shall receive Fire Retardant Treatment.
2. Manufacturers:

- a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
 - b. Hoover Treated Wood Products, Inc: www.frtw.com.
 - c. Osmose, Inc: www.osmose.com.
3. Interior Type A: AWWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
- a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. All interior rough carpentry items are to be fire retardant treated.
 - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
 - d. Smoke toxicity shall be no more than that of untreated wood.
 - e. Each piece of treated wood shall bear the UL Classification Mark.
 - f. Treatment shall contain no halogens, sulfates, chlorides, or ammonium phosphate.
 - g. Reviewed by National Evaluation Service, Inc. for structural use at elevated temperatures.
 - h. Production and kiln drying after treatment monitored by Timber Products Inspection.
 - i. Qualified under the U.S. Navy Military Specification MIL-L-19140E, Type I (interior) and listed on the Qualified Producers list for MIL_L_19140E.
- C. Preservative Treatment:
- 1. Manufacturers:
 - a. Arch Wood Protection, Inc.: www.wolmanizedwood.com.
 - b. Chemical Specialists, Inc.: www.treatedwood.com.
 - c. Osmore, Inc.: www.osmore.com.
- D. Preservative Pressure Treatment of lumber Above Grade: AWWPA Use Category UC3B, Commodity Specification A (Treatment C2) using waterborne preservative to 0.25 lb./cu ft. (4.0 kg/cu m) retention.
- 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
 - 3. Treat lumber in contact with masonry or mortar.
 - 4. Treat lumber less than 18 inches (450 mm) above grade.
 - a. Treat lumber in other locations as indicated.
 - 5. Preservative Pressure Treatment of Plywood Above Grade" AWWPA Use Category UC2 and UC3B, Commodity Specification F (Treatment C9) using waterborne preservative to 0.25 lb./cu ft. (4.0 kg/cu m) retention.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing
 - c. Treat plywood in contact with masonry or mortar.
 - d. Treat plywood less than 18 inches (450 mm) above grade.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION – GENERAL

- A. Select material sizes to minimize waste.

- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

- A. Wood blocking attachment to comply with Factory Mutual Bulletin 1-49 and ANSI/SPRI ES-1 and manufacture's specific roofing specifications to meet warranties.
- B. Blocking should withstand a min. of 200 PLF applied in any direction.
- C. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- D. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- E. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- F. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- G. Specifically, provide the following non-structural framing and blocking:
 - 1. Parapet blocking.
 - 2. Wood Cants.

3.04 INSTALLATION OF CONSTRUCTION PANELS

- A. Surface Mounted Construction Panels: Secure the long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm; space fasteners at maximum 24 inches (610 mm) on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3. Install adjacent boards without gaps.
 - 4. Size and Location: As indicated on drawings.

3.05 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.06 TOLERANCES

- A. Surface Flatness of Floor: 1/8 inch in 10 feet (1 mm/10') maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

- B. Framing Members: 1/4 inch from true position, maximum.
- C. Variation to Plane: ¼ inch in 10 feet (2 mm/m) maximum ¼ in 30 feet (7 mm in 10 m) maximum.

3.07 CLEANING

- A. Dispose of waste in accordance with applicable regulations.
 - 1. Do not burn scrap on project site.
 - 2. Do not burn scraps that have been pressure treated.
 - 3. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
- B. Do not leave any wood, shaving, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 07 19 00

WATER REPELLENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Water Repellent Treatment Applied to Exterior Exposed Masonry Unit and Concrete Walls.

1.02 QUALITY ASSURANCE

- A. The Contractors involved with work covered by this Section shall have had a minimum of five years of experience using specified techniques for water repellent treatment application.
- B. Tradesman must be competent and experienced and shall demonstrate reasonable care during performance of operations described in this Section.
- C. Tests and Approvals:
 - 1. Sample Area:
 - a. Contractor shall apply a test area of wall surface from four square feet in size for inspection and approval by the Owner's Representative after treatment has cured. Test area shall be available for comparison during the specified scope of work.
 - b. Samples of adjacent materials shall be tested for possible reaction with the water repellent treatment. Such samples shall be available for inspection by the Owner's Representative.
 - 2. If any part of this work shall be found defective (because of improper preparation of surfaces or application of water repellent treatment) at any time before the final acceptance of the item, the Contractor shall, at his own expense, make good such defect to the satisfaction of the A/E

1.03 SUBMITTALS

- A. Submit the following according to the Conditions of the Contract and Division 01 General Requirements specification sections.
 - 1. Submit product data including detailed test results of materials applied to surfaces similar to requirements of this Section.
 - 2. Submit manufacturer's instructions for methods and application procedures.
 - 3. Submit manufacturer's certification indicating water repellent treatment conforms to or exceeds requirements stated herein.

1.04 PRODUCT CONDITIONS

- A. Protection:

1. Contractor shall provide, at all times, covered access to premises and necessary utilities, space for storage of material and equipment, etc.
2. All activities shall be in compliance with local and governmental regulations and codes.
3. The surface and atmospheric temperature should be at least 40 degrees F. and rising during application and for eight hours following. Surface and air temperatures should not exceed 90 degrees F.
4. Surfaces should be dry.
5. Apply only in well-ventilated areas.
6. All caulking (sealants) should be applied a minimum of 24 hours prior to application, or as required by sealant manufacturer, whichever is greater, before application of water repellent treatment.
7. The Contractor shall require applicators to observe safety precautions as outlined on containers and labels. It is the responsibility of the Contractor to provide well ventilated areas for all workmen as well as to observe safety precautions as stipulated on labels and instructions of all materials used, and as required by governing authorities during application and drying

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Water-Based Silane/Siloxane Water Repellent Treatment:
 1. Use water-based silane/siloxane water repellent for concrete and most masonry and stucco surfaces to protect them from water penetration without altering the natural appearance.
 2. Physical and Performance Properties:
 - a. Water Absorption Reduction (Brick) per ASTM C 67: Greater than 89 percent.
 - b. Water Absorption Reduction (CMU) per ASTM C 140: Greater than 93 percent.
 - c. Water Absorption Reduction (Mortar) per ASTM D 6532: Greater than 98 percent.
 - d. Water Vapor Transmission WVT per ASTM D 6490: Minimum 4 perms.
 - e. VOC Content: Less than 30 g/L.
 3. Approved Products:
 - a. "[Sure Klean Weather Seal Siloxane PD](#) "; [PROSOCO, Inc.](#) (800-255-4255) (Basis of Design).

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify surfaces to receive water repellent treatment are clean, free of efflorescence, oil, grease, or other foreign matter detrimental to application.
- B. Remove loose particles and foreign matter. Remove grease or oil with a solvent, effective alkaline cleaner, or detergent as instructed by water repellent manufacturer. Scrub surfaces with water.
- C. Allow surfaces to dry prior to application.
- D. Protect all surrounding areas as recommended by the manufacturer or as directed by the Architect.
 1. Windows: Windows shall be protected from contact with materials by masking with polyethylene or other approved techniques.

2. All polished stone, metal, or non-masonry surfaces shall be protected from contact with the material by masking with polyethylene.
 3. Masonry surfaces must be in good repair. All new construction or repointed surfaces must be allowed to cure for a minimum of 28 days prior to application. Surfaces must be completely dry.
- E. Verify all windows, exterior intakes and air conditioning vents are covered and air handling equipment is shut down during application and until vapors have dissipated.
- F. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

3.02 INSTALLATION

- A. Test each surface and/or material to be treated to ensure compatibility and water repellent treatment results. The surface to be treated must be clean and free of all foreign matter and as dry as possible to ensure proper penetration of water repellent treatment.
- B. Do NOT dilute water repellent treatment.
- C. Proceed with application of water repellent treatment in an orderly manner once application rate has been tested; work from bottom to top of each scaffold width and from one end of each elevation to the other.
- D. Apply water repellent treatment wet-on-wet to vertical visibly dry and absorbent surfaces and comply with manufacturer's written instructions; use brush or spray application methods, at Contractor's option.
- E. Preferred method of application is with low pressure, airless diaphragm-type spray equipment or with a heavily saturated roller or brush. Apply in coverage rate as recommended by manufacturer for type of material.
- F. Spray Application:
1. Apply water repellent treatment from bottom- up using a wet-on-wet application, creating a 4 to 8 inch rundown below the spray contact point. Let the first application penetrate for 5 to 10 minutes then reapply. Apply in accordance with manufacturer recommendation. Do not spray apply at pressures exceeding 50 psi.
- G. Roller or Brush Application:
1. Thoroughly saturate the surface uniformly with water repellent treatment for 5 to 10 minutes. Avoid excessive overlapping. Backroll or brush out heavy runs and drips that do not penetrate.

3.03 PROTECTION AND CLEANING

- A. Protect adjacent surfaces not scheduled to receive water repellent treatment. If applied on unscheduled surfaces, remove immediately, by manufacturer approved method.
- B. Protect treated surfaces from rain for 6 hours.
- C. Correct damage by cleaning, repairing or replacing, and repainting, as approved by A/E.

END OF SECTION

SECTION 07 41 13

METAL PANEL ROOFING SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish and install concealed clip metal panel roofing system, including:
 - 1. Roofing manufacturer's requirements for the specified warranty.
 - 2. Preparation of roofing substrates.
 - 3. Wood nailers for roofing attachment.
 - 4. Insulation.
 - 5. Cover boards.
 - 6. Self-adhering underlayment.
 - 7. Metal roof edging and copings.
 - 8. Flashings.
 - 9. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete roofing system.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing system manufacturer, at www.holcimelevate.com.
- D. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing system manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry:
 - 1. Roof Sheathing: Plywood or oriented strand board (OSB), minimum 7/16-inch (11 mm) thickness with H-clip or tongue-and-grooved joints.
 - 2. Perimeter wood members for attachment of edge trim.
 - 3. Wood nailers associated with roof insulation installed by others.
- B. Section 07 60 00 - Sheet Metal Flashing and Trim: Formed metal flashing and trim items associated with non-metal roofing.
- C. Section 07 72 00 - Roof Accessories:

1.03 REFERENCES

- A. Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.
 - 2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
 - 3. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.

4. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.
5. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
7. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; American Society for Testing and Materials; 2011.
8. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
9. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; American Society for Testing and Materials; 2005 (Reapproved 2012)
10. ASTM E1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; American Society for Testing and Materials; 1995 (Reapproved 2011).
11. ASTM E1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; American Society for Testing and Materials; 2011.
12. MBMA - Metal Roofing Systems Design Manual; Metal Building Manufacturers Association; 2012.
13. PS 1 - Construction and Industrial Plywood; 2009.
14. PS 20 - American Softwood Lumber Standard; 2010.
15. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
16. UL 2218 - Standard for Impact Resistance of Prepared Roof Covering Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's data sheets on each product to be installed and manufacturer's standard detail drawings applicable to this project.
 1. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.
- B. Samples: Submit following samples for approval:
 1. 12 inch (300 mm) long sample of roof panel.
 2. Roof attachment clips.
 3. Color chips for selection of finish color and sheen.
 4. After selection of finish color, provide two 3- by 5-inch (75 by 125 mm) metal samples finished in color selected.
- C. Shop Drawings: Provide drawings prepared especially for this project for all relevant conditions, including plans and elevations, sections and details, specified loads, flashings, roof edges, terminations, expansion joints, curbs, penetrations, and drainage. Specifically include interfaces with materials not supplied by metal roof panel manufacturer and identify each component and its finish.
- D. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.
- E. Manufacturer's Installation Inspection Reports: Manufacturer may, at its option, inspect the installation at any time to appraise the installing contractor of their compliance with manufacturer's requirements. Typical inspections will include:

1. Prior to the installation of the metal roofing panels to inspect the underlayments. The roofing contractor is responsible for assuring that the substrate is in suitable condition for the installation of the metal roofing components to the substrate.
2. Intermediate inspections to ensure proper installation of the metal roofing panels (if required).
3. At final completion of all metal roofing system work.
4. Submit to Owner, for the project record, a copy of each report of inspection made.

F. Executed Warranty, by authorized company official upon final close-out.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Roofing installer shall have received training from metal panel manufacturer for installation of the specified roof panel system, and:
1. Current Elevate Red Shield™ licensed installer status.
 2. Having and using only equipment authorized and inspected by metal panel manufacturer.
- B. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 2. Notify Architect well in advance of meeting.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Exercise extreme care in unloading, storing, and installing metal panels to prevent bending, warping, twisting, and surface damage.
- C. Store products above ground on well-supported platforms that provide minimum of 1:48 slope. Store under waterproof covering or indoors and provide proper ventilation of metal components to prevent condensation build-up between metal components.

1.07 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- B. Manufacturer's warranty is in addition to, and not a limitation of, other rights the owner may have under the contract documents.
- C. Warranty: Elevate Red Shield Limited Warranty covering roof panels and associated metal components, roof sheathing/insulation manufactured by Elevate roofing, wall, and lining systems, and accessories, covering weathertightness, finish, materials, labor, and workmanship.
1. Limit of Liability: No dollar limitation.
 2. Scope of Coverage: Repair leaks in the roofing system caused by:
 - a. Ordinary wear and tear of the elements.
 - b. Manufacturing defect in Elevate brand materials.
 - c. Defective workmanship used to install these materials.
 - d. Damage due to winds up to 72ph.
 3. Not Covered:
 - a. Materials made by entities other than Elevate roofing, wall, and lining systems.
 - b. Damage due to winds in excess of 72 mph.
 - c. Damage due hurricanes or tornadoes.
 - d. Hail.

- e. Intentional damage.
 - f. Unintentional damage due to normal rooftop inspections, maintenance, or service.
- D. Painted Finish Warranty: Provide Elevate standard Red Shield non-prorated warranty covering durability of painted finish, to include film integrity, color change, fading, and chalking, unless otherwise indicated below.
1. Warranty Period: 25 years commencing on date of substantial completion.
 2. Metallic Colors (as identified by Elevate roofing, wall, and lining systems): Not warranted against color change or fading.
 3. Elevate Standard Color “Regal Red”: Warranted against color change or fading for a maximum period of ten (10) years.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer - Metal Roof Panels and Associated Sheet Metal Components: Elevate roofing, soffit and lining systems: www.holcimelevate.com.
1. Provide all components of system supplied or specified by same manufacturer.
 2. Roofing systems manufactured by others may be acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
 - a. Specializing in manufacturing the roofing system to be provided.
 - b. Minimum ten years of experience manufacturing the roofing system to be provided.
 - c. Able to provide a no dollar limit, single source roof system warranty that is backed by corporate assets in excess of one billion dollars.
 - d. ISO 9001 certified.
 - e. Able to provide waterproofing membrane underlayment.
 - f. Able to provide polyisocyanurate insulation.
- B. Manufacturer of Insulation: Same manufacturer as metal roof panels.

2.02 ROOFING SYSTEM DESCRIPTION

- A. Roofing System: Standing seam metal roof panels and other components, together forming a watertight assembly having the following characteristics:
1. Warranty: 20 year.
 2. Panel Seam Type: Self-locking; not requiring field seaming, concealed clip attachment to substrate.
 3. Panel Material: Steel, 24 gauge (0.64 mm) with fluoropolymer finish, over G90 hot-dipped galvanized coating.
 4. Color: To be selected from manufacturer’s standard and premium colors.
 5. Design Loads: In accordance with ASCE 7, current edition.
 - a. Design Snow Load: Not less than 20 psf (960 kPa).
 - b. Maximum Deflection Under Snow Load: Not more than L/180 or as recommended by ASCE 7, whichever is less.
 - c. Wind Uplift Resistance: Class 90 rating, minimum, when tested in accordance with UL 580.
 - d. Wind Pull-Off Resistance: No failure of roof panel or fasteners when tested in accordance with ASTM E1592 for negative loading equal to negative design wind load; for assemblies not tested, capacity for gauge, span, or loading may be determined by interpolating between test values only.
 6. Impact Resistance: Minimum of Class 4, when tested in accordance with UL 2218.
 7. Thermal Effects: Design roof panels and their attachment to allow free movement in response to expansion and contraction forces resulting from temperature variation, as specified in the MBMA Metal Roofing Systems Design Manual.

8. External Fire Resistance: Class A when tested in accordance with ASTM E108 or UL 790.
 9. Provide all necessary members and connections, whether indicated in the manufacturer's standard detail drawings or not.
 10. Accessories and Their Fasteners: Capable of resisting the specified design wind uplift forces and allowing for thermal movement of the roof panel system, not restricting free movement of the roof panel system resulting from thermal forces except at designed points of roof panel fixity.
- B. Roof System Components: In order from the top down:
1. Metal roofing panels and trim.
 2. Underlayment: Self-adhering, high temperature underlayment over entire roof; material as specified.
 - a. Clad-Gard MA over field conditions.
 - b. Clad-Gard SA over critical and edge conditions.
 3. Insulation cover board.
 4. Roof Insulation: Polyisocyanurate foam insulation board.
 - a. Thickness: see drawings.
 5. Cover Board: plywood, minimum 7/16 inch (11 mm) thick.

2.03 ROOF PANELS AND SHEET METAL FABRICATIONS

- A. Roof Panels: Elevate UNA-CLAD UC-14 Standing Seam Roofing; roll formed roofing panels produced in a permanent factory environment with fixed-base roll-forming equipment.
1. Seam Height: 1-3/4 inches (44.5 mm).
 2. Seam Spacing (Panel Width): 16 inches (475.2 mm), optimal.
 2. Profile: Flat.
 3. Texture: Smooth.
 4. Provide factory applied integral seam sealant in leg of panel.
 5. Concealed clips as tested and supplied by manufacturer.
 6. Form roofing panels in longest practical lengths, true to shape, accurate in size, square, and free from distribution or manufacturing defects.
- B. Steel Sheet: ASTM A653/A653M, lock-forming quality, extra smooth, tension-leveled, galvanized/galvannealed steel, minimum spangle.
- C. Fluoropolymer Coating: 70 percent full strength Kynar 500/Hylar 5000.
1. Exposed Surface: 1.0 mil (0.25 mm) plus/minus 0.1 mil (0.025 mm) total dry film thickness.
 2. Concealed Surface: 0.2 to 0.3 mils (0.05 to 0.08 mm) total dry film thickness.
 3. Color: To be selected from manufacturer's standard and premium colors.
- D. Sheet Metal Components Associated with Metal Roof Panels: Made by same manufacturer and compatible with roof panels; of not less than minimum thickness required by roof panel manufacturer.
1. Fabricate trim, flashing, and accessories to roofing manufacturer's specified or approved profiles.
 2. Exposed metal components of same finish as panels.
 3. Color: Dark Ivy
 4. Provide the following formed sheet metal components as needed.
 - a. Eave.
 - b. Ridge.
 - c. Hip.
 - d. High eave.
 - e. Rake edge.
 - f. Vertical fascia.
 - g. Side wall flashing.
 - h. Pipe and other penetration flashings, for penetrations over 8 inches.

- i. Flashings at interface to other roofing types.
- j. Other flashings.
- k. Copings, parapet covers.
- l. Soffit panels, UC-500 flush panel – color to be selected by architect.

2.04 ROOF INSULATION AND COVER BOARDS

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C1289 Type I Class 1, with the following additional characteristics:
 - 1. Thickness: As indicated elsewhere.
 - 2. Thermal Value: R-value of 5.7 per 1 inch, when tested in accordance with ASTM C1289-13.
 - 3. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C1289.
 - 4. UL-Classified and FM-approved for direct to steel deck applications.
 - 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - 6. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 - 7. Acceptable Product: ISO 95+™ / ISOGARD™ GL Polyisocyanurate Insulation by Elevate roofing, wall, and lining systems.
 - 8. roofing, wall, and lining systems.
- B. Insulation/Cover Board Fasteners: Type and size as required by roof system manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof system manufacturer.

2.05 ACCESSORY MATERIALS

- A. Self-Adhered Underlayment: Rubberized sheet waterproof membrane complying with ASTM D 1970/D1970M, self-adhering.
 - 1. Resistance to Direct Exposure: At least 90 days.
 - 2. Minimum High Temperature Resistance: 230 degrees F (110 degrees C).
 - 3. Water Vapor Permeance: 0.1 perm (5.7 ng/(Pa s sq m)), maximum.
 - 4. Acceptable Product: Clad-Gard™ SA by Elevate roofing, wall, and lining systems
- B. Fasteners: In strict accordance with metal roof panel manufacturer's requirements; minimize exposed fasteners.
 - 1. Fasteners Exposed to Weather: Sealed or with sealed washers on exterior side of covering to waterproof fastener penetration; washer material compatible with screw head; minimum 3/8-inch (9.5 mm) diameter washer for structural connections; gasket portion of fasteners or washers made of EPDM, neoprene, or other equally durable elastomeric material.
 - 2. Fasteners Exposed to View: Head of color matching panel or component in which installed.
- C. Installation Clips: Manufacturer standard galvanized or stainless-steel clips, as required by panel selection, for concealed securement of panels. Use only those approved for use by the roof system manufacturer.

PART 3 – INSTALLATION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.

- C. Verify that shop drawings prepared by metal roof panel manufacturer have been approved and are available to installers; do not use drawings prepared by others for installation drawings.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.
- E. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- F. Perform work using competent and properly equipped personnel.
- G. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- H. Install roofing only when surfaces are clean, dry, smooth, and free of snow or ice; do not apply roofing during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- I. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- J. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- K. Consult panel manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers, and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Verify that the substructure installation is in accordance with the approved shop drawings and roof panel manufacturer's requirements, that the fasteners are correct for the substrate, and the substrate is installed to accommodate and support the appropriate clip spacing and attachment.
- D. Verify that installed work of other trades that such work is complete to a point where the roofing system installation may commence.
- E. Verify that roof openings, curbs, pipes, sleeves, ducts, vents, and other penetrations through roof substrate are complete and properly located.

- F. In event of discrepancy, notify Architect in writing; do not proceed with installation until discrepancies have been resolved.

3.03 INSULATION INSTALLATION

- A. Install insulation over entire area to be roofed, mechanically fastened as required by roofing manufacturer.
- B. Provide wood nailers at all perimeters of insulation and at other locations where indicated on the drawings, of total height matching the total thickness of insulation being used.
 - 1. Install with 1/8-inch (3 mm) gap between each length and at each change of direction.
 - 2. Mechanically fasten to deck to resist force of 200 lbf per linear foot (35 kN/m).

3.04 COVER BOARD INSTALLATION

- A. Install cover board over entire area to be roofed, mechanically fastened as required by roofing manufacturer.

3.05 UNDERLAYMENT INSTALLATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Install self-adhered underlayment over entire roofing surface.

3.06 ROOF PANEL INSTALLATION

- A. Install the metal roof panel system in accordance with the manufacturer's instructions, installation drawings, and approved shop drawings, so that it is weathertight and allows for thermal movement.
- B. Locate space and fasten all clips in accordance with roof panel manufacturer's recommendations. For required fasteners, use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the sealing washers.
- C. Do not place utility penetrations through the panel seams.
- D. Do not allow panels or trim to come into contact with dissimilar materials (i.e., copper, lead, graphite, treated lumber, mortar, etc.). Protect from water run-off from these materials.
- E. Perform field cutting of panels and related sheet metal components by means of hand or electric shears. At no time shall a hot/friction saw be used.
- F. Remove protective film immediately after installation.

3.07 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by roof panel manufacturer's recommendations and details.
- B. Install metal trim, accessories, and edgings in locations indicated on the drawings.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
- C. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing system abuts to; extend flashing at least 8 inches high above system surface.

- D. Flashing at Penetrations: Flash all penetrations passing through the panel; make flashing seals directly to the penetration.
 - 1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical.
 - 2. Where pre-molded pipe flashings are not practical, provide flashing detail as recommended by metal panel manufacturer.

3.08 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e., not a salesperson).
- B. Perform all corrections necessary for issuance of warranty.

3.09 ADJUSTING AND CLEANING

- A. Repair panels having minor damage.
- B. Remove panels damaged beyond repair and replace with new panels to match adjacent undamaged panels.
- C. Clean exposed panel surfaces promptly after installation in accordance with recommendations of panel and coating manufacturers.
- D. Clean all contaminants generated by roofing work from building and surrounding areas, including adhesives, sealants, and coatings.
- E. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- F. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.10 PROTECTION

- A. Where construction traffic must continue over finished roof panels, provide durable protection, and replace or repair damaged roofing to original condition.

END OF SECTION

SECTION 07 42 13

METAL WALL PANELS

PART 1 - GENERAL

1.01 SCOPE

- A. This Section includes
 - 1. Factory-formed: concealed-fastener, metal wall panels.
 - 2. Finish must conform to the "Metal Construction Association Certified Premium Painted™" designation

1.02 RELATED SECTIONS

- A. 06 10 00 - Rough Carpentry: Coordinate attachment of materials to others.
- B. 07 41 13 – Metal Roof Panels: Coordinate attachment of materials to others.
- C. 07 53 23 – Single-Ply Roofing: Coordinate attachment of materials to others.

1.03 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. System shall meet performance criteria as installed. Either test data or signed and sealed engineering calculations shall document the performance of the panel system to meet design loads required.
- C. Wind Loading: Design and size components to withstand dead and live loads caused by wind pressures as noted on structural drawings
- D. Maximum Deflection under Design Loads: Refer to Structural Drawings
- E. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24lbf/sq. ft.
- F. Water Penetration: No water penetration when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Installed by a contractor with a minimum of five (5) years' experience with this type of construction, and documentation indicating successful completion of contracts for projects of similar size, scope and materials.
- B. Manufacturer's Qualifications: The manufacturer shall have a minimum of ten (10) years' experience in production of factory foamed-in-place insulated metal panels.

1.05 SUBMITTALS

- A. Submit shop drawings and manufacturer's product data to Architect for approval. Shop

drawings shall indicate location and size of panels, openings, flashing, and trims.

- B. Indicate all connection details and required accessories and show weatherproofing techniques, terminations and penetrations.
- C. Submit two color charts of stock colors and finishes and 2 actual samples of Architect's final selections.

1.06 DELIVERY, STORAGE, & HANDLING

- A. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
- B. Protect materials from damage during transit and at project site. Store under cover but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
- C. Do not allow storage of other materials or allow staging of other work on installed metal panel system.
- D. Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment for damage and for completion of the consignment.

1.07 WARRANTY

- A. Warranty: Wall panels to be included in 20 Year NDL Roofing Warranty covering membrane, roof insulation and membrane accessories.
- B. Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal panels that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 EXTERIOR PANEL DESIGN

- A. ACCEPTABLE MANUFACTURERS
 - 1. PAC-CLAD Petersen: Flush w/ 1 rib.
- B. Concealed-fastener, Lap seam Metal Wall Panels: Provide factory-formed metal wall panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- C. Flush Profile Panels: Structural metal panels consisting of formed metal sheet with vertical panel edges and flat pan with two intermediate stiffening beads, symmetrically placed with flush joints between panels, field assembled with interlocking lapped edges, and attached to supports using concealed fasteners.
 - 1. Material: Metallic coated steel sheet - 24 gauge thick
 - a. Texture: Smooth.
 - b. Finish: KYNAR 5000® PDVF or HYLAR 5000® Finish.
 - c. Colors: to be selected by architect
 - 2. Panel Coverage: 12"

3. Panel Height: 1"
4. Panel Application Orientation: Vertical.

2.02 FABRICATION

- A. Panels:
 1. Panels to be Factory fabricated in a controlled environment.
 2. Panels to be tension leveled during roll forming process.
 3. Panels to be produced in longest lengths possible, except when modular units are utilized.
- B. Form all components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings or as required by field conditions.
- C. Accessories: Factory fabricates trim and flashing components in standard 12-foot lengths.
 1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
 2. Fabricate wall panels as required to maintain fabrication tolerances and to withstand design loads.
- D. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- E. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- F. Panels, fabrication and installation shall meet the requirements of the Metal Construction Association Preformed Metal Wall Guidelines

PART 3 - EXECUTION

3.01 PREPARATION

- A. Field Measurements
 1. Field measurements should be taken by the installer for verification of dimensional correctness in relationship to original plans, prior to providing manufacturer with a bill of material.
- B. Delivery, Storage and Handling
 1. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
 2. Protect materials from damage during transit and at project site. Store under cover, but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
 3. Do not allow storage of other materials or allow staging of other work on installed metal panel system.
 4. Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment or damage and for completion of the consignment.
- C. Sequencing and Scheduling
 1. Installer shall coordinate with general contractor as to scheduled delivery time after receipt of field verified bill of material by manufacturer as it relates to actual project

scheduling.

3.02 PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and sub girts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of metal wall panels by torch is not permitted.
 - 2. Rigidly fasten metal wall panels and allow for thermal expansion and contraction as required by the panel manufacturer. Pre-drill panels as required.
 - 3. Install screw fasteners.
 - 4. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 5. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing and material compatibility.
 - 6. Provide weatherproof seals for pipe and conduit penetrating exterior walls.
- B. Fasteners: Use fasteners of size and length as required for compatibility with substrate.
 - 1. Concealed fasteners shall have a high-performance coating
 - 2. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.
- C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies.
- D. Provide water and air infiltration retarder / barriers as noted within project documents.

3.03 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete sheet metal roofing assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 - 2. Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual" and NRCA Waterproofing Manual. Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 3. Panels, fabrication and installation shall meet the requirements of the Metal Construction Association Preformed Metal Wall Guidelines.

3.04 DAMAGED MATERIAL

- A. Replace damaged panels and other components of work that cannot be repaired by finish touch-up or similar minor repair.
- B. The panel installer shall inspect and approve each completed wall area and shall be responsible for protection of completed work from damage by other trades.

3.05 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed. Maintain in a clean condition during construction.
- B. Protection:
 - 1. Provide as required completed work of this section will be without damage or deterioration at date of substantial completion.
- C. Touch up minor abrasions with matching paint provided by panel manufacturer. Remove and replace panels that cannot be satisfactorily touched up. See Metal Construction Association Technical Bulletin #95-1051.
- D. Sweep and remove chips, shavings and dust from roof daily during installation period. Leave installed work clean, free from grease, finger marks and stains. Remove all protective masking from material immediately after installation of product.
- E. Upon completion of installation, remove scraps and debris from project site.
- F. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt and sealant.

END OF SECTION

SECTION 07 53 23
SINGLE-PLY ROOFING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This contractor shall furnish all labor and materials and perform all work required for the installation of a 60 mil. Fully-Adhered Non-reinforced Single-Ply EPDM Membrane roof system including:
1. Roofing manufacturer's requirements for the specified warranty.
 2. Preparation of roofing substrates.
 3. Wood nailers for roofing attachment.
 4. Perimeter Edge & Penetration Air Barrier
 5. Rigid Insulation.
 6. Single-Ply EPDM Membrane Roof System
 7. Roof terminations and expansion joints.
 8. Roof Edge Flashing / Metal and drainage.
 9. Walkway pads.
 10. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at www.holcimelevate.com.
- D. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. Any modification of the Contract Sum will be made in accordance with the stipulations of the Contract Documents stated elsewhere.

1.02 RELATED SECTIONS

- A. Section 06 10 00 – Rough Carpentry: Wood nailers associated with roofing and roof insulation.
- B. Section 07 60 00 – Flashing and Sheet Metal
- C. Section 07 72 00 – Roof Accessories
- D. Section 07 72 33 – Roof Hatch

1.03 REFERENCES

- A. ANSI/ SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roof Systems".
- B. American Society for Testing and Materials (ASTM):
1. ASTM C 1177/C 1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2006.

2. ASTM C 1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.
3. ASTM D 3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
4. ASTM D 4637 – Standard Specification for EPDM Sheet used in Single-Ply Roof Membrane; 2004.
5. ASTM D 4811 – Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing; 2004.
6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
7. ASTM E 136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
8. FM 1-28 – Design Wind Loads; Factory Mutual System; 2007.
9. FM 1-29 – Roof Deck Securement and Above Deck Roof Components; Factory Mutual System; 2006.
10. FM 4470 – Approval Standard - Class I Roof Covers; current version.
11. PS 1 – Construction and Industrial Plywood; 2009.
12. PS 20 – American Softwood Lumber Standard; 2010.

1.04 EXTENT OF WORK

- A. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of a 60mil. Fully-Adhered Non-reinforced EPDM membrane Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
- B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
- C. The roofing contractor shall confirm all given information and advise the building owner and designer, prior to bid, of any conflicts that will affect their cost proposal.

1.05 SUBMITTALS

- A. Product Data:
 1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
 2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable; include data itemizing the components of the classified or approved system.
 3. Installation Instructions: Provide manufacturer's instructions to installer, marked up to show exactly how all components will be installed; where instructions allow installation options, clearly indicate which option will be used.
- B. Shop Drawings: Provide:
 1. The roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
- C. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.

- D. Executed Warranty as a requirement of project close-out.
- E. Specimen Warranty: Submit prior to starting work.
- F. Samples: Submit samples of each product to be used.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- B. Comply with the manufacturer's written instructions for proper material storage.
 - 1. Store materials between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 - 2. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- C. Insulation and underlayment products must be on pallets, off the ground and tightly covered with 6 mil. poly and tarps to provide waterproof enclosure. Manufacturer's wrap does not provide sufficient waterproofing. Insulation and underlayment products that become wet or saturated are to be discarded.
- D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.07 WORK SEQUENCE

- A. Roofing Contractor and heads of all trades working on the roofing system will be required to attend the owners Pre-Construction Conference.
- B. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- C. Do not disrupt activities in occupied spaces.

1.08 USE OF THE PREMISES

- A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:
 - 1. Areas permitted for storage of materials and debris.
 - 2. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.
- B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

1.09 EXISTING CONDITIONS

- A. Prior to bid submittal, the roofing contractor should schedule a job site inspection to observe actual conditions and verify all dimensions and conditions on the roof. The job site inspection may occur on the day of the pre-bid meeting.

- E. If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

1.10 JOB SITE PROTECTION

- A. The roofing contractor shall adequately protect building, paved areas, service drives, lawn, shrubs, trees, etc. from damage while performing the required work. Provide canvas, boards and sheet metal (properly secured) as necessary for protection and remove protection material at completion. The contractor shall repair or be responsible for costs to repair all property damaged during the roofing application.
- B. During the roofing contractor's performance of the work, the building owner will continue to occupy the existing building. The contractor shall take precautions to prevent the spread of dust and debris, particularly where such material may sift into the building. The roofing contractor shall provide labor and materials to construct, maintain and remove necessary temporary enclosures to prevent dust or debris in the construction area(s) from entering the remainder of the building.
- C. Do not overload any portion of the building, either by use of or placement of equipment, storage of debris, or storage of materials.
- D. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.
- E. Take precautions to prevent drains from clogging during the roofing application. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drain.
- F. Store moisture susceptible materials above ground and protect with waterproof coverings.
- G. Remove all traces of piled bulk materials and return the job site to its original condition upon completion of the work.

1.11 SAFETY

- A. The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full-time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

1.12 WORKMANSHIP

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

- D. All field seams and flashing details are to be completed according to manufacturer's specifications and details by the end of each workday.

1.13 QUALITY ASSURANCE

- A. The Roofing System must achieve a UL Class C.
- B. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to International Building Code (IBC) and American Society of Civil Engineers (ASCE 7) ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies" and ANSI/SPRI ES-1 "Wind Design Standard for Edge Systems Used with Low Slope Roof Systems".
- C. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made by others are not acceptable.
- D. The manufacturer must have a minimum of 20 years' experience in the manufacturing of vulcanized thermoset sheeting.
- E. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- F. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply EPDM roofing systems and having installed at least one (1) EPDM roofing application or several similar systems of equal or greater size within one year.
- G. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- H. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.
- I. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to identify any needed corrective repairs that will be required for warranty issuance. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.
- J. Inspector shall be employed and trained by the manufacturer and have received product-specific training from the manufacturer of the products.
- K. The EPDM Membrane shall meet or exceed 41,580 kJ/m² under Xenon-Arc UV Light testing used for testing "Resistance to Outdoor (Ultraviolet) Weathering." (ASTM D 4637 Specification requires a 7560 kJ/m² minimum total radiant exposure at 70 W/m² irradiance at 176oF black panel temperature to pass.) The membrane shows no visible signs of cracking or crazing.

1.14 JOB CONDITIONS, CAUTIONS AND WARNINGS

- A. Material Safety Data Sheets (MSDS) must be on location at all times during the

transportation, storage and application of materials.

- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- C. When loading materials onto the roof, the Manufacturer's Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- D. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, 3/4 inch thick plywood and 2" insulation, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weathertight at the end of the workday.
- I. Contaminants such as grease, fats and oils shall not be permitted to come in direct contact with the roofing membrane. An overlay of Epichlorohydrin membrane must be adhered around units which have the potential to emit solvents, grease or oil.

1.15 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling and inspections.
- B. Warranty: 20 Year NDL Warranty covering membrane, roof insulation, all metal wall and edge components and membrane accessories.
 - 1. Limit of Liability: No dollar limitations
 - 2. Scope of Coverage: repair leaks in the roofing system caused by:
 - a. Ordinary wear and tear of the elements.
 - b. Manufacturing defect in brand materials.
 - c. Defective workmanship used to install these materials.
 - d. Damage due to winds up to 72 mph.
 - 3. Not Covered:
 - a. Damage due to winds in excess of 72 mph.
 - b. Damage due to hurricanes or tornados.
 - c. Intentional damage.
- C. Warranty: 5 Year Warranty covering the installation of products to be free from defects in workmanship from the date the project is substantially completed for a period of 5 years of normal use.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. All Acceptable Manufacturer - Roofing System: Elevate roofing, wall, and lining systems. www.holcimelevate.com.
 - 1. Roofing systems manufactured by others may be acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
 - a. Specializing in manufacturing the roofing system to be provided.
 - b. Minimum ten years of experience manufacturing the roofing system to be provided.
 - c. Able to provide a no dollar limit, single source roof system warranty that is backed by corporate assets in excess of one billion dollars.
 - d. ISO 9001 certified.
 - e. Able to provide polyisocyanurate insulation that is produced in own facilities.
- B. Manufacturer of Insulation and Cover Board: Same manufacturer as roof membrane.
- C. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
 - 1. Metal roof edging products by other manufacturers are not acceptable.
 - 2. Field- or shop-fabricated metal roof edgings are not acceptable.

2.02 ROOFING SYSTEM

- A. Roofing System:
 - 1. Membrane: Ethylene propylene diene monomer (EPDM).
 - 2. Thickness: As specified elsewhere.
 - 3. Membrane Attachment: Fully adhered.
 - 4. Slope: Deck is sloped but not enough; provide additional slope of 1/4 inch per foot (1:48) by means of tapered insulation.
 - 5. Comply with applicable local building code requirements.
 - 6. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
 - 7. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28 and 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.
- B. Roofing Materials:
 - 1. Roofing and Flashing Membrane: Black cured synthetic single-ply membrane composed of ethylene propylene diene terpolymer (EPDM) with the following properties:
 - . Thickness: 0.060 inch (1.5 mm).
 - a. Reinforcement: Polyester weft inserted scrim; membrane complying with ASTM D 4637 Type II.
 - b. Nominal Thickness Tolerance: Plus/minus 10 percent.
 - c. Sheet Width: Provide the widest available sheets to minimize field seaming.
 - d. Acceptable Product: RubberGard Non-Reinforced EPDM Membrane by Elevate.
 - 2. Membrane Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
 - 3. Flashing Membrane: Self-curing, non-reinforced membrane composed of nonvulcanized EPDM rubber, complying with ASTM D 4811 Type II, and with the following properties:
 - a. Thickness: 0.055 inch (1.4 mm).
 - b. Color: Same as field membrane
 - c. Acceptable Product: RubberGard EPDM FormFlash™ by Elevate.
 - 4. Self-Adhesive Flashing Membrane: Semi-cured 45 mil EPDM membrane laminated to 35 mil (0.9 mm) EPDM tape adhesive; QuickSeam™ Flashing by Elevate.

5. Pre-Molded Pipe Flashings: EPDM, molded for quick adaptation to different sized pipes; Elevate EPDM Pipe Flashing.
6. Self-Adhesive Lap Splice Tape: 35 mil (0.9 mm) EPDM-based, formulated for compatibility with EPDM membrane and high-solids primer; QuickSeam Splice Tape by Elevate.
7. Splice Adhesive: Synthetic polymer-based, formulated for compatibility with EPDM membrane and metal surfaces; SA-1065 Splice Adhesive by Elevate.
8. Bonding Adhesive: Neoprene-based, formulated for compatibility with EPDM membrane and wide variety of substrate materials, including masonry, wood, and insulation facings; Bonding Adhesive BA-2004 by Elevate.
9. Adhesive Primer: Synthetic rubber-based primer formulated for compatibility with EPDM membrane and tape adhesive, with VOC content less than 2.1 lb/gal (250 g/L); QuickPrime Plus LVOC by Elevate.
10. Low Rise Foam Adhesive: Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates; ISO Stick by Elevate.
11. Seam Edge Treatment: EPDM rubber-based sealant, formulated for sealing exposed edges of membrane at seams; Lap Sealant HS by Elevate.
12. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Elevate.
13. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal by Elevate.
14. Metal Plates and Strips Used for Fastening Membrane and Insulation: Steel with Galvalume coating; corrosion-resistance meeting FM 4470 criteria.
 - a. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches (33 mm) wide by 0.10 inch (2.5 mm) thick; Termination Bar by Elevate.
15. Roof Walkway Pads: EPDM, 0.30 inch (7.6 mm) thick by 30 by 30 inches (760 by 760 mm) with EPDM tape adhesive strips laminated to the bottom; QuickSeam Walkway Pads by Elevate.

2.03 PERIMETER EDGE & PENETRATION AIR BARRIER:

- A. Air & Vapor Barrier: A 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt factory laminated to a 5-mil polyethylene film with an adhesion textured surface. Product is applied after cleaning, drying and priming an acceptable substrate with manufacture's approved primer.
- B. Install high-density closed-cell polyurethane foam or filler insulation pieces to support the edge stripping.

2.04 PROTECTION TOP SHEET

- A. Sacrificial Top Sheet: Rubbergard Neoprene Membrane or like kind self-curing material for protection layer over EPDM roofing systems from rooftop contaminants (i.e., grease, animal fats).
- B. Refer to plans for application locations.

2.05 INSULATION

- A. Insulation shall be ISO 95+™ GL / ISOGARD GL polyiso board insulation by Elevate as supplied by Manufacturer. Minimum R-value required is R-25 for total base insulation for flat areas and R-30 for sloped roofs. (Note: The insulation must meet ASHRAE 90.1 minimums per IBC-International Building Code.)
 1. Polyisocyanurate – A foam core insulation board covered on both sides with a

medium weight fiber-reinforced felt facer meeting ASTM C 1289-06, Type II, Class 1, Grade 3 (20 psi). Use 4x4 sheets for adhered systems and 4x8 for mechanically attached systems. Minimum R-value of 5.7 per 1" layer.

2. Insulation shall be installed in multiple layers. The layers of insulation shall be mechanically fastened or adhered to the substrate in accordance with the manufacturer's published specifications and drawings. Stagger joints in adjacent layers with 12" stagger in all directions at all board joints. No joints shall align throughout the system.
- B. Tapered Insulation: Install fully-adhered 1/4" (1/8" where indicated) tapered insulation package as identified in Part 1 of this specification per Building as supplied by Manufacturer.
- C. Crickets and Edge Strips: Shop fabricated to provide proper drainage/ taper/ crickets indicated. Comply with requirements of ASTM C 1289.

2.05 METAL ACCESSORIES

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
1. Wind Performance:
 - a. Membrane Pull-Off Resistance: 100 lbs/ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition.
 - b. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-2, current edition.
 - c. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-270 rating.
 2. Description: Two-piece; 45 degree sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia; Elevate EdgeGard™.
 3. Fascia Face Height: see drawings.
 4. Edge Member Height Above Nailers: see drawings.
 5. Fascia Material and Finish: 24 gage, 0.024 inch (0.06 mm) galvanized steel with Kynar 500 finish in manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
 6. Length: 144 inches (3650 mm).
 7. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
 8. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
 9. Anchor Bar Cleat: 20 gage, 0.036-inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
 10. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
 11. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14 inch (355 mm) long legs on corner pieces.
 12. Scuppers: Welded watertight.
 13. Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings.

2.06 ACCESSORY MATERIALS

- A. Wood Nailers: PS 20-dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.

1. Width: 3-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
 2. Thickness: Same as thickness of roof insulation.
- B. Pre-Molded Pipe Flashing: EPDM, molded for quick adaptation to different sized pipes; EPDM Pipe Flashing.

PART 3 – EXECUTION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install roofing membrane only when surfaces are clean, dry, smooth, and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
1. Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.
 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers, and cleaning materials away from all sources of ignition.
- J. Installation of Wood Nailers:
1. Install treated lumber at the same heights as adjacent construction \pm 1/4 inch. Continuous treated wood nailers are to be installed around roof projections and penetrations as shown in approved details.

2. Where wood nailers are installed directly on the substrate, the substrate shall be carefully examined to confirm that the entire area provides a suitable fastening surface. All defects shall be repaired by the appropriate trade prior to installation.
3. Nailers shall be at least 2x6 inches nom. high and installed and anchored in such a manner to resist a force of 250 lbs. per linear foot of wood blocking in any direction.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.03 PREPARATION

- A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease, and other materials that may damage the membrane.
- C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

3.04 AIR BARRIER (Perimeter and penetration only)

- A. Consult the latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.
- B. If insulation is to be adhered to the vapor barrier with adhesive, the vapor barrier must be compatible and shall be fully adhered to the substrate as approved by the manufacturer. Refer to the manufacturer's Installation requirements for Air and Vapor Barriers.
- C. Installation:
 1. Surface Preparation: The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, lath and form release agents. In the event of rain, concrete must be allowed to dry before primer is applied.
 2. Primer: Surfaces to receive Air and Vapor Barrier must be clean and dry. Prime with manufacturer's approved Primer. Apply Primer by spray, brush or with a long nap roller at the applicable coverage rate noted above. At 75° F allow primer to dry 1 hour minimum. Primer has a satisfactory cure when it will not transfer when touched. Prime only areas to be waterproofed the same day. Re-prime if area becomes dirty.
 3. Application: Apply Air and Vapor Barrier from low to high point, in a shingle fashion, so that laps will shed water. Overlap all edges at least 2-1/2". End laps shall be

staggered. Place membrane carefully so as to avoid wrinkles and fishmouths. Immediately after installation, roll with a 100-150 pound weighted steel roller. Refer to Manufacturer's Details on Deck-to-Wall and Penetration air infiltration resistance barriers.

4. Seaming: Apply a 2" long bead of lap sealant internally along any T-joints or step-offs. Use a hand roller or stand-up seam roller to mate the entire seam together, ensuring the seam's leading edge is rolled properly. Be sure to pay particular attention to the T-joints and step-offs. If seam surface is contaminated, clean and prime with Manufacturer's approved Primer.
5. Insulation Installation: Ensure surface of the Air and Vapor Barrier is dry prior to installing insulation. Place insulation over the surface and adhere to the vapor barrier with manufacturer's approved Adhesive in accordance with Manufacturer's Specification.

3.05 INSULATION PLACEMENT & INSTALLATION

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints 12 inches, both horizontally and vertically when multiple layers are provided.
- B. Secure insulation to the substrate with the required mechanical fastener or insulation adhesive in accordance with the Manufacturer's specifications and drawings.
- C. Butt units tightly together and against wood blocking and nailers; trim to fit penetrations and interruptions, so that gaps between units and between insulation and adjacent construction do not exceed 1/4 inch.
- D. Provide preformed units to provide crickets, saddles, and tapered areas as indicated or as required to provide drainage. Taper insulation around all roof drains and projections to ensure proper drainage.

3.06 MEMBRANE PLACEMENT AND BONDING

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended

by roofing manufacturer.

3.07 MEMBRANE SPLICING

- A. Position membrane sheet to allow for required splice overlap. Mark the bottom sheets with an indelible marker approximately 1/4" to 1/2" from the top sheet edge. The pre-marked line on the membrane edge can also be used as a guide for positioning splice tape.
- B. When the membrane is contaminated with dirt, fold the top sheet back and clean the dry splice area (minimum 6" wide) of both membrane sheets by scrubbing with clean natural fiber rags saturated with Membrane Cleaner.
- C. Apply EPDM Primer to splice area and permit to flash off.
- D. When adhering Factory Applied Tape (FAT), pull the poly backing from FAT beneath the top sheet and allow the top sheet to fall freely onto the exposed primed surface. Press top sheet on to the bottom sheet using firm even hand pressure across the splice towards the splice edge
- E. For end laps, apply 6" EPDM Factory Applied splice tape to the primed membrane surface in accordance with the manufacturer's specifications. Remove the poly backing and roll the top sheet onto the mating surface.
- F. Tape splices must be a minimum of 2-1/2" wide using 6" wide EPDM Factory Applied splice tape extending 1/8" minimum to 1/2" maximum beyond the splice edge. Field splices at roof drains must be located outside the drain sump.
Note: For projects where a 60-mil membrane OR 20-year or longer System Warranty is specified, splice enhancements are required. Refer to Manufacturer's Roofing System Specification.
- G. Immediately roll the splice using positive pressure when using a 2" wide steel roller. Roll across the splice edge, not parallel to it. When FAT is used, Manufacturer's Stand-Up Seam Roller can be used to roll parallel to the splice edge.
- H. At all field splice intersections, apply Lap Sealant along the edge of the membrane splice to cover the exposed EPDM Factory Applied splice tape 2" in each direction from the splice intersection. Install Manufacturer's Pressure-Sensitive "T" Joint Covers or a 6" wide section (with rounded corners) of EPDM Pressure-Sensitive Flashing over the field splice intersection.

3.08 FLASHING

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
 - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
 - 6. If the roof edge includes a gravel stop and sealant is not applied between the laps in

the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.

7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- D. Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing manufacturer.
- E. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.
1. Use the longest practical flashing pieces.
 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- F. Roof Drains:
1. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed manufacturer's recommendations.
 2. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.
 3. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
 4. Apply sealant on top of drain bowl where clamping ring seats below the membrane
 5. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.
- G. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
 2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
 3. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
 4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

3.09 WALKWAYS

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
1. Use specified walkway pads unless otherwise indicated.
- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.

1. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.10 FIELD QUALITY CONTROL

- A. Where construction traffic must continue over finished roof membrane, provide durable protection, and replace or repair damaged roofing to original condition.
- B. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
- C. Perform all corrections necessary for issuance of warranty.

3.11 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the workday, a daily seal must be performed. Note: A temporary seal should be performed at the conclusion of daily work and use of the appropriate method will vary based on project and project conditions. Contact Manufacturer for various methods that may be utilized.

3.12 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- C. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and
- D. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work in this Section is to physically protect the membrane roofing and base flashings from damage that would permit water leakage to building interior.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Treated wood nailers and blocking for attachment of flashing and sheet metal items.
- B. Section 07 41 13 – Metal Roof Panels: Coordination of materials and joinery
- C. Section 07 42 13 – Metal Wall Panels: Coordination of materials and joinery
- D. Section 07 53 23 – Single-Ply Roofing: Coordination of materials and joinery
- E. Section 07 92 00 - Sealants and Caulking: Joint sealers installed to ensure water tightness.

1.03 QUALITY ASSURANCE

- A. All flashing shall be installed as indicated on drawings. All flashings, including flashings not particularly shown, but required for finish work shall be furnished and installed in strict accordance with Sheet Metal and Air Conditioning Contractors National Association recommendations. Where not otherwise shown, all exposed (exposed to view) flashing shall be prefinished 24 gauge (minimum) galvanized steel. Roof area flashing not exposed to view shall be minimum 24 gauge galvanized steel.
- B. Definition: The term “prefinished” shall be interpreted to mean Kynar 500 full strength Fluoropolymer.
- C. The work specified under this section shall be installed by the Membrane Roofing Contractor and shall be considered as one roof system when complete.

1.04 SUBMITTALS

- A. Submit detailed shop drawings on items requiring fabrication and manufacturer's technical data on manufactured products. Submittals shall indicate materials, finish, profiles, installation techniques and required anchoring devices. Submit shop drawings in accordance with Section 01 33 00.
- B. For gutters, show material thickness, profiles, anchorage technique and gutter bracket size and spacing.

1.05 GUARANTEE

- A. Guarantee all flashings to remain weathertight. Flashings associated with Roof warranty shall be for a period of 20 years.
- B. Finish Warranty: Provide manufacturer's standard 20-year written warranty for finish

applied to sheet metal items.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Flashing Materials:
 - 1. Flashings, coping, trim, etc., exposed to view, etc., shall be prefinished 24 gauge (or as required by the girth dimension in accordance with SMACNA) galvanized steel, smooth surface and Kynar 500 full strength Fluoropolymer finish, color(s) as selected by Architect. Provide flashing in 10' lengths, minimum. Provide 22 gauge cleats to prevent wind uplift and peel-off.
 - 2. Roof area flashing and other miscellaneous sheet metal flashing installed in conjunction with the roof system (not exposed to view) shall be 24 gauge paint-grip galvanized steel (unless otherwise indicated/specified) fully cleated to resist wind uplift and peel-off.
- B. Roof Drains and plumbing vents extending through the EPDM roof system shall be flashed in accordance with manufactures Requirements.
- C. Copings and Edge Metal: Provide style and profile as indicated on the drawings. As a minimum, provide gauge as recommended by SMACNA for the girth of the installed metal. Corners and intersections shall be shop fabricated and shop welded. Finish shall be smooth surface and Kynar 500 full strength Fluoropolymer, color(s) as selected by Architect from manufacturer's standard color selections.
- D. Gas and Fluid-Bearing Pipe Flashings: Gas and fluid-bearing pipe flashings shall be accomplished by fabricating and installing "pipe projection boxes", constructed using wood curbs, flashing sleeves with rain shields, draw bands and sealant. Construction shall be as recommended by the National Roofing Contractors Association and Sheet Metal and Air Conditioning Contractors Association. This type construction shall also be used at all pipe supports and other penetrations. Material thickness shall be as required by the girth dimension in accordance with SMACNA.
- E. Strippable film required on all prefinished items, including soffit panels and flashings. There will be no exceptions to this requirement.
- F. Prefinished Gutters and Downspouts: Provide thickness of material as required by SMACNA for the girth of the gutters and downspouts. Gutters and downspouts shall be prefinished galvanized steel of the profile detailed. Finish shall be full-strength Kynar 500, color(s) as selected by Architect from manufacturer's standard color selections. Provide prefinished hot-dipped galvanized, color coordinated, galvanized steel support straps for anchorage of gutters and downspouts to structure.
- G. Accessories:
 - 1. Washers, nails and screws, type suited to material being attached.
 - 2. Flashing adhesive compatible with the roof membrane and suitable for the intended application.
 - 3. Reglets: 24 Gauge galvanized steel similar to Fry Reglet Corporation of Alhambra, California. Provide type and profile required for the installation requirements and the substrate involved.
 - 4. Roof Expansion Joint Fillers and Covers: Provide styles and systems to suit project conditions as detailed on drawings.

PART 3 - EXECUTION

3.01 FABRICATION

- A. Form sheet metal items in bending brake. Pre-form in shop where practical. Install with care to assure clean, true and even lines.
- B. Make all joints watertight.
- C. Fabricate sheet metal items in maximum 10' lengths, with straight runs maximum 20' long, joining pieces with locked seams. Join units with loose-lock seams filled with sealants at expansion joints and Overlapping seams with necessary butyl mastic sealants.

3.02 CONDITION OF SURFACES

- A. Check surfaces to which flashings and trim are to be applied. Verify whether surfaces are smooth, properly prepared and have adequate provisions for fastening metal into position.
- B. Surfaces to be covered with sheet metal shall be free from defects of every description. Clean off dirt, rubbish, other foreign materials before sheet metal work is started. Drive projecting nails flush.

3.03 INSTALLATION

- A. Exposed edge of all flashing shall be bent back at least 1/2". Cap Flashing shall lap over base flashing as shown on drawings. All flashing joints shall be 3" loose lock slip joints filled with sealants.
- B. Seams: All seams, except required welded seams, shall be loose lock seams. All seams shall be made in the direction of flow. Loose lock seams shall be loose flat lock seams and shall be completely filled with sealant. Seams shall conform to the following requirements:
 - 1. Plain Lap seams shall lap not less than 3".
 - 2. Cross Folded Seams: Where sheet metal is folded in one direction and then folded at right angles to the first fold, as for example the slip joint of base flashings, expansion joints and similar cross folded joints, the folded portion of the sheet metal at the cross fold shall be split and a patch of sheet metal shall be welded over the split to avoid binding at the cross fold.
- C. Roof Drain and Vent Pipe Flashing: Extend a minimum of 12" beyond the vent stack and/or roof drain on all sides. The top of the flashing shall be turned down inside the vent pipe, two (2) piece design. Comply with the requirements of the Copper Development Association, Inc. of New York, New York, for the particular installations.
- D. Reglets: Reglets shall have ends of each length form a lap slip joint. Reglets shall provide continuous grooves nominal 1/4" at throat, horizontal depth minimum of 1-1/8" with provision for anchoring upturned edge of flashing.
- E. Roof System Expansion Joint Covers: Comply with manufactures' requirements for installation. Flanges of the expansion joint shall be set in sealant. Fasten to wood blocking (vertical and horizontal) as 4" o.c. with neoprene grommeted nails as supplied by the expansion joint manufacturer. Counterflash where vertical flange occurs with membrane flashing, as project conditions require.

- F. Gutters and Downspouts:
 - 1. Gutters: Install 7" continuous gutters up to 30 feet max. Support gutters using specified support brackets spaces at 18" o.c. Anchor to wall using non-corrosive, non-bleeding anchors.
 - 2. Downspouts: Install 4"x5" downspouts to terminate as shown on drawings. Support downspouts using specified anchor straps spaces at 48" o.c. Anchor to walls using non-corrosive, non-bleeding anchors. Factory fabricated with factory elbow and fittings.
- G. Electrolysis: All sheet metal subject to electrolysis action shall be fully protected by approved insulating coatings against dissimilar metals.
- F. All flashing and related metal work shall be installed in a manner to produce a neat appearance and shall be completely water-tight.

3.04 CLEANING AND PROTECTION

- A. Cleaning: After installation, all flashing shall be thoroughly cleaned and rinsed with potable water.
- B. Protection:
 - 1. Protect metal flashing from damage, stains, etc. during the progress of the Work. Damaged flashing shall be replaced prior to date of Substantial Completion at no additional expense to the Owner.
 - 2. Remove peel strip from prefinished materials just prior to Substantial Completion Inspection.

END OF SECTION

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Roof curbs.
- B. Pipe supports.
- C. Retro drains

1.02 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 07 60 00 – Flashing and Sheet Metal for manufactured fascia, copings, gravel stops, gutters and downspouts, and counterflashing.

1.03 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

1.05 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Warranty: Sample of special warranty.

1.06 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.07 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.08 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation and mill phosphatized for field painting where indicated.
 - 1. Exposed Coil-Coated Finish: Pre-painted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
 - 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- B. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- C. Steel Tube: ASTM A 500, round tube.
- D. Galvanized-Steel Tube: ASTM A 500, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- E. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.02 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or

chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

- C. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.03 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units with integral spring-type vibration isolators and capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Loads: As indicated on drawings.
- D. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch, 0.079 inch (2.01 mm) thick.
 - 1. Finish: Two-coat fluoropolymer, Baked enamel or powder coat.
 - 2. Color: As selected by Architect from manufacturer's full range.
- E. Construction:
 - 1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick glass-fiber board insulation.
 - 2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 - 3. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
 - 4. Fabricate curbs to minimum height of 12 inches above roof deck (300 mm) unless otherwise indicated.
 - 5. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
 - 6. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.

2.04 PIPE SUPPORTS

- A. Manufacturer: Pipe support systems shall be "Dura-Blok" by Eaton or "H-Block" by ASC

Engineered Solutions.

1. Curb base must be made of 100% recycled rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support*. In addition, each base to have a reflective red stripe.
2. 6" wide with steel frame.
3. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
4. Performance:
 - a. Density: 0.52 oz/cu in ASTM D575
 - b. Durometer Hardness: 67.2A ± 1 ASTM D575
 - c. Tensile Strength: 231 psi minimum ASTM D575
 - d. Compression Deformation: 5% at 70psi and 72°F ASTM D395
 - e. Brittleness at Low Temp: -50°F ASTM D746
 - f. Weathering: 70 hours at 120°F ASTM D573
 1. Hardness retained: 100% (±5%)
 2. Compressive strength: 100% (±5%)
 3. Tensile strength: 100% (±5%)
 4. Elongation retained: 100% (±5%)

2.05 RETRO DRAINS

- A. Manufacturer: Hercules RetroDrain by OMG, Inc.
 1. Size: varies across roof – field verify
 2. Compliance:
 - a. ANSI/SPRI RD-1.
 - b. ULC/ORD-C790.4.
 3. Drain Body:
 - a. Material: 1-piece, 11-gauge (0.125-inch) spun aluminum.
 - b. Flange: 17-1/2-inch diameter.
 - c. Drain Stem Length: 12 inches
 - d. Flange Includes: Six 2-1/2-inch-long aluminum studs.
 - e. Sump Area: Depressed.
 4. Strainer Dome:
 - a. Material: Cast aluminum.
 - b. Height: 7.25 inches.
 - c. Outside Base Diameter: 9.77 inches.
 5. Clamping Ring:
 - a. Material: Cast aluminum.
 - b. Gravel Stop Height: 1.2 inches.
 - c. Drainage Slots: 18 V-shaped.
 - d. Bosses: 6, to accept studs on flange.
 6. Backflow Seal:
 - a. Compression Seal: Watertight, "U-Flow" mechanical seal.
 - b. Material: Polyamide and EPDM rubber.
 - c. Required for Activation: "U-Flow" screwdriver.
 7. Hardware:
 - a. Locknuts: 6, stainless steel, for studs.
 - b. Screws: 3, stainless steel, to attach strainer to clamping ring.

2.06 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the

range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces or by other permanent separation as recommended by manufacturer.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Pipe Supports: Gas pipe spacing subject to local gas authorities. Use properly sized clamps to suit pipe [conduit] sizes.
- E. Retro Drains:
 - 1. Examine existing roof drains to receive retrofit roof drains and Notify Architect of conditions that would adversely affect installation or subsequent use.
 - 2. Remove clamping ring, strainer dome, and bolts from existing roof drain assembly and discard. Clean existing drain leader pipe of bitumen, dirt, and debris.
 - 3. Ensure drain lines are clear and flowing.

- A. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.02 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 72 33

ROOF HATCH

PART 1 - GENERAL

1.01 SCOPE

- A. This contractor shall furnish all labor and materials and perform all work required for the complete installation of the roof hatch.

1.02 SUBMITTALS

- A. Submit copies of shop drawings and complete technical data to the Architect for approval.

1.03 GUARANTEE

- A. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products. The installation of the roof hatch shall be watertight. The guarantee required under Section 07 53 23 and 07 60 00 of these specifications shall include all flashing installed in conjunction with the roof hatch specified in the Section.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Roof Hatch shall be a pre-manufactured, single leaf, ladder access hatch with 12" curb. Acceptable Manufacturers, subject to compliance with requirements of the Contract Documents, are as follows or approved equal.
 - 1. Bilco, Type S
 - 2. Precision Ladders, LLC
 - 3. Milcor, Single Leaf Series
- B. Type:
 - 1. Basis-of-Design:
 - a. 36" x 30" Type 'S' Roof Hatch by Bilco Company. Hing side 30"
 - b. 48" x 36" Type "SS-20" Roof hatch by Bilco Company. Hinge side 48"
 - c. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
 - 2. Performance characteristics:
 - a. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m²) with a maximum deflection of 1/150th of the span and a maximum design pressure of +/- 100 PSF (488 kg/m²) with a design factor of 2 for galvanized steel (Type S-20) roof hatches.
 - b. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 - c. Operation of the cover shall not be affected by temperature.
 - d. Entire hatch shall be weather tight with fully welded corner joints on cover and curb.

- e. Galvanized steel (Type S-20) roof hatches shall have a valid Notice of Acceptance (NOA) by Miami-Dade County Product Control Section. The hatches shall have product approval (FL) by Florida Building Council regarding compliance to Florida Building Code.
 - 3. Cover: Shall be 14 gauge (1.9mm) galvanized steel with a 3" (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
 - 4. Cover insulation: Shall be fiberglass of 1" (25mm) thickness, fully covered and protected by a metal liner 22 gauge (.8mm) galvanized steel.
 - 5. Curb: Shall be 12" (305mm) in height and of 14 gauge (1.9mm) galvanized steel. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" (11.1mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.
 - 6. Curb insulation: Shall be rigid, high-density fiberboard of 1" (25mm) thickness on outside of curb
 - 7. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe for steel construction: through bolted to the curb assembly.
 - 8. Hardware
 - a. Heavy pintle hinges shall be provided
 - b. Cover shall be equipped with a spring latch with interior and exterior turn handles
 - c. Roof hatch shall be equipped with interior and exterior padlock hasps.
 - d. The latch strike shall be a stamped component bolted to the curb assembly.
 - e. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" (25mm) diameter red vinyl grip handle to permit easy release for closing.
 - f. All hardware shall be zinc plated and chromate sealed.
 - g. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
 - 9. Finishes: Factory finish shall be alkyd based red oxide primed steel.
- C. Existing Pad locks belong to the Owner and should be removed prior to demolition and turned over to the Physical Plant Manager.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor's attention is called to Section 07 54 00, Membrane Roofing; and Section 07 60 00, Flashing and Sheet Metal. The roof hatch shall be installed in conjunction with these referenced Sections.
- B. Prior to the application of the base ply of the roof system, bolt the roof scuttle to the wood blocking at the prepared openings. The perimeter of the roof hatch shall be flashed and sealed by the roof system incorporating flashing and bonding adhesive furnished by the roof manufacturer. Completed flashing and sealing of the roof hatch shall be as recommended by the roofing manufacturer and shall be weatherproof.

- C. Verify that other trades with related work are complete before installing the roof hatch. Mounting surfaces shall be straight and secure. Verify that the substrate is dry, clean, and free of foreign matter.
- D. Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

3.02 ADJUSTING AND CLEANING

- A. Apply protective coating to separate aluminum from incompatible materials.
- B. Adjust movable parts for smooth operation. Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.
- C. Clean exposed surfaces per manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION

SECTION 07 92 00
SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of the sealants of the sealants, joint backing and caulking; Pre-compressed foam control joints in masonry.

1.02 RELATED SECTIONS

- A. Division 7 – Thermal and Moisture Protection: Installation of sealant at all roofing systems details and existing equipment flashing details.
- B. Section 09 91 00 – Painting: Installation of caulk on paintable surfaces.

1.03 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2017.
- B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2019.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2020.
- E. ASTM D1667 - Standard Specification for Flexible Cellular Materials—Poly (Vinyl Chloride) Foam (Closed-Cell); 2017.

ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for concrete Pavements; 2016.
- F. H. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; current edition.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.04 QUALITY ASSURANCE

- A. Acceptable manufacturers: Manufacturers shall be specified herein. Other manufacturers are acceptable subject to compliance with project requirements.
- B. Before purchase of each required material, the Contractor shall confirm its compatibility with each other material to which it will be applied in the joint system.
- C. Single Source Responsibility: Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants. The Contractor shall confirm its compatibility with each other material to which it will be applied in the joint system.

- D. Low VOC options of all materials shall be installed. VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- E. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 15 years documented experience.
- F. Applicator Qualifications: Company specializing in performing the work of this section with minimum 10 years of experience and approved by manufacturer.

1.05 SUBMITTALS

- A. Submit copies of complete technical data and physical samples to the Designer in accordance with Section 01 33 00.
- B. Submit a detailed list of all locations where materials will be used, type of caulking or sealants which will be used at each location and names of all manufacturers of compounds, primers and fillers which will be used.
 - 1. Product Data: Provide data indicating sealant chemical characteristics.
 - 2. Samples: Submit one sample, of each material 6 inches x 3/4 inches in size illustrating sealant colors for selection.
 - 3. Submit comprehensive color selections for ALL proposed sealants.
 - 4. Shop Drawings: Submit shop drawings for pre-compressed foam joints showing all joint splices, joint sizes and anticipated movement.
 - 5. Manufacturer's Installation Instructions: Indicate special procedures.
 - 6. Warranty: Submit manufacturer "Intent to Warrant Statement" including compatibility of products to be installed and completed Warranty forms completed in Owner's name and registered with manufacturer.
 - 7. Statement of compliance from Manufacturer's Technical Field Representative.

1.06 JOB CONDITIONS

- A. Copies of all technical bulletins relating to the installations of the various materials shall be on the job site at all times during the installation of all caulking and sealants. Workmen will be thoroughly familiar with these and the instructions therein shall be followed exactly.
- B. Deliver materials to the job site in original, unopened containers. Materials are to be stored in a protected area between 40 - 80 degrees F.
- C. Do not retain on the job site any material which has exceeded the shelf life recommended by its manufacturer.
- D. Protect all surfaces from staining or damage. All damaged work shall be repaired or replaced as directed by the consultant and at no additional cost to the Owner.

1.07 WEATHER CONDITIONS:

- A. Do not proceed with installation of sealants under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for

installation.

- B. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.
- C. Whenever joint width is affected by ambient temperature variations, install sealants only when temperatures are in the lower third of manufacturer's recommended installation temperature range.

1.08 WARRANTY

- A. See Section 01 78 21 - Closeout Submittals, for additional warranty requirements.
- B. Installer Warranty: Correct defective work within a five year period after Date of Substantial Completion.
- C. Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants and accessories to repair or replace those that demonstrate deterioration or adhesive or cohesive failure, or do not cure under normal use within warranty period specified.
 - 1. Installed material - 5 years.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Colors: For concealed material provide any of manufacturer's standard colors; for exposed material provide manufacturer's standard colors as selected by the Designer, unless otherwise indicated.
- B. Roofing Sealant: Reference Roofing specifications for all approved and compatible sealants. System shall be under one warranty.
- C. Masonry Control Joints: Provide one-part, medium-modulus neutral-cure adhesive/sealant silicone material, color to be selected by Architect; Dow DOWSIL 795 Silicone Building Sealant.
- D. Exterior Exposed Joints where bond substrates are porous (i.e., Concrete, Masonry, Cement, etc.)
 - 1. Provide two-part gun-grade polyurethane sealant in custom color to be selected by Designer; Urethane, M, NS, 50, T, NT: Multicomponent, non-sag, plus 50 percent and minus 50 percent movement capability, traffic- and non-traffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 50, Uses T and NT.: Percora "Dynatrol II", Bostik "Chem-Calk 500" or
 - 2. One-part, moisture-curing, gun-grade polyurethane sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.: Tremco "Vulkem 116", BASF "MasterSeal NP-1".
- E. Exterior Exposed Joints of Nonporous Substrates (i.e., Glass, Metals, etc.): Provide one part silicone sealant; G.E. "SCS1200", Dow Corning "732/999 Building Sealant", or Bostik "Chem-Calk 1200". Single-component, non-sag, plus 100 percent and minus 50 percent movement capability, non-traffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
- F. Exterior Concealed Joints: Provide butyl rubber base sealant; DAP "Butyl-Flex", Tremco "Butyl Sealant", or Bostik Products "Chem-Calk 300".

- G. Joints at Floor or Paved Surfaces and Expansion Joints of Tiles and Pavers: Provide one part polyurethane sealant: Tremco “Vulkem 45SSL”, BASF “MasterSeal SL2”, or Bostik “Chem-Calk 550”.
- H. Solvents, primer and cleaning agents shall be as recommended by the sealant/caulking manufacturers.
- I. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb./cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.
- J. Back-up materials for sealants and caulking shall be closed cell polyethylene or other expandable non-staining filler, as recommended by and compatible with the sealant manufacturer. Back-up materials shall have a diameter of approximately 25% to 50% greater than the width of the joint.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Caulking and sealants shall be applied in strict accordance with the manufacturer's instructions.
- B. Prior to the installation of any caulking or sealant, all surfaces and joints must be completely clean, dry and free from any dust or loose particles. Clean first with brush and dry cloth and then clean with an air brush using dry, oil-free air. Immediately after cleaning, prime, as required, the surfaces to be treated with the appropriate primer using a small clean paint brush reaching all parts of the area to be primed. Where primer is required, allow sufficient drying time before applying sealant.
- C. Inspect the work of other trades prior to installation of caulking and sealants. Install no caulking or sealant in joints which are not in proper condition to receive sealant materials until defects are corrected.
- D. All caulking and sealants shall be installed with guns having the proper size nozzles. Caulking and sealants shall be installed in uniform, continuous ribbons and shall fill all voids and joints solid. Every caulked joint shall be airtight. Every sealed joint shall be airtight and watertight. Joints in masonry and other areas of the building shall be slightly convex. Joints to be painted shall be even and smooth.
- E. Prime or seal the joint surfaces. Do not allow primer/sealer to spill or migrate onto adjoining surfaces. All anodized aluminum surfaces to receive sealant shall be primed with a primer recommended by the sealant manufacturer, unless sealant manufacturer certifies, in writing, that primer is not required.
- F. Install sealant backer rod for elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown or backed by other solid substrate. Back-up material shall be installed in joints deeper than 1/2 inch. Back-up material shall be set for approximately 3/8 inch depth of compound.
- G. Install bond breaker tape wherever backer rod is not used and wherever required by

- manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- H. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides.
 - I. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between horizontal surface and a vertical surface, fill joint to form a slight cove so that joint will not trap moisture and dirt.
 - J. Unless specifically dimensioned on Drawings, install sealants to depths recommended by the sealant manufacturer, but within the following general limitations:
 - 1. For walkways and floors and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of the joint width, but not more than $\frac{3}{4}$ inch deep or less than $\frac{3}{8}$ inch deep.
 - 2. Normal moving of joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but not more than $\frac{1}{2}$ inch deep or less than $\frac{1}{4}$ inch deep.
 - K. Do not allow sealants to overflow or spill onto adjoining surfaces or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
 - L. In exterior work where sealant tape is used, provide cap sealant bead of the specified silicone sealant.
 - M. Cure sealants in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength, and surface durability.
 - N. Caulking that is to be painted shall be installed before the last coat of paint is applied.
 - O. Apply sealants and caulking when temperatures are as recommended by the manufacturers. Storage of all material shall be at room temperature with material being used on a first in, first out basis.
 - P. Caulking and sealants application shall include, but is not limited to the following:
 - 1. Joints in building facade.
 - 2. Control joints and expansion joints, as detailed and as required for a weathertight structure.
 - 3. Joints in walk and slabs and all other traffic bearing surfaces where shown on drawings.
 - 4. Between dissimilar materials.
 - 5. Perimeter of storefronts and windows.
 - 6. At areas to prevent the entrance of moisture.
 - 7. Other areas as detailed on the drawings.
 - Q. Sealant to be installed over horizontal expansion joints shall be installed after area is cleaned and primed as outlined above. After compound is properly mixed, pour into joints using a small spouted oil type can. Sealant shall not be poured from the can in which it has been mixed. Fill in joints in a manner to avoid air voids. Bring to a level, even joint, slightly below the top of the paving. Minimum depth of the joint shall be $\frac{1}{2}$

inch, unless specified or detailed otherwise.

- R. Coordinate installation of sealant with application of clear masonry sealer.
- S. Joints to be painted shall be even and smooth. Caulking that is to be painted shall be installed before the last coat of paint is applied.

3.02 CLEANING

- A. Upon completion of the work, all excess materials shall be removed leaving joints neat, clean and straight. Any cured material shall be removed by cutting with a sharp-edged tool. Thin films may be removed by abrading, but without damaging the finish of any other materials.

END OF SECTION

SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL

1.01 SUMMARY

- A. The Conditions of the Contract, and all Sections of Division 1, are hereby made a part of this Section.
- B. Section Includes: Factory glazed windows complete with reinforcing, shims, anchors, and attachment devices.
- C. Related Sections:
 - 1. Division 7 Section "Joint Sealants."
 - 2. Division 8 Section "Glass and Glazing."
- D. Coordinate work with that of all construction contractors affecting or affected by work of this Contract. Cooperate with such contractors to assure the steady progress of the Work.
- E. Conduct field testing of windows when specified in Division 1 by an independent lab using AAMA field test procedures.

1.02 SYSTEM DESCRIPTION

- A. General: In addition to requirements shown or specified comply with sitelines and profiles indicated on contract documents.
- B. Window Replacement Requirements:
 - 1. Work Included: Provide labor, materials and equipment necessary to complete the work of the Replacement Window Contract, and without limiting the generality there of include:
 - 2. Removal of existing sash, fixed glazing, frames and other accessories as required by the proposed replacement system.
 - 3. Removal of other existing work as required for the proper installation and operation of the new units.
 - 4. Removal from site and legal disposal of all removed materials, debris, packaging, banding and all other surplus materials and equipment.
 - 5. Provide new factory glazed, thermally broken, aluminum windows, types as specified herein, together with necessary mullions, panning, trim, expanders, operating hardware, installation hardware and all other accessories as required.
 - 6. Insulated panels and frames as required in selected transoms and other locations.
 - 7. Treated wood blocking, fillers and nailers as required for secure installation. Bidders shall survey conditions of existing sills and jambs prior to bidding. Contractor shall be responsible for providing new blocking for portions of same that are deteriorated.
 - 8. Fiberglass insulation between window frames and adjacent construction where applicable.
 - 9. Sealing of all joints within each window assembly.
 - 10. Sealing of entire exterior perimeter of window units after installation.
 - 11. Field observations and measurements of existing openings and conditions.
 - 12. Furnishing and delivering of extra materials as specified.
- C. Design Requirements:

1. Manufacturer/subcontractor is responsible for designing system, including installation instructions and necessary modifications to meet specified requirements and maintain visual design concepts.
 2. Requirements shown by details are intended specifically to establish dimension of unit, sight lines and profiles of members.
 3. Provide assemblies free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
 4. Installation instructions are to take into account specified site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
 5. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.
 6. Evacuate water without infiltration to interior from exterior face of wall, water entering joints, and condensation occurring within windows, by drain holes and gutters of adequate size or other acceptable method.
 7. Provide concealed fastening wherever possible.
- D. Performance Requirements: Requirements for aluminum windows, terminology and standards of performance, and fabrication and workmanship are those specified and recommended in AAMA/WDMA/CSA 101/I.S.2/A440-08 and applicable general recommendations published by AAMA. Conform to more stringent of specified AAMA standards and following:
1. Performance Class and Grade: CW-PG110
 2. Air Infiltration Test: Not exceed 0.10 cubic feet per minute per square foot when tested at a pressure of 6.24 psf. Perform tests in accordance with ASTM E 283 with the sash in a closed and locked position.
 3. Water Resistance Test: Subject window unit to a water resistance test in accordance with ASTM E 331 and E547 with no water passing the interior face of the window frame and no leakage as defined in the test method. Mount the glazed unit in its vertical position continuously supported around the perimeter and the sash placed in the fully closed and locked position. When a static pressure of 12 pounds per square foot has been stabilized, apply five gallons of water per square foot of window area to the exterior face of the unit for a period of 15 minutes.
 4. Uniform Load Deflection Test: ASTM E 330 at 110 pounds per square foot: No member deflection more than 1/175 of its span. Maintain test load for a period of 10 seconds resulting in no glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms or any other damage causing the window to be inoperable.
 5. Uniform Load Structural Test: Apply a minimum exterior and interior uniform load of 165 pounds per square foot to the entire outside surface of the test unit. Maintain this test load for a period of 10 seconds. Results: No glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms, or any other damage causing the window to be inoperable. And no permanent deformation of any frame or vent member in excess of 0.2 percent of its span.
 6. Life Cycle Test: Per AAMA 101 and AAMA 910, provide proof that the product meets the criteria including passing air and water tests at the conclusion of the cycle tests.
 7. "U" Factor: Perform computer simulation in accordance with ANSI/NFRC 100-2017 on a 1200mm (47") x 1500 mm (59") maximum size window resulting in a whole window U-Factor of no more than 0.33 using soft coat low-E insulating glass, argon and a warm edge spacer.
 8. Testing: Where manufacturer's standard window units comply with the above performance requirements and have been tested by an AAMA certified independent laboratory showing compliance with such tests. Submit copy of the test report for the operable vent windows signed by the independent laboratory.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, recommendations and standard details for aluminum window units.
- B. Shop Drawings: Submit shop drawings, including location floor plans or exterior wall elevations showing all window openings, typical unit elevations at 1/4 inch scale, and half size detail sections of every typical composite member. Show anchors, hardware, operators and other components as appropriate if not included in manufacturer's standard data. Include glazing details and standards for factory glazed units.
- C. Samples:
 - 1. Submit one sample of each required aluminum finish, on 3 x 3 inch long sections of extrusion shapes or aluminum sheets as required for window units.
 - 2. Submit additional samples, if and as directed by Architect, to show fabrication techniques, workmanship of component parts, and design of hardware and other exposed auxiliary items.
- D. Certifications: Submit certified test laboratory reports by independent laboratory substantiating performance of system. Include other supportive data as required or as necessary.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store and handle windows, mullions, panels, hardware and all pertinent items in strict compliance with the manufacturer's instructions.
- B. Protect units adequately against damage from the elements, construction activities and other hazards before, during and after installation.

1.05 WARRANTY

- A. Provide Manufacturer's Warrantees: Submit written warrantees from window manufacturer for the following:
 - 1. Windows: Windows furnished are certified as fully warranted against any defects in material or workmanship under normal use and service for a period of one (1) year from date of fabrication.
 - 2. Finish: The pigmented organic finishes on exposed surfaces of windows and component parts (such as panning, trim, mullions and the like) are certified as complying fully with requirements of AAMA 2604 for pigmented organic coating and fully warranted against chipping, peeling, cracking or blistering and fading for a period of ten (10) years from date of installation.
 - 3. Insulated Glass: Warranted from visual obstruction due to internal moisture for a period of twenty (20) years.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Aluminum "Steel Replica" Windows, Basis of Design: Series SR6700 fixed window as manufactured by Graham Architectural Products, York, PA., utilizing profiles as indicated on bid documents.
- B. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire

perimeter of the frame and all sash and not be bridged by any metal conductors at any point. Provide manufacturer's standard construction which has been in use on similar window units for a period of not less than three years, has been tested to demonstrate resistance to thermal conductance and condensation and has been tested to show adequate strength per AAMA 505.

2.02 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance and application of required finish, but not less than 22,000 psi ultimate tensile strength, a yield of 16,000 psi. Comply with ASTM B 221.
- B. Fasteners: Aluminum, stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.
 - 1. Do not use exposed fasteners on exterior except where unavoidable for application of hardware. Match finish of adjoining metal.
 - 2. Provide non-magnetic stainless steel, tamper-proof screws for exposed fasteners, where required, or special tamper-proof fasteners.
 - 3. Locate fasteners so as not to disturb the thermal barrier construction of windows.
- C. Anchors, Clips And Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel or hot-dip zinc coated steel or iron complying with ASTM A 123.
- D. Compression Glazing Strips and Weatherstripping: At manufacturer's option, provide neoprene gaskets complying with ASTM D 2000 Designation 2BC415 to 3BC415, PVC gaskets complying with ASTM D2287, or expanded neoprene gaskets complying with ASTM C 509, Grade 4.
- E. Sealant:
 - 1. Unless otherwise indicated for sealants required within fabricated window units, provide elastomeric type as recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Provide product complying with AAMA Specification 803 and 808.
 - 2. Refer to Division 7 for perimeter sealants between window units and surrounding construction.

2.03 WINDOW TYPES

- A. Fixed Aluminum Windows or Panel Frames (F):
 - 1. Minimum Frame Depth: 3.250 inches.

2.04 FABRICATION & ACCESSORIES

- A. General: Provide manufacturer's standard fabrication and accessories which comply with specifications. Include complete system for assembly of components and anchorage of window units and provide complete pre-glazing at the factory.
- B. Window Material:
 - 1. Windows and Muntin Bars: Aluminum.
 - 2. Secondary Members (friction tabs, shoes, weatherstripping guides, etc.): Aluminum or a material compatible with aluminum.
 - 3. Color and Finish to be selected by Architect during submittal process.
- C. Master Frame: Not less than 3.250 inches in depth.

- D. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire perimeter of the frame and all sash and shall not be bridged by any metal conductors at any point.
- E. Construction:
 - 1. Assembly: Miter and seal vents with a non-hardening mastic, forming a watertight joint. Structurally reinforce corners of the vent with aluminum gusset blocks and chemically weld, followed by crimping. Mechanical fasteners are not allowed.
 - 2. Cope corners of the frame with two screws per corner into screw ports and back seal, forming a water-tight joint.
- F. Mullions - Other structural members: When mullion units occur, whether they are joined by integral mullions, independent mullions or by a combination of frame members, the resulting members must be capable of withstanding the load outlined under Uniform Load specified load requirements, without deflecting more than 1/175th of its span. When independent or integral mullions are used to join windows, the mullions shall contain a thermal barrier as specified. Sightline shall provided match to existing sightlines. Evidence of compliance may be by mathematical calculations.
- G. Weather Protection:
 - 1. Provide means of drainage for water and condensation which may accumulate in members of window units by use of two weeps per main frame member.
 - 2. Do not position other material in such a manner as to obstruct the weep holes function.
- H. Simulated True Muntin: The simulated muntin is a triple muntin system to simulate a true muntin appearance from exterior. Align muntins within the windows system and from window to window within an industry acceptable tolerance.
 - 1. Interior Grid: 1.125" x 0.062" aluminum bar or profile grid as applicable, finish to match window system.

PART 3 - EXECUTION

3.01 PREPERATION

- A. Existing Construction:
 - 1. Do not remove existing windows until new replacements are available and ready for immediate installation. Do not leave any openings uncovered at end of working day, during wind-driven precipitation or during excessively cold weather.
 - 2. Remove existing work carefully; avoid damage to existing work to remain.
- B. Perform operations as necessary to prepare openings for proper installation and operation of new retrofit units or new construction units.
- C. Verify openings are in accordance with shop drawings and Architects Drawings.

3.02 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators and other components of work. In no case shall attachment to structure or to components of the window system be through or affect the thermal barriers of the window units.
- B. Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor

securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.

- C. Wedge fiberglass insulation between frames of new windows and construction to remain, or between frames and new receptor as applicable. Compress fiberglass to no less than 50 percent of original thickness.
- D. Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown, to provide weathertight construction. Seal units following installation and as required to provide weathertight system.

3.03 ADJUST AND CLEANING

- A. Adjust operating vent and hardware to provide tight fit at contact points and at weatherstripping, for smooth operation and weathertight closure.
- B. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and moving parts.
- C. Clean glass promptly after installation of windows. Remove glazing and sealant compound, dirt and other substances.

3.04 PROTECTION

- A. Initiate all protection and other precautions required to ensure that window units will be without damage or deterioration (other than normal weathering) at time of acceptance.
- B. Send written recommendations for maintenance and protection of windows following Substantial Completion of Window Contract.

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes but is not limited to the following:
 - 1. Insulating glass in aluminum framed windows.
 - 2. All accessories required for complete glazing.

1.02 RELATED SECTIONS

- A. Section 08 51 13 - Aluminum Windows: Insulating glass installed in aluminum framing system.

1.03 QUALITY ASSURANCE

- A. Inspection of Glass Insulating Glass Units during Fabrication: Quality control shall be established for washing, assembly and packaging stages of production. Units shall be inspected for primary seal continuity, sight-line consistency and foreign material sealed in lite.
- B. Glass Quality Standards:
 - 1. Tempered Glass: ¼", Condition A (uncoated surfaces), Type I (transparent glass, flat), Class I (clear), Quality q3, clear, fully tempered safety glass (meet requirements of ANSI Z97.1). Tempered glass shall bear permanent monogram indicating tempered quality. Fabrication marks on tempered glass shall be located to be concealed in completed installation.
 - 2. Wire Glass: Type II, Class I (translucent), Quality q8 (glazing), complying with ANSI Z97.1, ¼" thick; Form I (wire, polished both sides), mesh M2 (square).
 - 3. Insulating glass shall meet the requirements of the Sealed Insulating Glass manufacturers Association (SIGMA) for construction and insulating value and SIGMA "Specification for Sealed Insulating Glass Units".
 - 4. Clear Float Glass: Type I (transparent glass, flat), Class I (clear), Quality q3 (glazing select).

1.04 SUBMITTALS

- A. Submit copies of technical data and shop drawings on items specified herein to the Architect in accordance with Section 01 33 00. Reference shall be made to locations of glass installations.
- B. One (1) 12"x12" sample of each type and thickness of glass shall be submitted for review.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All glass and related materials shall arrive at the job site properly packed and crated and marked to agree with the approved shop drawings and bearing factory labels on each pane. Labels shall not be removed until final inspection.
- B. Store material under cover on wood runners on floors in an upright position and in a manner that will prevent damage.

1.06 GUARANTEE

- A. Provide manufacturer's standard 10-year warranty protecting insulating glass against failure of seal. Replace glass (material and labor) units failing to perform during this warranty period at no cost to the Owner. Date of warranty shall commence at the Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
 1. (Vitro Architectural Glass) PPG Industries, Inc.
 2. Guardian Industries.
 3. Pilkington Group

2.02 MATERIALS

- A. Interior view windows: Clear annealed float glass complying with ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Insulating Glass: 1" Insulating glass. Provide fully tempered glass assemblies at locations as required by Tennessee Safety Glazing Act and local codes and ordinances.
 1. Solarban 60 – Solar Control Low-E Glass; Color selection to be determined by Architect during submittal process.
- C. Accessories:
 1. Glazing tape shall be equal to Tremco Polyshim, as manufactured by Tremco of Cleveland, Ohio.
 2. Glazing sealant shall be equal to Spectrem 2, as manufactured by Tremco of Cleveland, Ohio.
 3. Neoprene setting blocks shall have a Shore "A" hardness of 70-90 and be chemically compatible with any sealant used.

2.03 ACCESSORIES

- A. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- B. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- C. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- D. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
 1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
 2. Color: Black
 3. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-

- sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
4. Color: Matching structural sealant.

PART 3 - EXECUTION

3.01 GENERAL

- A. Protect glass from damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.
- B. Watertight and airtight installation of each glass product is required.
- C. Cutting or altering lites of tempered or insulating glass in field is prohibited.

3.02 INSTALLATION

- A. Door View Lite Glazing: Glaze using polyvinylchloride tape applied to both sides, all stops. Place tape with butted joints. Compress tape approximately 30%. Center glazing material in rabbet. Support glass all around with neoprene setting blocks, with no metal-to-glass contact. Draw up glazing beads with equal pressure all around. Position bug or hallmark on unit so final position in framed opening occurs consistently in lower right hand corner of unit, parallel to bottom of door in inconspicuous location.
- B. Tempered Glass: Position bug or hallmark on unit so final position in framed opening occurs consistently in lower right hand corner of unit, parallel to floor in inconspicuous location.
- C. Wire Glass: Install in opening in accord with manufacturer's installation instructions to conform to labeling requirements; use special supplied caulking materials.

3.03 PROTECTION AND CLEANING

- A. After all construction has been completed and prior to Substantial Completion inspection and the possibility of glass breakage has been reduced to a minimum, remove all labels. Wash and polish glass on both faces, removing all paint, smears and spots. Glass broken or damaged before the Substantial Completion shall be replaced with glass of a like kind and quality at no expense to the Owner.
- B. Remove all excess materials and debris from the project site.

END OF SECTION

SECTION 09 91 00

PAINTING - GENERAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes furnishing and application of painting materials to surfaces, including:
 - 1. Surface preparation of surfaces to be painted.
 - 2. Touching up of prime coats and other preparation necessary prior to finish painting.
 - 3. Painting, staining and otherwise finishing of new surfaces as indicated/scheduled on the Drawings and specified in this and other Sections of this Project Manual.
- B. "Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- C. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors or materials are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these colors from standard colors or finishes available.

1.02 RELATED SECTIONS

- A. Section 07 92 00 - Sealants and Caulking: Coordination of sealant and caulking installation with application of paint.

1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers - The following manufacturers are acceptable for use on this project subject to compliance with requirements:
 - 1. Farrell-Calhoun, Inc. of Memphis, Tennessee.
 - 2. Sherwin-Williams Company of Cleveland, Ohio.
 - 3. Benjamin Moore & Company of Montvale, New Jersey.
 - 4. PPG Porter Paints, Porter International of Louisville, Kentucky.
- B. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer and use only within recommended limits.
- C. Coordination of Work: Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings systems for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.
- D. Acceptable Surfaces: The paint contractor and General Contractor shall be solely responsible for determining that the wall is ready and suitable to be painted.
- E. Acceptance of Paint Application: Each coat of paint must be reviewed and accepted by the Architect before the succeeding coat of paint can be applied. Any coat of paint applied without this review will not be considered as painted.

1.04 SUBMITTALS

- A. Submit color chips and manufacturer's product data to the Architect for color selection and product review. Submittals shall include spread and coverage rate per coat.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver products and materials in original unbroken containers with legible labels intact bearing manufacturer's brand and name with application instructions printed thereon. Paint shall arrive on the job ready mixed, except for tinting of undercoats and possible thinning as recommended by manufacturer.

1.06 JOB CONDITIONS

- A. Inspection of Surfaces: The painting contractor shall be responsible for inspecting the work of others prior to the application of any paint or finishing material. If any surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding, and puttying operations, the painting contractor shall immediately notify the General Contractor in writing or assume responsibility for and rectify any unsatisfactory finish resulting.
- B. Environmental Requirements: Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied. Do not apply finish in areas where dust is being generated.
- C. Protection: All materials used on the job shall be stored in a single place designated by the Contractor. Such storage place shall be kept neat and clean. All damage to the storage area and its surroundings shall be repaired. Any soiled or used rags, waste and trash must be removed from the building every night, and every precaution taken to avoid the danger of fire.
- D. Protect surfaces and objects inside and outside the building, as well as the grounds, lawns, shrubbery, and adjacent properties against damage. The painting contractor shall hold himself responsible for damage to adjacent furnishings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All paint and primer applied in the field shall be the products of a single manufacturer. For the purpose of clarification, only the products of one manufacturer have been listed herein.
- B. Paint: The VOC concentrations of the product shall not exceed those listed below. The calculation of VOC shall exclude water and tinting color added at the point of sale. VOCs need to be confirmed by using the products MSDS sheets.

Exterior Coatings:

<u>Coating Type</u>	<u>VOC weight in grams/liter of product minus water</u>
Non-flat	50
Flat	50
Primer, Sealer, Undercoat	100
Stain, Exterior	100
Low Solids*	120
Waterproofing: Concrete/Masonry	100
Industrial	100

Floor 50
 * Low Solids In g/L (grams per liter), not less water

- C. Primers: Where the manufacturer specifies products, the VOC limits follow the rules set forth above. These coatings are intended for on-site application to exterior surfaces of residential, commercial, institutional or industrial buildings.
- D. Extra Stock: Supply an extra 2% of total quantity of each paint used with a minimum of three (3) gallons of each paint. Furnish in manufacturer's unopened, labeled containers for Owner's use.

2.02 PAINTING SCHEDULE

- A. Exterior Painting Schedule:
 - 1. Galvanized Metal, Including Weather Exposed HVAC and Electrical Equipment:
 - a. First coat: Farrell-Calhoun #697 100% Acrylic Interior/Exterior Bonding Primer, DFT mils: 1.7.
 - b. Omit first coat on items where compatible factory primer has been applied.
 - c. Second and third coats: Farrell-Calhoun #8000 Line Waterborne 100% Acrylic DTM Enamel, DTF mils: 1.7 mils per coat.
 - 2. Ferrous Metals, Including Weather Exposed HVAC and Electrical Equipment:
 - a. First coat: Farrell-Calhoun #5-56 100% Acrylic All Purpose Metal Primer, DFT mils: 1.8 Omit first coat on items where compatible factory primer has been applied.
 - b. Second and third coats: Farrell-Calhoun #8000 Line Waterborne 100% Acrylic DTM Enamel, DTF mils: 1.7 mils per coat.
 - 3. Copper/Aluminum, Including Weather Exposed HVAC and Electrical Equipment:
 - a. First coat: Farrell-Calhoun #5-56 100% Acrylic All Purpose Metal Primer, DFT mils: 1.8
 - b. Second and third coats: Farrell-Calhoun #8000 Line Waterborne 100% Acrylic DTM Enamel, DTF mils: 1.7 mils per coat.
 - 4. Weather Exposed Ferrous Piping:
 - a. First coat: Farrell-Calhoun #1022 Tuff-Boy Rust-Stop White Primer, DFT mils: 2.0.
 - b. Second and Third coats: Farrell-Calhoun #1000 Tuff-Boy Interior/Exterior Chrome Finish Aluminum, DTF mils: 1.4 per coat.

PART 3 - EXECUTION

3.01 COOPERATION WITH OTHER TRADES

- A. This work shall be scheduled and coordinated with other trades and shall not proceed until other work and job conditions are as required to achieve satisfactory results.

3.02 GENERAL REQUIREMENTS

- A. Before starting any work, surfaces to receive paint finishes shall be examined carefully for defects which cannot be corrected by the procedures specified herein and which might prevent satisfactory painting results. Work shall not proceed until such damages are corrected.
- B. Secure approval of color samples before applying any paint or finish. All priming coats and undercoats shall be tinted to the approximate shade of the final coat.
- C. Start of painting shall be construed as acceptance of the surfaces to receive paint or

other finish.

- D. Surfaces to receive work described in this section shall be smooth, even, sound, thoroughly clean and dry and free of defects which would adversely affect application of this work. Surfaces which do not meet the tolerances or quality requirements imposed within the specifications governing substrate construction, shall be repaired or replaced prior to initiating this work.
- E. All materials shall be mixed, thinned, modified, and applied only as specified by the manufacturer's direction on the container.
- F. Application shall be sufficiently heavy to achieve pleasingly uniform color and lucid effect; matching approved sample.
- G. All coats shall be thoroughly dry before applying succeeding coats.
- H. Inspection of Coats: Notify the Architect for inspection between coats at least 24 hours in advance. The number of coats specified are intended to provide full coverage. Satisfactory coverage subject to the approval of the Architect. Additional coat or coats will be required by the Architect if these coats do not give sufficient coverage. Final coat shall match approved sample panel.
- I. Prior to the application of any paint, all surfaces shall be cleaned and inspected. Remove all dust and dirt and patch nail holes and dimples with vinyl paste spackling compound. Spackling compound will be brought flush with the adjoining surfaces and touch sanded to produce a smooth even surface.
- J. All wood to be painted will be touched up with shellac at knots and pitch streaks.
- K. Wood receiving the Spar Varnish finish shall be ribbed with steel wool to remove the high gloss finish to a low luster finish to be approved by Architect.
- L. Metal surfaces shall first be washed with a mineral spirit to remove any dirt or grease before applying materials. Where rust or scale is present, it shall be wire brushed, or sandpapered clean before painting. Shop coats of paint that become marred shall be cleaned and touched up with a similar primer. Galvanized metal surfaces shall be chemically treated with a compound designed for this purpose in accordance with manufacturer's directions for use before applying the first coat of paint. All metals exposed to view not prefinished shall be painted unless noted otherwise.
- M. The priming coat on all surfaces shall be tinted to the appropriate shade of the final coat and touched up before applying the second and third coats to provide an even finish. The Contractor will secure color schedules before priming. All coats shall be thoroughly dry before applying succeeding coats.
- N. All work, where a coat of material has been applied, must be thoroughly dry, and inspected and approved by the Architect before the application of the succeeding specified coats, otherwise no credit for the coat applied will be given, and the Contractor automatically assumes the responsibility to re-coat the work in question, The Contractor shall notify the Architect when a given area is ready to be inspected.
- O. No material will be applied over a damp surface. Exterior work shall not be performed during dusty, rainy or frosty weather. A temperature of 70 degrees Fahrenheit or more shall be maintained when enamel is being applied and 50 degrees Fahrenheit or more

during interior painting. Exterior painting will be performed when the air temperature is 50 degrees Fahrenheit or higher and in drying weather.

- P. Access doors or panels, electrical panelboard covers, ducts and raceways in finished areas shall be painted the same color as adjacent surfaces except where color coding is specified or as directed by Owner.
- Q. Paint all exposed piping safety yellow to be selected by Owner.
- R. All work shall be complete. When color, stain, dirt or undercoats show through the final coat of paint the work shall be covered by additional coats until the paint is uniform in color and appearance and coverage is complete to the satisfaction of the Architect.
- S. Paint all exposed surfaces of exterior mechanical equipment, two coats of exterior paint as specified in the painting schedule for exterior ferrous metals.
- T. The Contractor shall not only protect the painting work at all times, but shall also protect all adjacent work and materials by suitable coverings or other methods during progress of the work. Upon completion of the painting all paint spots shall be removed as outlined in the General Conditions. All rubbish and accumulated materials of any nature shall be removed from the job site leaving work in a clean, orderly and acceptable condition.

3.03 PREPARATION OF SURFACES

- A. General:
 - 1. Surfaces shall be clean, dry and adequately protected from dampness.
 - 2. Surfaces shall be smooth, even and true to plane.
 - 3. Surface shall be free of any foreign material which will adversely affect adhesion or appearance of applied coating.
 - 4. Remove all loose, spalling paint from previously painted surfaces utilizing wire brushes, pressure washing or mechanical means, as required to provide a smooth and sound substrate for the application of new paint.
 - 5. Mildew shall be removed and neutralized by scrubbing affected areas thoroughly with a solution made by adding two ounces of Tri-Sodium Phosphate and eight ounces of Sodium Hypochloride (Clorox) to one gallon warm water. Use a scouring powder if necessary, to remove mildew spores. Rinse with clear water and allow to dry before painting.
- B. Preparation of Ferrous Metal Surfaces:
 - 1. Remove rust, mill scale and defective paint down to sound surface or bare metal, using scraper, sandpaper, or wire brush as necessary. Grind if necessary, to remove shoulders at edge of sound paint to prevent flaws from photographing through finish coats.
 - 2. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
 - 3. Touch-up all bare metal and damaged shop coats with specified rust-inhibitive primer.
 - 4. Necessary touching up of shop primer shall be done on ferrous metal surfaces of all items installed adjacent to concrete prior to any openings between metal surface and adjacent surfaces being filled in or caulked.
- C. Preparation of Galvanized Metal Surfaces:
 - 1. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
 - 2. All galvanized steel surfaces shall be pre-treated with proprietary acid-bound resinous or crystalline zinc phosphate preparations used according to the

manufacturer's directions prior to painting.

- D. Preparation of Copper Surfaces:
1. Buff or polish surfaces to bright color.
 2. Remove dirt and grease from surface with a mild phosphoric acid. Wipe dry with clean cloths.
 3. Apply finish while surface is clean and bright.

3.04 APPLICATION

- A. General:
1. Protection of Adjacent Surfaces and Mixed Items:
 - a. The Contractor not only shall protect his work at all times but shall also protect all adjacent work and materials by drop cloth, covering or other methods during progress of his work.
 - b. Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items, or provide ample in-place protection. Upon completion of each space, carefully replace all removed items. This work shall be done only by skilled mechanics.
 - c. Remove electrical panel box covers and doors before painting wall. Paint separately and reinstall after paint is dry.
 2. The undercoats of paint and enamel shall be of approximate shade of the final coat. All metal surfaces calling for enamel or varnished finish shall first have priming coat well sanded and shall be sanded between coats with fine sandpaper or steel wool that will produce an even, smooth finish. Each coat shall be perfectly dry before applying succeeding coats.
 3. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer. Test with moisture meter. Exterior surfaces shall not be painted in damp, frosty, or cold weather. Latex paints shall not be applied when surface or air temperature is below 50°F.
 4. Surfaces shall be finished the same as nearest or adjoining surfaces unless otherwise shown.
 5. Exposed access doors or panels, exposed electric panelboard covers, exposed pipes, ducts and raceways shall be painted the same color as adjacent surfaces unless notified otherwise. All piping exposed in finished areas shall be painted as required for interior ferrous metal. Where galvanized pipe occurs, prime galvanized surface as specified.
 6. Hardware and accessories, fixtures and similar items placed prior to painting shall be removed or protected during painting, replaced on completion of painting.
 7. All weather exposed HVAC and electrical equipment shall be painted.

3.05 CLEANUP

- A. During progress of the work, keep areas free from any unnecessary accumulation of tools, equipment and surplus materials and debris.
- B. At completion of work, the painting contractor shall remove from the premises all surplus painting materials and all debris created by him; he shall remove all spatters and leave his part of the work in a clean and finished condition.

END OF SECTION