

Berkshire Local School District

BOARD OF EDUCATION

14259 Claridon Troy Road, P.O. Box 364, Burton, OH 44021
440-834-3380 440-834-2058 (Fax)

Legal Notice:

Berkshire Board of Education will receive bids for a roof replacement, including tear off at Ledgemont Elementary School. A mandatory pre-bid meeting will be held Thursday, May 25, 2017, at 12:15 pm at 16200 Burrows Road, Thompson, Ohio 44086. Bids will be received until 10:00 am on June 1, 2017 to beth.mccaffrey@berkshireschools.org or in a sealed envelope to the Board of Education Offices at 14259 Claridon Troy Rd., Burton, OH 44021. Specifications for bidding are available through Adam Bradley Enterprises Inc., johnm@adambradleyinc.com. This notice and bid specifications are posted at the district web site at www.berkshireschools.org. The Berkshire Board of Education reserves the right to accept or reject any or all bids.

Beth A. McCaffrey
Treasurer

Publish dates: May 18, 2017

Douglas J. DeLong
Superintendent

Beth A. McCaffrey
Treasurer

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President

Bryan Wadsworth
Vice President

James Boyd
Member

Kimberly Brown
Member

Barbara Raikes
Member

Adam Bradley Enterprises Inc.

www.adambradleyinc.com

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 Operations Manager
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No.	Description	Date
1	Bid Document	5.18.2017

Ledgemon Elementary Scope of Work

1. Remove all roofing, insulation, nailers, and flashings , to **Metal deck**
2. Remove all, counter flashings, and metal flashings
3. Remove all debris from deck and from the premise and dispose of property
4. Clean substrate of all debris and contaminants.
5. Deck shall be dry before installation of any subsequent components or materials
6. Immediately notify consultant of damaged decking before continuing roof system installation.
 - A. Repair or replace damaged decking at the direction of the consultant
8. Install 2 layers of insulation (R-25 total), tapered insulation, adhesives, fasteners, walkway pads, .060 Fully Adhered Membrane and all other roofing components / accessories as specified
9. Install treated lumber, flashings, expansion joints, equipment supports and metal details as required to provide substrate anchoring and elevations needed to accommodate details as specified and as indicated on the drawings.
10. Provide 20 year Manufacturers Warranty

PROJECT INFORMATION
 PROJECT LOCATION: Berkshire High School ADDRESS: 14510 N Cheshire St, Burton, OH 44021
 MANDATORY PRE-BID
 PRE-BID DATE: Thursday, May 25, 2017, at 12:15 pm
 MEETING LOCATION: LEDGEMONT ELEMENTARY16200 Burrows Road, Thompson, Ohio 44086
 BID INFORMATION:
 BID DUE DATE: THURSDAY, JUNE 1, 2017 BY 10 AM
 BIDS TO BE EMAILED TO: beth.mccaffrey@berkshireschools.org
 BID DROP-OFF LOCATION: Board of Education Offices at 14259 Claridon Troy Rd., Burton, OH 44021

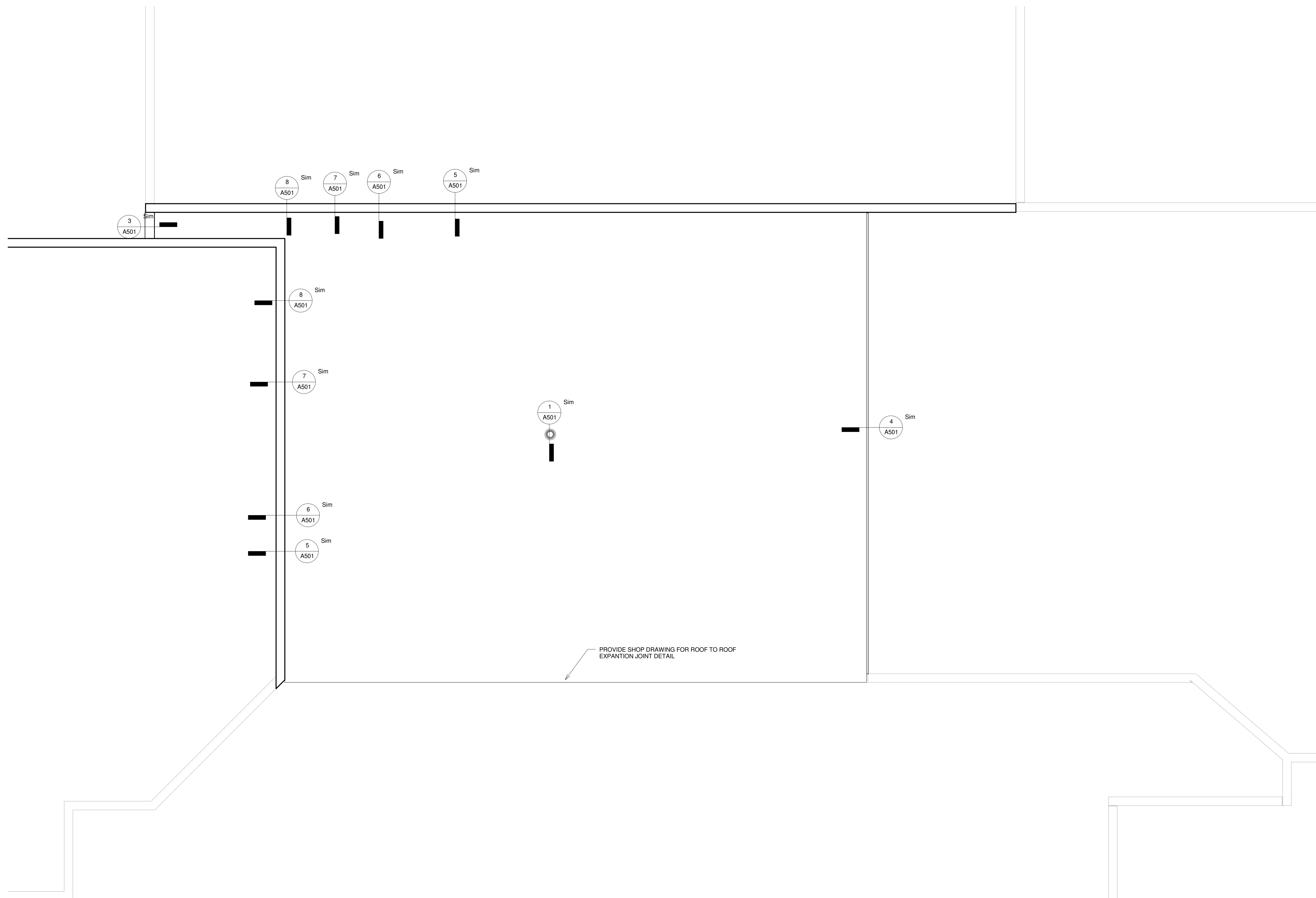
Sheet List	
Sheet Number	Sheet Name
A001	General Project Information
A102	Plan Sheet 1
A501	Detail Sheet 1

BERKSHIRE LOCAL SCHOOLS LEDGEMONT ROOF REPLACEMENT

General Project Information

Project number	
Date	5.18.2017
Drawn by	J.M.R.
Checked by	T.E.C.
A001	
Scale	N.T.S.

No.	Description	Date
1	Bid Document	5.18.2017



PROVIDE SHOP DRAWING FOR ROOF TO ROOF
EXPANTION JOINT DETAIL

**BERKSHIRE LOCAL
SCHOOLS
LEDGEMONT ROOF
REPLACEMENT**

Plan Sheet 1

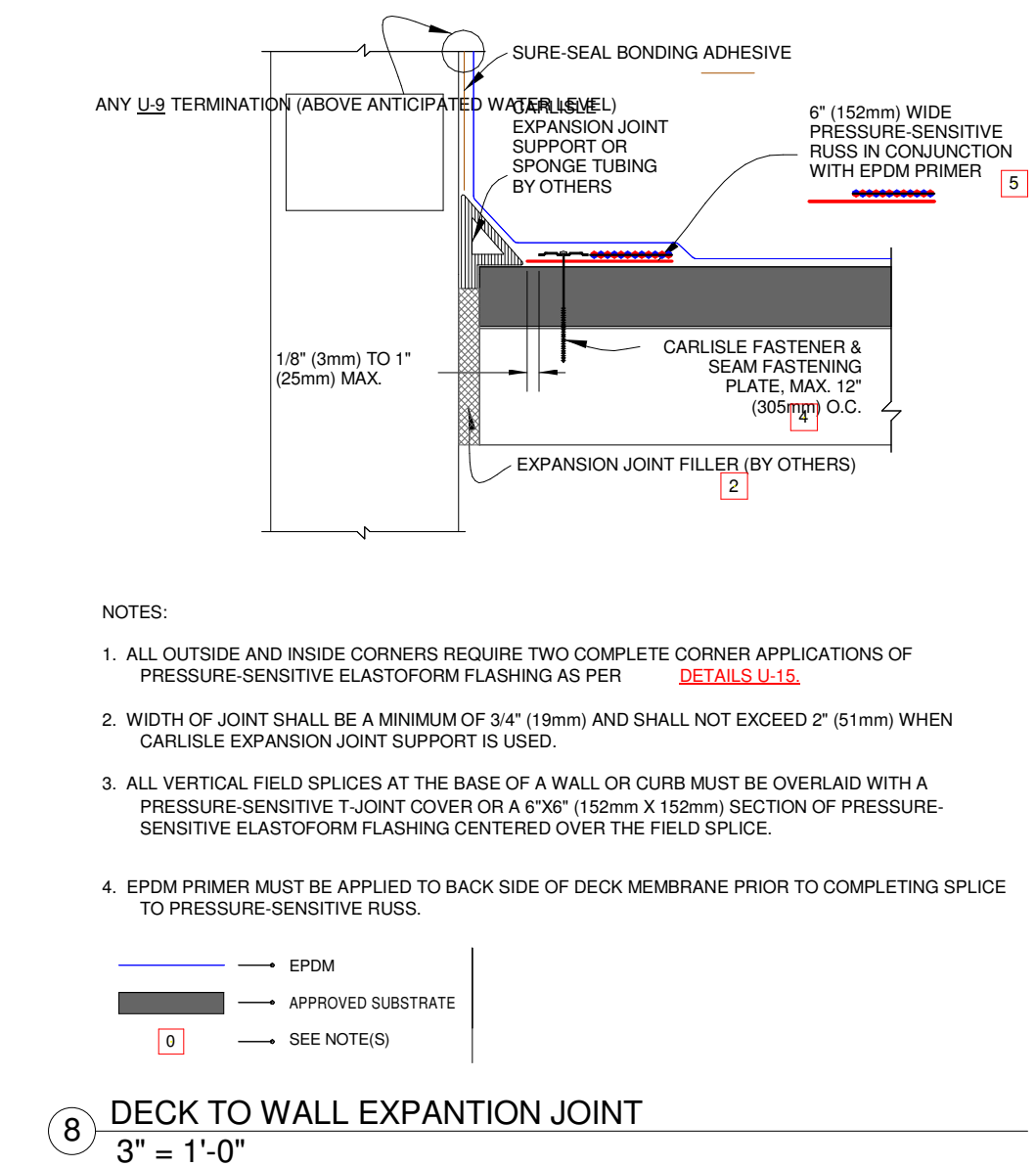
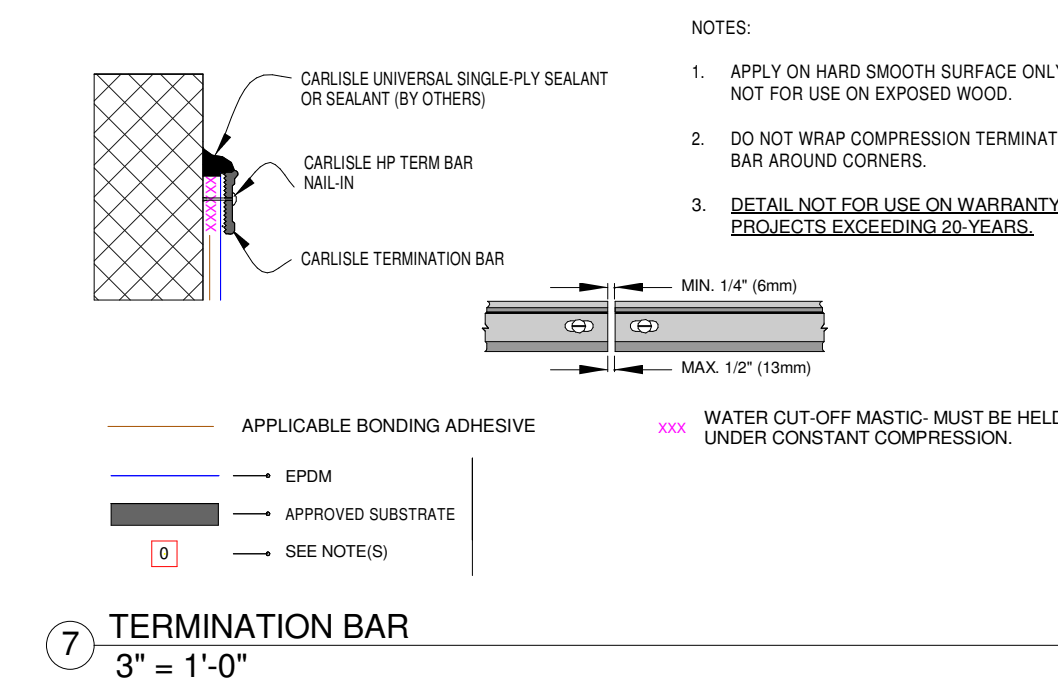
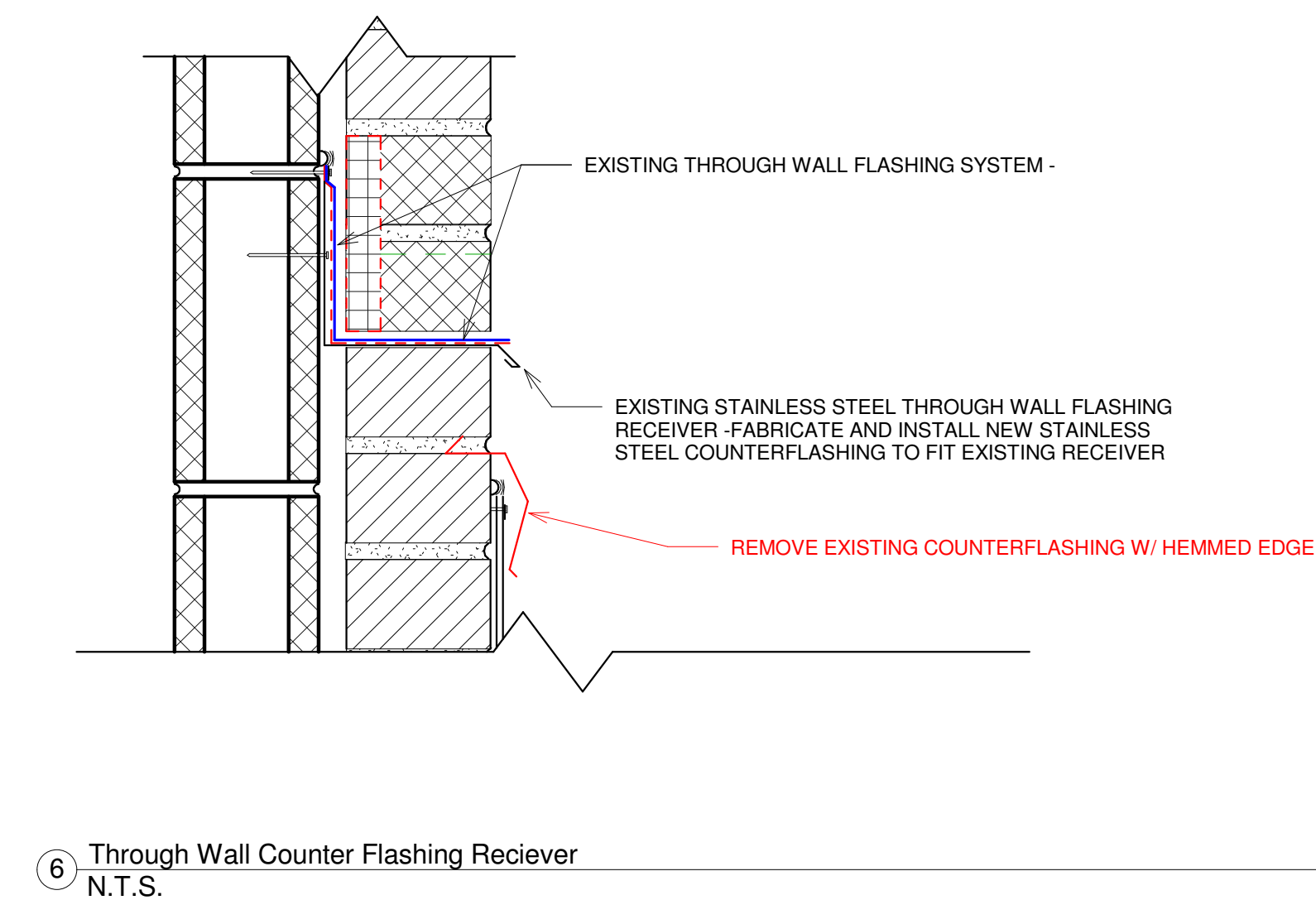
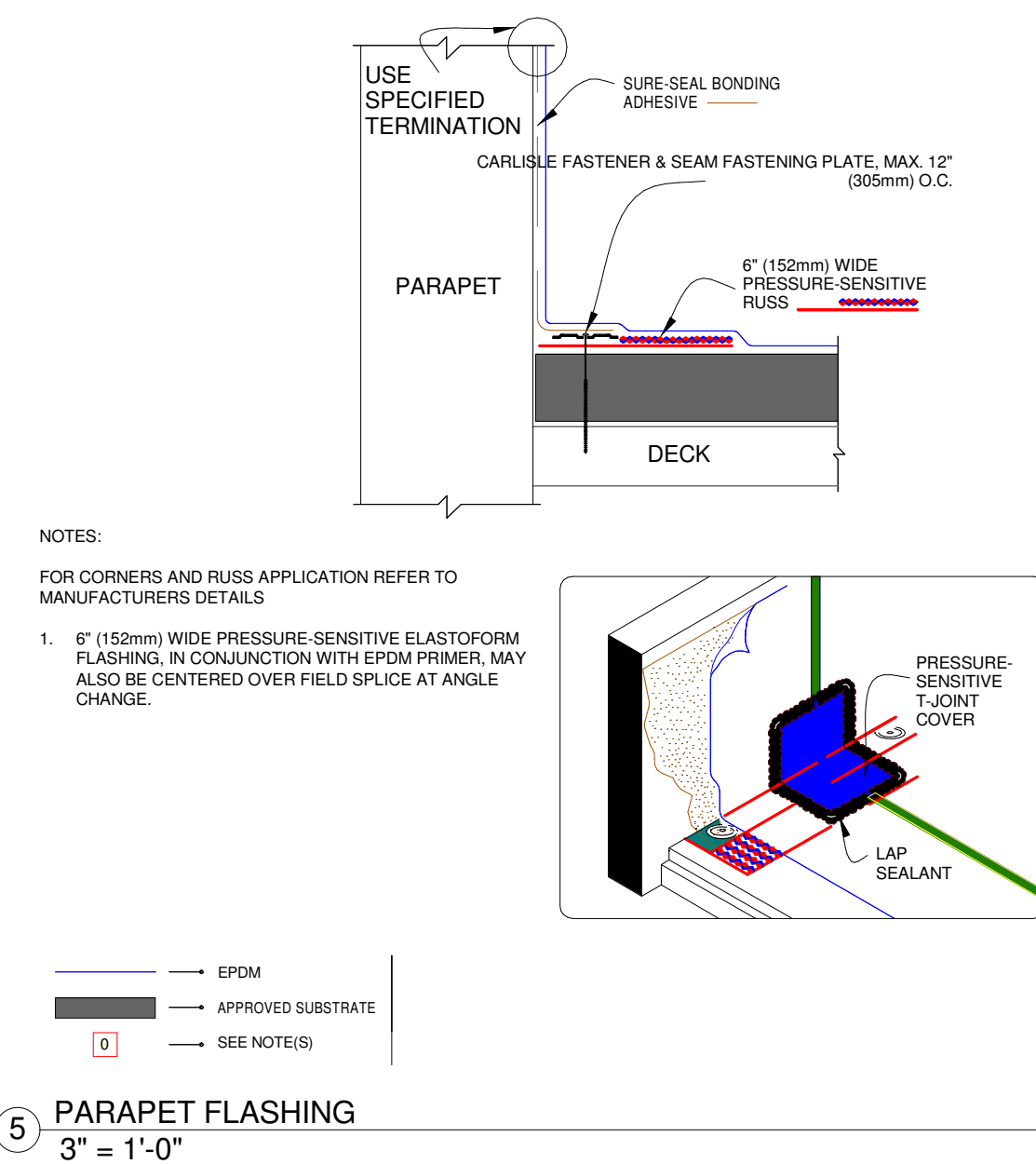
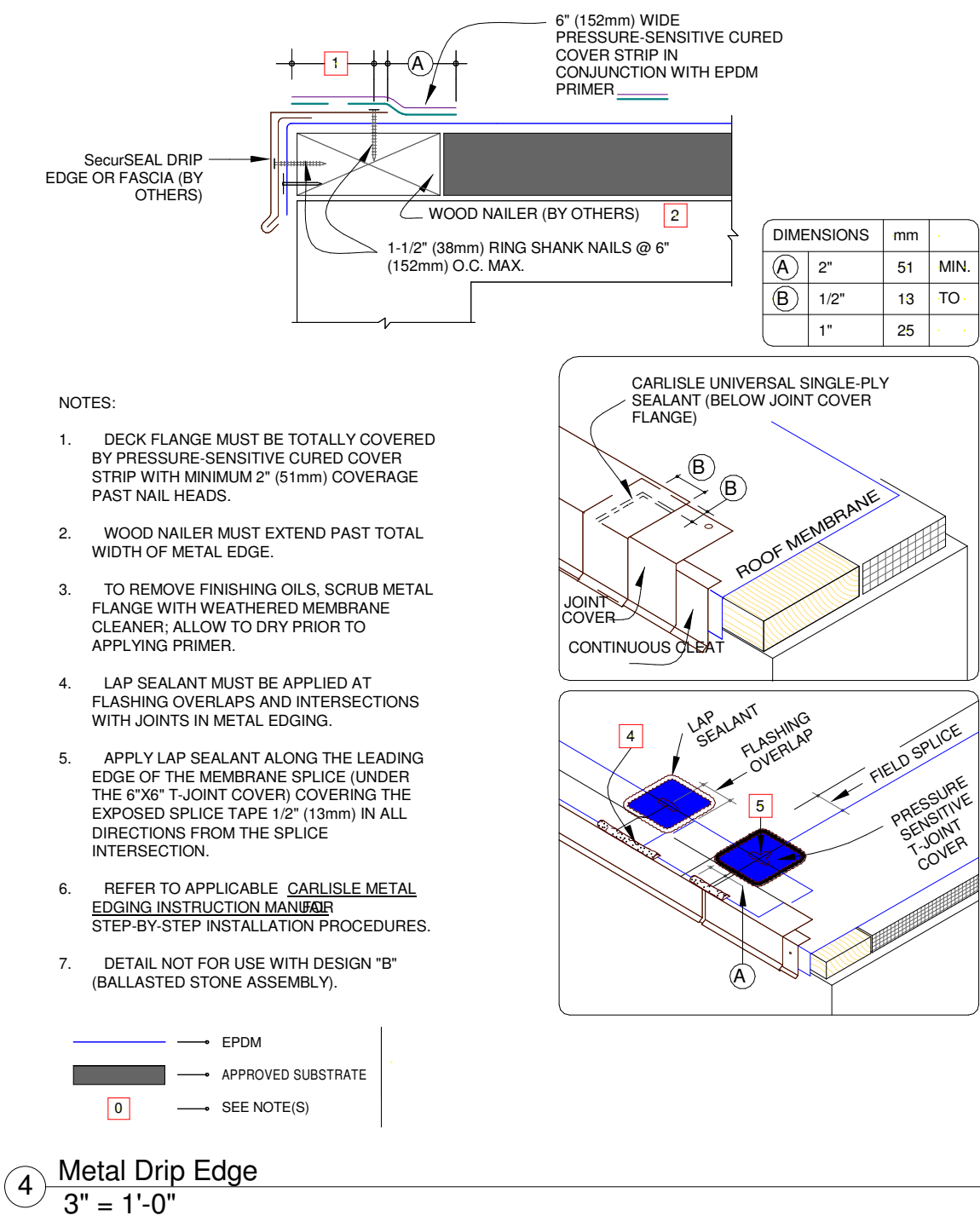
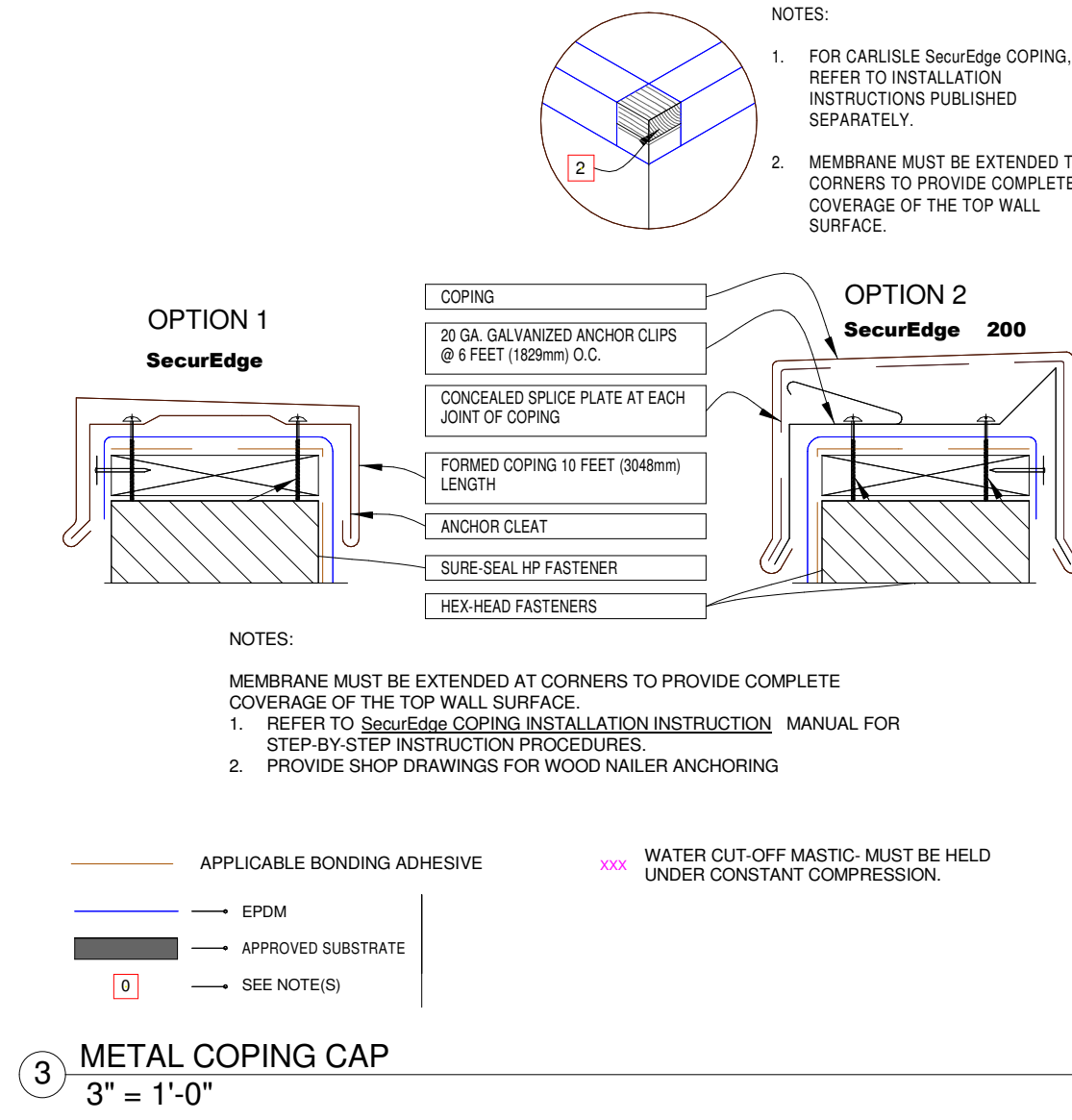
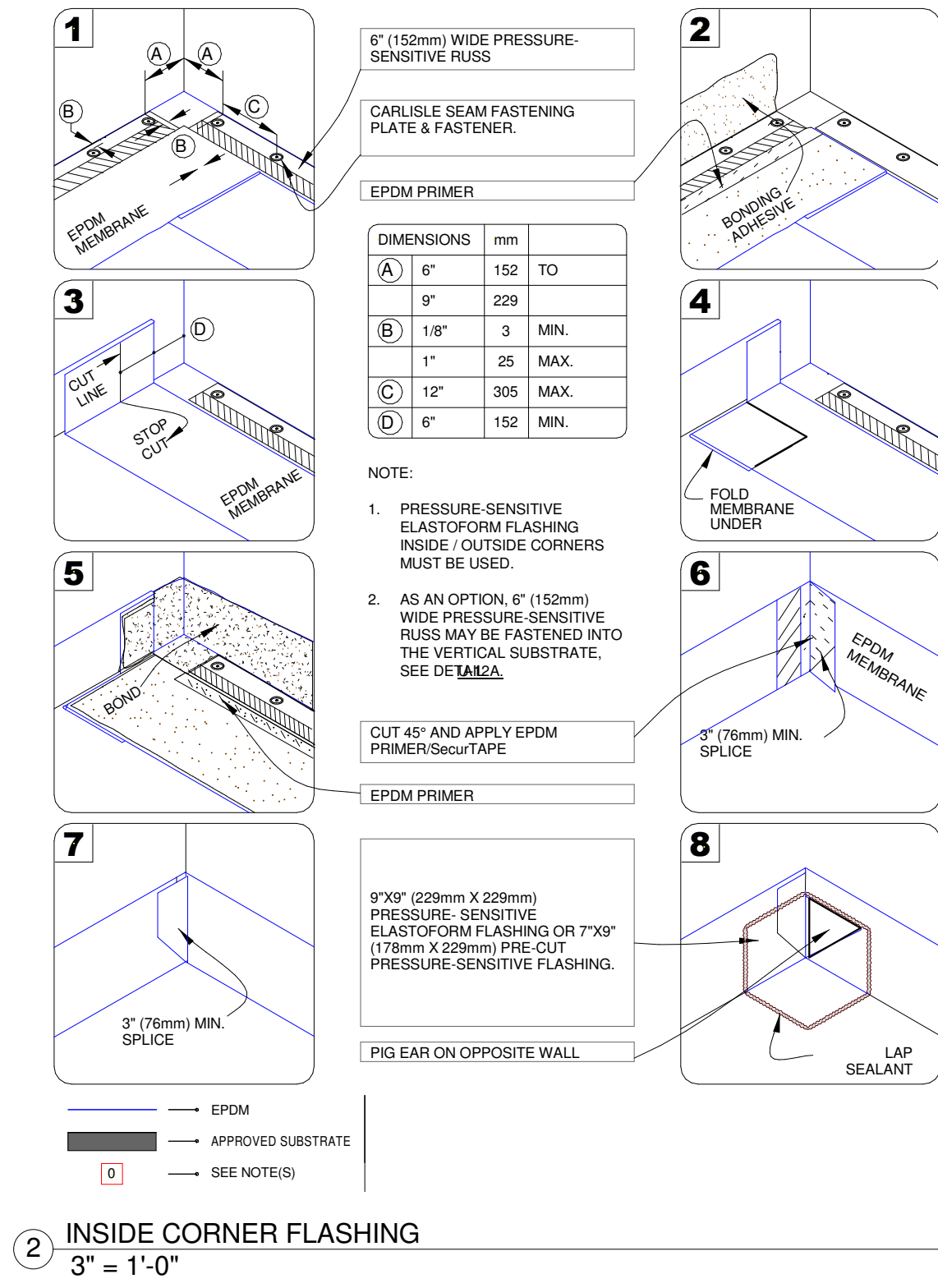
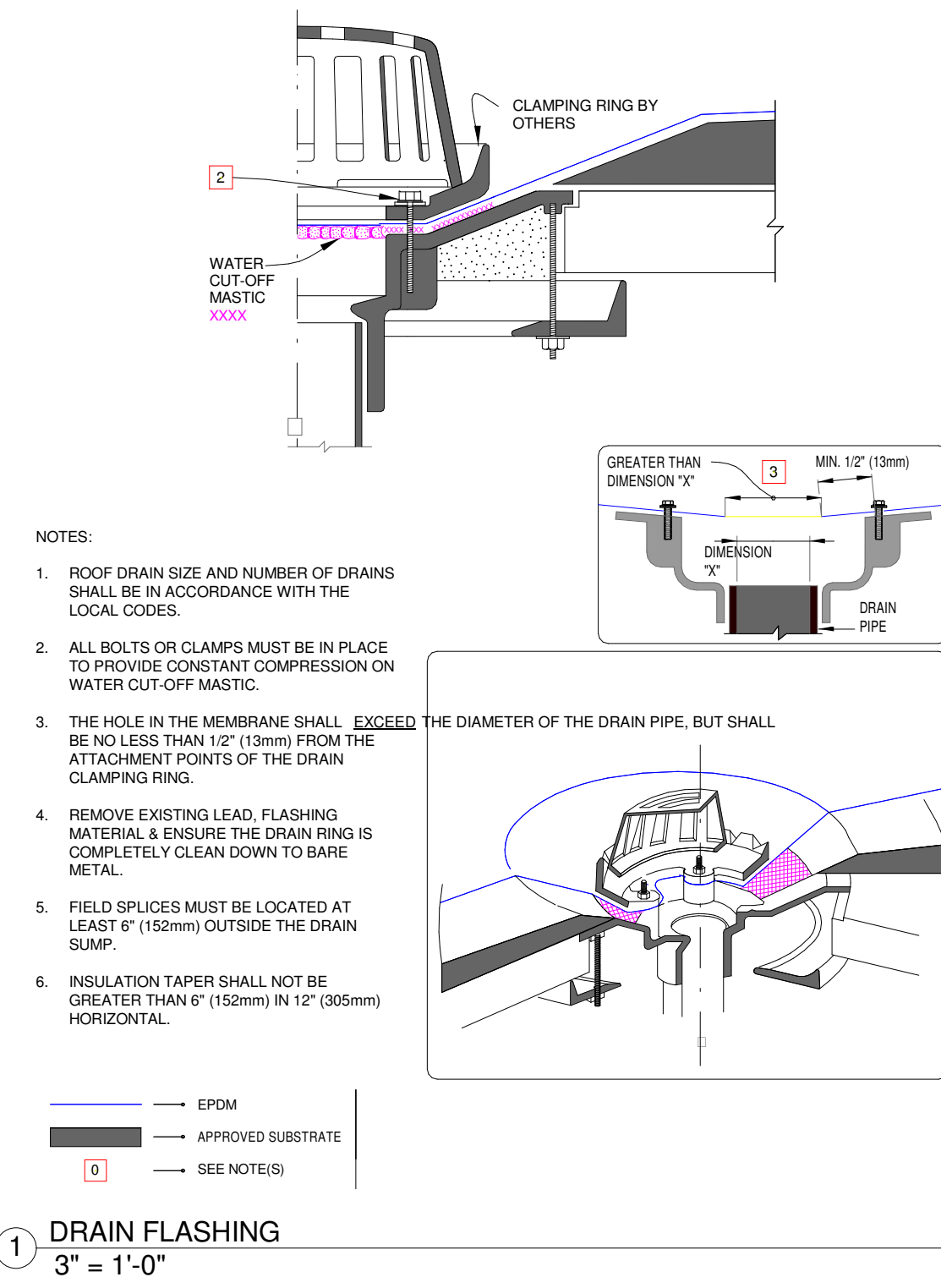
Project number	
Date	5.18.2017
Drawn by	J.M.R.
Checked by	Checker

A102

Scale

① Roof Level 2 - Dependent 1
3/16" = 1'-0"

No.	Description	Date
1	Bid Document	5.18.2017



BERKSHIRE LOCAL SCHOOLS LEDGEMONT ROOF REPLACEMENT

Detail Sheet 1

Project number	
Date	5.18.2017
Drawn by	J.M.R.
Checked by	T.E.C.

A501

Scale	N.T.S.
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ROOFING PROJECT MANUAL

&

SPECIFICATIONS

5/18/17

for

BERSHIRE LOCAL SCHOOL DISTRICT

14259 Claridon Troy

Burton, OH 44021

Ledgemont Elementary School
Roof Areas: as indicated in Drawings.

Date of Issue: **May 18, 2017**

Bid Due Date: **June 1, 2017 10:00 AM**

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SECTION 01 10 00
INSTRUCTION TO BIDDERS

1. PART 1 - GENERAL

1. **RELATED DOCUMENTS:**

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. **SEALED BIDS**

- A. Sealed bids will be received until:
June 1, 2017, 10:00 am, for general construction on designated roof areas of the **Ledgemont Elementary School** as indicated on the Drawings.

Address envelopes to:

Berkshire Board of Education
14259 Claridon Troy.
Burton, OH 44021

- B. Write in the lower left corner:
Ledgemont 2017 Roofing Project

3. **PLANS AND SPECIFICATIONS**

- A. Additional copies of blank proposals, plans, specifications and any further information desired may be obtained from Adam Bradley Enterprises, Inc. at (440) 543-4971.

4. **DEFINITION OF TERMS**

- A. Whenever the term "Owner" occurs in the Specifications or other documents, it shall mean Berkshire Local School District.
- B. Whenever the term "Owners Representative" occurs in the specifications, it shall mean Adam Bradley Enterprises, Inc.
- C. Whenever the term "Contractor" occurs in the Specifications or other documents, it shall mean a person, firm or corporation contracting with the Owner to supply labor, equipment, and materials specified herein for the successful completion of this contract.

5. **PRE-QUALIFICATION OF BIDDERS**

- A. Bidders expecting to bid may be required to file, prior to the time of award of contract, a confidential financial statement and experience questionnaire, which may be a complete report of the financial resources and liabilities, equipment, past record, and personnel.
- B. Bidders must submit names of any additional subcontractors to be utilized on the bid form attached. The Owner reserves the right to reject any subcontractors that do not meet Owner requirements.

6. **BIDDER REQUIREMENTS:**

- A. The Prime Bidder on this Project must have the experience and qualifications specified in the Construction Documents.
- B. Requests for substitutions of specified materials or practices must be submitted by the prime bidder. Requests for substitutions from manufacturers, suppliers or sub-contractors will not be considered.

7. ADDENDUM TO PROPOSAL

- A. The Owner reserves the right to modify the proposal to within 24 hours of the scheduled date for the opening of proposals. All addenda shall be in writing and sent to all bidders having attended the pre bid conference.

8. AWARDING OF CONTRACT

- A. The Owner reserves the right to award the contract to the lowest and best, and not necessarily to the lowest bidder, or to reject any or all bids without informalities.

9. EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK

- A. The bidder is expected to examine carefully the site of the proposed work, the proposal, plans, specifications, supplemental Owner Conditions, special provisions and contract forms, before submitting a bid. The submission of a bid shall be considered evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work, and as to the requirements of the site conditions, plans, specifications, supplemental conditions, special provisions and contracts, and no allowance will be made for lack of knowledge concerning such conditions after the contract is signed.
- B. Supplemental Owner Conditions that form a part of the Contract include, but are not necessarily limited to the following Documents:
 - 1. Bid Form
- C. Whenever differences exist between these specifications and the forms listed above, the more stringent requirements shall prevail.

10. PREPARATION OF BID PROPOSAL

- A. The bidder shall submit his bid upon the forms furnished by the Owner. All words and figures shall be in ink or typewritten.
- B. The bidder's bid must be signed with ink by the individual, by one or more members of the partnership, or by one or more officers of a corporation, or by an agent of the Contractor legally qualified and acceptable to the Owner. If the proposal is made by an individual, his name and business address must be shown; by a partnership, the name and business address of each partnership member must be shown; by a corporation, the name of the state under the laws of which the corporation is chartered and the name and title of the officer or officers having authority under the bylaws to sign contracts, the name of the corporation and the business address of its corporate official must be shown.

11. DELIVERY OF BIDS

- A. The bids shall be placed in a sealed envelope so marked as to indicate the identity of the project and the name and address of the bidder. Proposals will be received until the hour and date set for the opening thereof, and must be in the hands of the official indicated by such time. Bids received after the time for opening may be returned to the bidder unopened.
- B. Fax and/or E-mail transmittals of bids are not acceptable.

12. WITHDRAWAL OF BIDS

- A. A bidder may withdraw his bid, provided the request in writing is in the hands of the official indicated in the proposal by the time set for opening bid.

13. DISQUALIFICATION OF BIDDERS

- A. Any of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of his proposal or proposals:
 - 2. If the bid is on a form other than that furnished by the Owner or if the form is altered or any part thereof is detached.
 - 3. If there are unauthorized additions, conditional or substitute bids, or irregularities of any kind which may tend to make the bid incomplete, indefinite or ambiguous as to its meaning.
 - 4. If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award. This does not exclude a bid limiting the maximum gross amount of

awards acceptable to any one bidder at any one bid letting, provided that any selection of awards will be made by the Owner.

5. More than one proposal for the same work from an individual firm or corporation under the same or different name.
 6. Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any future work of the Owner until any such participant shall have been reinstated as a qualified bidder.
- B. Bid prices which obviously are unbalanced.

14. BID PROPOSAL FORM

- A. Each bidder shall submit an individual Bid Proposal Form. The Bid Proposal Form attached to these documents must be utilized; no alteration of the form shall be made.

15. INSURANCE

- A. The successful bidder shall provide The Owner with insurance coverage as listed in the Supplemental Owner Conditions and with the following minimum requirements;
1. The successful bidder shall provide The Owner with appropriate insurance coverage, including automobile liability, general liability, property insurance, etc. and name The Owner, an additional insured. Original sets of certificates shall be on file with The Owner before work commences. Each such certificate of insurance shall provide for payment of not less than the amount of \$2,000,000.00 for injury or death of one person and \$5,000,000.00 for any one accident, and \$2,000,000.00 for property damage for any one accident, and a total aggregate property damage limit of \$5,000,000.00. The successful bidder shall also agree to protect The Owner against all claims, demands, expenses, suits, or judgments arising because of, or resulting from the operations of the contractors, his agents, or his employees during the execution of this contract.
- B. Contractor shall provide Certificate of Insurance Coverage with coverage as noted in the Supplemental Owner Conditions.

16. PAYMENT AND PERFORMANCE BONDS

- A. Contractor shall provide to Owner a Payment Bond as well as a line item price to provide a Performance, Labor and Material Bond as listed in the Bid Form Documents.

17. TAXES

- A. The successful bidder shall be required to comply with all federal, state and local requirements and with Supplemental Owner Conditions with regard to any and all taxes owed and/or required.

18. WORK SCHEDULE AND PENALTIES

- A. The successful bidder shall conform to the requirements as listed in any Supplemental Owner Conditions that are provided.
- B. The Contractor shall start the Work upon notice to proceed and shall execute the Work with diligence and dispatch so as to maintain such schedules and milestones as established by the Owner.
- C. In the event that the Contractor should fail to maintain the progress schedule or the schedule as established above, the Owner reserves the right, after 48 hours formal notice, either by letter or telegram to the Contractor, to procure the materials, equipment, and labor necessary to proceed with, or to complete the Work, or any portion thereof from other sources and charge the cost thereof to the Contractor.

19. APPLICATION FOR PAYMENT

- A. The successful bidder shall apply for payments as listed in the Supplemental Owner Conditions.
- B. All suppliers and subcontractors must be paid in full and Waiver of Lien by major suppliers and subcontractors must be issued prior to any subsequent payments being made to the contractor.

- C. When all work has been completed, and a final inspection has been made, Contractor may invoice the Owner for 90% of the remaining labor and the materials which were provided by Contractor. Once any and all deficiencies have been corrected, the Owner will make payment of 90% of the balance of the total contract price, with adds and deducts, and will make payment of the remaining 10% once the warranty has been issued.

* * * END OF SECTION 01 10 00 - INSTRUCTIONS TO BIDDERS * * *

SECTION 01 11 00

SUMMARY OF WORK

1. PART 1 - GENERAL**1. RELATED DOCUMENTS:**

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY OF WORK:

- A. The Prime Bidder shall provide all labor, materials, tools, equipment, services, etc. to provide complete, watertight roof systems, drainage and other related work as shown and/or specified in the Bidding Documents.

B. Areas included:

1. Roof Replacement Areas;
a. As indicated on the Drawings.

C. Unit Prices:

1. Provide Unit Prices on Bid Form for the following items:
a. Base Bid;

Replace Metal Deck:	\$/square foot
Repair Metal Deck:	\$/square foot
Replace Existing Wood Curb:	\$/linear foot
Hourly Labor Rate:	\$/Hour
Replace existing Drain Assembly:	\$/Drain assembly

2. Include the quantities listed on the bid form in the base bid, additions to or subtractions from those indicated quantities to be adjusted by unit prices;

a. Base Bid 1;

Replace Metal Deck:	100 square feet
Repair Metal Deck:	200 square feet
Replace Existing Wood Curb:	0 linear feet
Hourly Labor Rate:	0 Hours
Replace existing Drain Assembly:	0 Drain assemblies

D. Base Bid:

1. Roof replacement on designated areas, work includes;
- Test all drains for free flow and bring clogged or slow draining drains to Owners attention for cleaning before beginning work.
 - Remove all roofing, insulation, nailers, and flashings, to deck.
 - Remove all counter flashings, copings, and metal flashings as indicated in Drawings.
 - Remove all debris from deck and from the premise and dispose of properly. Clean substrate of all debris and contaminants. Deck shall be dry before installation of any subsequent components or materials.
 - Repair or replace damaged decking as specified.
 - Raise all mechanical equipment where disconnect and reconnect is possible, raise support rails as needed to provide 8" minimum flashing Ht. and to replace all support rail metal caps.

- g. Install new support rails under equipment where curbs do not exist. All curbs and support rails to have sufficient height to provide 8 inches of space below the equipment. Install tapered insulation between support rails to provide sufficient slope to remove water where required.
- h. Install all insulation, tapered insulation, adhesives, fasteners, walkway pads and all other roofing components and accessories as specified. Roof membrane to be fully adhered 60 mil nominal, non-reinforced EPDM as specified.
- i. Install treated lumber, flashings and metal details as required to provide substrate anchoring and elevations need to accommodate details as specified and as indicated on the drawings.
- j. Install new walk pads from all doors and hatches to and around all serviceable equipment.

E. Alternate Bid 1

- 1. Provide Price to install new lightning protection system.

F. Alternate Bid 2

- 1. Provide Price to provide Payment and Performance Bond.

3. INTENT OF THE SPECIFICATIONS:

- A. The intent of these specifications is to describe the materials and methods of construction required for the performance of the work. In general, it is intended that the drawings shall delineate the detailed extent of the work. When there is a discrepancy between drawings, referenced specifications, and standards and this specification, this specification shall govern.
- B. Consultant designed the work conveyed in the Contract Documents for Owner's benefit. These Contract Documents are between Owner and Consultant only. Nothing contained in these Contract Documents shall create a contractual relationship between the Contractor and the Consultant.
- C. Assumption of Responsibility: Throughout these specifications, unless specifically noted otherwise, all work shall be assumed to be the sole responsibility of the Contractor

4. SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC "MasterFormat" numbering system.
 - 1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase

5. WORK UNDER OTHER CONTRACTS

- A. Owner may award separate contracts for related or unrelated construction operations at this site. These operations may be conducted simultaneously with work under this contract.
- B. Cooperation with other Contractors and Trades that may be present on the site is expected so that work on those contracts may be carried out. Owner reserves the right to resolve conflicts if required.

6. EXISTING HVAC AND ELECTRICAL EQUIPMENT

- A. Existing HVAC, Ductwork and electrical equipment will require temporary disconnection, relocation, and reconnection in order to raise flashing heights and/or to install new support curbs or support curb caps. Work to raise and reset this equipment shall be a part of this Contract.
 - 1. Cost to disconnect and reconnect shall be included in base bid. Equipment shut downs must be coordinated with Owner to provide minimum down time and disruption to interior operations.
- B. Electrical conduit and electrical items will have to be permanently relocated to prevent re-attachment to new roofing, flashing, or sheet metal components. Such work shall be a part of this contract and shall be performed by the appropriate licensed Union tradesmen. Cost of the work shall be included in Base Bid.

7. REGULATORY REQUIREMENTS**A. GOVERNING CODES AND STANDARDS:**

- 1. Work performed under this specification shall be in compliance with applicable Industry Standards and all applicable codes, laws, and ordinances of the municipal, state, and federal departments concerned. Materials and workmanship required by such regulations shall be provided by the Contractor whether or not specifically noted herein or shown on the drawings.
- 2. Bidders are directed to immediately advise the Consultant if they discover any materials, products, or designs that conflict with or fail to satisfy any of the following Codes, Standards or Local Ordinances;
 - a. Ohio Building Code (OBC)
 - b. National Fire Protection Association (NFPA)
 - c. Occupational Safety and Health Standards of Construction Industry (OSHA)
 - d. Factory Mutual Global (FMG)
 - e. Underwriters Laboratories (UL)
- 3. Industry Standards: Minimum standards of construction shall comply with all applicable standards including but not limited to;
 - a. NRCA
 - b. SMACNA
- B. The above notwithstanding, Industry Standards and Codes are recognized as minimum requirements. In many cases these Contract Documents specify materials, quantities, thicknesses, details, assemblies, etc., that clearly exceed the Industry Standards and prevailing Codes. In all these cases the more stringent requirements in the Contract Documents shall be required.

8. NOTICES AND POSTINGS:

- A. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the Work. If Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, without providing notice to building owner's representative, Contractor shall assume full responsibility and shall bear all costs.
- B. All permits shall be placed in a plastic container and be kept in the location designated by the Owner for the entire duration of the work the following;
 - 1. Copies of all permits
 - 2. Copies of all MSDS sheets

9. PERMITS AND FEES:

- A. The Contractor shall apply for and secure all incidental permits, governmental fees and licenses necessary for proper execution and completion of the Work including any necessary architectural or engineering stamps required for permit approval.

10. PROTECTION:

- A. The Contractor shall use precautions necessary to provide for the safety of property owner, visitors to the site, and all connected with the work of this project.
- B. All existing facilities both above and below ground shall be protected and maintained free of damage. Existing facilities shall remain operating during the period of construction unless otherwise permitted. All access roadways must remain open to traffic unless otherwise permitted.
- C. Cranes and delivery vehicles may be placed only where approved by the Owner. Cranes may only be used during the hours of 4:00 pm and 6:00 am on weekdays and from 4:00 pm on Fridays until 6:00 am on Sundays.

11. SAFETY REQUIREMENTS

- A. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
- B. Comply with applicable Federal, State, Local and Owner health and safety requirements.
- C. Notify the Owner in advance whenever work is expected to be potentially hazardous and/or harmful to persons and/or property on the site. Contractor is solely responsible for employing means and methods (acceptable to the Owner) deemed necessary to prevent harm to such persons and property.
- D. Maintain a construction crewmember as a Floor Area Guard whenever roof decking is being repaired or replaced.
- E. Maintain proper fire extinguishing equipment and trained personnel within close proximity and with unobstructed access to work areas whenever power tools, torches and/or other heat-producing equipment is being used on the project.
- F. ALL SAFETY REQUIREMENTS OF THE BUILDING OWNER INCLUDING OBTAINING OWNER ISSUED PERMITS AND EMPLOYEE SAFETY TRAINING MUST BE FOLLOWED. NO EXCEPTIONS WILL BE PERMITTED. CONTRACTOR SHALL COMPLY WITH OWNERS VENDOR AGREEMENT THAT IS PART OF THE SUPPLEMENTAL OWNER CONDITIONS.

12. CONTRACTOR REQUIREMENTS

- A. Maintain a daily job log to be kept on site at all times from the pre-roofing conference until final close-out. The job log shall include:
 - 1. Copies of all submittals.
 - 2. Safety coordinator appointment with emergency telephone numbers; fall protection plan and material safety data sheets for all products.
 - 3. A field sketch showing areas of work for the day.
 - 4. Accident reports
 - 5. Material delivery records; and a visitor register.
 - 6. Complaint log, listing complaints received from any party of any nature, and the actions taken and resolution, with dates and names of individuals involved.
- B. Contractor shall provide a foreman or superintendent to be present on the job site at all times to supervise all Work by all subcontractors utilized on the project. On site Foreman/Superintendent must have a cell phone on site at all times and provide number to Consultant and Owner.

*** * * END OF SECTION 01 11 00 SUMMARY OF WORK * * ***

SECTION 01 14 00

CONTRACTOR'S USE OF PREMISES

1. PART 1 - GENERAL**1. RELATED DOCUMENTS:**

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. DESCRIPTION

- A. Work included: This Section applies to situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon Owner's property.

3. SUBMITTALS**4. QUALITY ASSURANCE**

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Owner may require all personnel who will enter upon the Owner's property to certify their awareness of and familiarity with requirements of this Section.

5. BUILDING OCCUPANCY

- A. The facility will be occupied and in use during construction. Cooperate with Owner during construction process to minimize disruptions of Owner usage. No roof removal or deck replacement is to occur over occupied spaces.
- B. Contractor is fully and solely responsible for the safety and protection of all occupants going into, leaving out of, or occupying the interior of the buildings. All costs associated with providing this service are to be included in the base bids.
- C. Maintain existing buildings in a weather tight condition throughout the construction process. Protect buildings and occupants during all construction operations and repair any damage caused by construction operations immediately.
- D. All roofing areas removed must be installed complete with all terminations and flashings on the same day as removal or before rain or precipitation commences.

6. TRANSPORTATION FACILITIES

- A. Driveways and Entrances: Keep driveways and entrances clear. Do not park vehicles or store materials unless specifically authorized by the Owner.
 - 1. Schedule deliveries to minimize the use of driveways and entrances.
 - 2. Load, unload and store materials and equipment to minimize use of space and time requirements at loading, temporary storage and set up areas.
- B. Do not use handicapped parking area(s) at any time for any purpose.
- C. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach job site. If any damage occurs the contractor is responsible for repairs.
- D. Use of cranes, dumpsters or other impediments to traffic must be confined to hours and locations allowed by the Owner;
 - 1. Cranes and delivery vehicles may be placed only where approved by the Owner.
 - 2. Cranes may only be used during the hours approved by the Owner.
 - 3. Cranes must be equipped with flags and lights as required by federal regulations for aircraft warnings. Crane booms must be lowered when notified of helicopter landings.

- E. Contractor's vehicles:
 - 1. Require Contractor's vehicles, vehicles belonging to employees of Contractor, and all other vehicles entering upon Owner's property in performance of Work of Contract, to use only the access areas approved in advance by Owner.
 - 2. Do not permit such vehicles to park on any street or other area of Owner's property except in the area approved by Owner as "Contractor's Parking Area."
- 7. **SET UP AND STAGING**
 - A. Use of setup area is restricted to the hours approved by the Owner.
 - B. The existing roof must be repaired and restored to its original condition and the system warranty manufacturer must be notified to inspect the system at the completion of the project. All repairs recommended by the warranty holder must be completed to keep the existing warranty in effect.
- 8. **LANDSCAPING**
 - A. Provide adequate protection for trees, grass, shrubs and all other landscaping during set-up or construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.
 - B. Landscaping must be restored to original condition.
- 9. **FACILITY USAGE**
 - A. Use of Site: Limit use of site to work in areas established during pre-bid and pre-construction meetings. Do not utilize or disturb areas of the site not previously identified beyond the work area without prior written approval.
 - 1. Do not store materials or debris inside building areas, including penthouses or on roof areas not being replaced or that are newly installed.
 - B. Safety: Do not block fire exits or doorways. Allow for egress of traffic at all times. Keep driveways and entrances serving the premises open and clear for use by the Owner, Owner's employees and emergency vehicles at all times
 - C. Provide adequate protection for all interior and exterior portions of the building during set-up and construction. If any damage occurs the contractor is responsible for repairs as designated by the Owner.
 - D. Toilets: Provide temporary toilet facilities for use during construction. Use of Owner facilities is not permitted
- 10. **OWNER CONDITIONS**
 - A. The following Owner conditions shall apply throughout the course of the work. Violation of these conditions shall be grounds for immediate and permanent removal from the site of the offending personnel, or entire crew.
 - 1. Audio Equipment: Playing of radios, tape players, CD players, televisions, or other audio devices is prohibited everywhere on site.
 - 2. Appropriate Clothing: Construction personnel shall dress in appropriate clothing at all times, everywhere on site. Shirts and full length pants shall be worn at all times. No article of clothing or visible body parts may have obscene or profane language or graphics displayed on it in any manner.
 - 3. Smoking: Smoking is prohibited at all times. There are no designated smoking areas on any Owner property.
 - 4. Language: Loud or abusive language, particularly obscene or profane language is prohibited at all times.
 - 5. Firearms, alcoholic beverages and illegal drugs are strictly prohibited at all times.
 - 6. Comply with Owners Vendor Agreement that is part of the Supplemental Owner Conditions.
- 11. **SECURITY**
 - A. Restrict access of all persons entering upon the Owner's property to the Access Route and to the actual site of the work.

2. PART 2 – PRODUCTS (Not Used)

3. PART 3 – EXECUTION (Not Used)

* * * END OF SECTION 01 14 00 CONTRACTORS USE OF PREMISES * * *

SECTION 01 15 00

REGULATORY REQUIREMENTS

1. PART 1 - GENERAL**1. RELATED DOCUMENTS:**

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. PERMITS AND FEES:

- A. The Contractor shall apply for and secure all incidental permits, governmental fees and licenses including any necessary engineering or architectural stamps required as necessary for proper execution and completion of the Work.
- B. All permits shall be placed in a plastic tube and be kept in the location designated by the Owner for the entire duration of the work.

3. GOVERNING CODES:

- A. Work performed under this specification shall be in compliance with applicable codes, laws, and ordinances of the municipal, state, and federal departments concerned. Materials and workmanship required by such regulations shall be provided by the Contractor whether or not specifically noted herein or shown on the drawings.

4. NOTICES:

- A. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the Work. If Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, without providing notice to building owner's representative, Contractor shall assume full responsibility and shall bear all costs.

5. REGULATORY REQUIREMENTS

- A. Federal, State and local building and fire codes.
- B. OSHA and EPA requirements

* * * END SECTION 01 15 00 REGULATORY REQUIREMENTS * * *

SECTION 01 15 30

CHANGE ORDER PROCEDURE

1. PART 1 - GENERAL**1. RELATED DOCUMENTS:**

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. DESCRIPTION**A. Work included:**

- 1. Make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by the Owner and the Designated Owner's representative and issued after execution of the Contract, in accordance with the provisions of this Section.

3. QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order data.

4. SUBMITTALS

- A. Make submittals directly to the Designated Owner's Representative at his normal place of business.
- B. Submit the number of copies called for under the various items listed in this Section.

5. PRODUCT HANDLING

- A. Maintain a "Register of Bulletins and Change Orders" at the job site, accurately reflecting current status of all pertinent data.
- B. Make the Register available to the Designated Owner's representative for review at his request.

6. PROCESSING CHANGES INITIATED BY THE OWNER

- A. Should the Owner contemplate making a change in the Work or a change in the Contract Time of Completion, the Designated Owner's representative will issue a "Bulletin" to the Contractor.
 - 1. Bulletins will be dated and will be numbered in sequence.
 - 2. The Bulletin will describe the contemplated change, and will carry one of the following instructions to the Contractor:
 - a. Make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion;
 - b. Promptly advise the Designated Owner's representative as to credit or cost proposed for the described change. This is not an authorization to proceed with the change.
- B. If the Contractor has been directed by the Designated Owner's representative to promptly advise him as to credit or cost proposed for the described change, the Contractor shall:
 - 1. Analyze the described change and its impact on costs and time;
 - 2. Secure the required information and forward it to the Designated Owner's representative for review.
 - 3. Meet with the Designated Owner's representative as required to explain costs and, when appropriate, determine other acceptable ways to achieve the desired objective;
 - 4. Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Designated Owner's representative in writing when such avoidance no longer is practicable.

7. PROCESSING CHANGES INITIATED BY THE CONTRACTOR

- A. Should the Contractor discover a discrepancy among the Contract Documents or other cause for suggesting a change in the Work, a change in the Contract Sum, or a change in the Contract Time of Completion, he shall notify the Designated Owner's representative as required by pertinent provisions of the Contract Documents.
- B. Upon agreement by the Designated Owner's representative that there is reasonable cause to consider the Contractor's proposed change, the Designated Owner's representative will issue a Bulletin in accordance with the provisions described in Article 1.6 above.

8. PROCESSING BULLETINS

- A. Make written reply to the Designated Owner's representative in response to each Bulletin.
 - 1. State proposed change in the Contract Sum, if any.
 - 2. State proposed change in the Contract Time of Completion, if any.
 - 3. Clearly describe other changes in the Work required by the proposed change or desirable therewith, if any.
 - 4. Include full backup data such as subcontractor's letter of proposal or similar information.
 - 5. Submit this response in single copy.
- B. When cost or credit for the change has been agreed upon by the Owner and the Contractor the Designated Owner's representative will issue a "Change Order" to the Contractor.

9. PROCESSING CHANGE ORDERS

- A. Change Orders will be dated and will be numbered in sequence.
- B. The Change Order will describe the change or changes, will refer to the Bulletin or Bulletins involved, and will be signed by the Owner and the Designated Owner's representative.
- C. The Designated Owner's representative will issue three copies of each Change Order to the Contractor.
 - 1. The Contractor promptly shall sign all three copies and return two copies to the Designated Owner's representative.
 - 2. The Designated Owner's representative will retain one signed copy in his file and will forward one signed copy to the Owner.
- D. Should the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
 - 1. The Contractor promptly shall return two copies of the Change Order, unsigned by him, to the Designated Owner's representative with a letter signed by the Contractor and stating the reason or reasons for the Contractor's disagreement.
 - 2. The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under pertinent provisions of the Contract Documents.

*** * * END OF SECTION 01 15 30 CHANGE ORDER PROCEDURE * * ***

SECTION 01 30 00

ADMINISTRATIVE AND SPECIAL PROJECT REQUIREMENTS

1. PART 1 - GENERAL REQUIREMENTS

10. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

11. COORDINATION, SEQUENCING, AND SCHEDULING

A. Work Hours:

- 1. Work day is limited to the local city ordinance and Owner requirements.
 - 2. Work week is confined to hours permitted by local codes. Overtime hours can be worked during hours permitted by local codes. No additional compensation for premium time or over time will be allowed.
 - 3. HVAC equipment that must be shut down to be raised and/or re-mounted must be coordinated with Owner to provide minimum down time and disruption to interior operations.
 - 4. Duct work, electrical or mechanical equipment shutdowns must be coordinated with Owner to provide minimum down time and disruption to interior operations.
- B. Coordinate work with all installers and subcontractors to ensure proper sequencing of related trades and efficient and orderly installation of each part of the work in a manner that minimizes inconvenience to the Owner.
- C. Drainage: Coordinate all removal and replacement so that all roof areas have proper and unrestricted drainage at all times.
- D. Coordinate and schedule work within 30 feet of air intakes with the Owner. Work to be performed only when fans and intakes can be shut down.
- 1. Install tarpaulins over intake vents after shut down occurs.
 - 2. Remove tarpaulins daily after work is complete and inform Owner that intakes can be re-started.
- E. Material loading and debris removal from the set up area is restricted to the hours approved by the Owner.

12. ENVIRONMENTAL REQUIREMENTS

- A. Do not proceed with the Work under adverse weather conditions, immediately after rainfall (for weather sensitive products), or when climatic conditions are outside manufacturer's recommended limitations for installation. Proceed with the work only when weather forecasts are favorable for proper development of the performance characteristics of the materials.
- B. Do not work in rain, snow or in presence of water, dew or frost.
- C. Weather delays may not extend the schedule, as defined in the terms of the Construction Documents, unless specifically approved by the Owner, at the Owner's sole discretion

13. HVAC AND RELATED WORK

- A. HVAC, Ductwork and electrical equipment will require temporary disconnection, relocation, and reconnection in order to raise flashing heights and/or to install new support curbs or support curb caps. Work to raise and reset this equipment shall be a part of this Contract
 - 1. Cost to disconnect and reconnect shall be included in Base Bid. Equipment shut downs must be coordinated with Owner to provide minimum down time and disruption to interior operations.

- B. Coordinate with Owner to remove and re-install ducts where indicated on the Drawings. Clean and paint outside of all ducts on all roof areas.
- C. Equipment shut downs must be coordinated with Owner to provide minimum down time and disruption to interior operations.
- D. Conduits, junction boxes, cabling, etc. that are mounted on walls or copings must be moved and remounted on masonry above the counter flashings or on proper blocking or supports on the roof. No such items may be mounted or remounted in a manner in which attachment penetrates flashing or metal roof components.

14. PROTECTION AND CLEANING

- A. Protect building, property, equipment, roads, approaches, parking areas, loading dock areas, sidewalks, vehicles, and landscaping from damage due to the Work, including but not limited to contamination, soiling, staining or defacing.
- B. Protect workers from radiation, including rooftop microwave antennas in accordance with OSHA regulations, ANSI standards and FCC regulations published in 47 CFR 1.1307(b).
 - 1. Do not move or disturb roof top antennas with unqualified personnel. Use only appropriate tradesmen approved by the Owner to move or relocate antennas or dishes.
- C. Clean and protect construction in process and adjoining materials in place during handling and installation. Apply protective coverings where necessary to prevent damage or deterioration.
- D. Coordinate and sequence Work so that other trades do not damage completed installations.
- E. The Contractor is responsible for the protection of all vegetation, persons, and property on the site and the adjoining rights of way from the Work associated with this Project. Any damaged items will be replaced or repaired to the satisfaction of the Owner.
- F. The Contractor is responsible for daily clean-up of all debris and for protection of all persons and property in and around the work areas. Any soiling of or damage to vehicles, pedestrians, personal property or real property caused by Work from this Project will be the responsibility of the Contractor.
- G. The Contractor shall not discontinue the job once work has begun. A full crew must be on site performing appropriate Contract Work on any day in which work can be performed.
- H. Unapproved Subcontractors cannot be utilized on this Project. All Subcontractors are subject to the Owners approval.

15. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- A. Before submitting a bid, each Bidder will, at Bidders own expense make or obtain any additional examinations, investigations, exploration, tests, and studies and obtain any additional information and data which pertain to the physical conditions at or contiguous to the site or otherwise which may affect cost, progress performance or furnishing of the Work and which the Bidder deems necessary to determine that its Bid for performing and furnishing the Work is in accordance with the time, price and other terms and conditions of the Contract Documents.
- B. On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for the submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former conditions upon completion of such exploration.
- C. The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of the Construction Documents and that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing the Work.

2. PART 2 – PRODUCTS (Not Used)

3. PART 3 – EXECUTION

3.10.GENERAL

- A. Measurements: Independently verify dimensions shown on Drawings or in these specifications. Contractor is responsible for all measurements and dimensions including dimensional variations from place to place on the building, or variations between actual field dimensions and those that may be indicated in these specifications and drawings.
- B. Moisture: Contractor is responsible for the consequences of moisture in or on substrates that may interfere with the Work. Perform testing as necessary to determine if moisture that will interfere with the Work is present. Remove moisture or remove and replace moisture containing materials before completing installation of the Work.

END OF SECTION 01 30 00 - ADMINISTRATIVE AND SPECIAL PROJECT REQUIREMENTS

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

1. PART 1 - GENERAL

1.1 SUMMARY

A. This section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General Project Coordination.
2. Conservation.
3. Cleaning and Protection.

1.2 GENERAL PROJECT COORDINATION

A. Coordination: The Contractor shall coordinate the construction operations of all the installers and Subcontractors to ensure the efficient and orderly installation of each part of the Work.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with Subcontractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: The Contractor shall coordinate scheduling and timing of required administrative procedures with all other construction activities and activities of other Subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Installation and removal of temporary facilities, roadways and controls.
2. Delivery and processing of submittals.
3. Progress meetings.
4. Pre-construction meetings.
5. Project closeout activities.

C. Inspection of Conditions: Contractor shall inspect both the substrate and conditions under which Work is to be performed. Installers shall not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the Installer as well as the manufacturer of the product, material, or equipment. Proceeding with an installation shall be considered prima facie evidence that the substrates and conditions under which the Work is to be performed are completely satisfactory and acceptable to the installer, and that they will not adversely affect the installation in any way.

D. Contractor shall coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

E. Leaks: It is understood that this project will be weather tight and free from leaks of any type. All leaks that occur during construction, or the Warranty period shall be immediately and properly repaired within twenty four (24) hours of its reported occurrence at no cost to the Owner unless as a result of specific warranty exclusions or if leak was a documented pre-existing condition in an area not yet worked on by the Contractor.

F. Manufacturer's Instructions: Where installations include manufactured products or equipment, comply with manufacturer's applicable instructions and recommendations for installation, only to the extent that these instructions or recommendations are more explicit or more stringent than other requirements shown in the Contract Documents.

- G. Contractor shall install each unit of Work during weather conditions and Project status which will assure the best possible results in coordination with the entire Work. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
- H. Understanding that the introduction of moisture into the building spaces during construction can foster the growth of mold, mildew and fungi, Contractor shall be responsible for taking whatever steps necessary to prevent moisture infiltration into the building spaces during construction.

1.3 CONSERVATION

- A. Conservation: Contractor shall coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
- B. Salvage materials and equipment involved in performance of, but not actually incorporated into, the work.

1.4 CLEANING AND PROTECTING

- A. Contractor shall clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.
- B. Contractor shall clean and provide maintenance on completed construction as frequently as necessary though the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- C. Limiting Exposures: Contractor shall supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures may include, but are not limited to, the following;
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Thermal shock.
 - 5. Excessively high or low humidity.
 - 6. Air contamination or pollution.
 - 7. Water or ice.
 - 8. Solvents.
 - 9. Chemicals.
 - 10. Sunlight (UV)
 - 11. Radiation.
 - 12. Puncture.
 - 13. Abrasion.
 - 14. Heavy traffic.
 - 15. Soiling, staining, and corrosion.
 - 16. Bacteria.
 - 17. Rodent and insect infestation.
 - 18. Combustion.
 - 19. Electrical current.
 - 20. High-speed operation.
 - 21. Improper lubrication.
 - 22. Unusual wear or other misuse.
 - 23. Contact between incompatible materials.
 - 24. Destructive testing.
 - 25. Misalignment.
 - 26. Excessive weathering.

27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

2. PART 2 - PRODUCTS (Not Used)

3. PART 3 - EXECUTION (Not Used)

*** END OF SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION ***

SECTION 01 31 10

PROJECT MEETINGS

1. PART 1 - GENERAL REQUIREMENTS

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.
- B. Related section: Section 01770 – Contract Close-Out.

2. SUMMARY

- A. This section specifies requirements for meetings and administrative procedures that include but are not limited to the following:
 - 1. Preconstruction conference.
 - 2. Progress meetings.
 - 3. Substantial Completion inspection.
 - 4. Final Completion inspection and Project Close-out

3. SUBMITALS

- A. See Related Sections: Section 01100 – Summary and Section 01330 – Submittals.

4. PRECONSTRUCTION CONFERENCE

- A. The Preconstruction Conference will be scheduled within 5 working days after the Owner has issued the Notice to Proceed, but prior to actual start of the Work. All submittals must be received prior to time of the Conference.
- B. Attendance: Consultant, roofing manufacturer/supplier, and Contractor's Representative.
 - 1. Minimum agenda: Data will be distributed and discussed on:
 - a. Organizational arrangement of Contractor's forces and personnel, and those of Subcontractors, materials suppliers, and the Consultant.
 - b. Channels and procedures for communication.
 - c. Review set-up area and storage areas.
 - d. Review all required permits.
 - e. Construction schedule, including sequence of critical work.
 - f. Designation of responsible personnel.
 - g. Contract Documents, including distribution of required copies of Drawings and revisions.
 - h. Processing of Shop Drawings and other data submitted to the Consultant for review.
 - i. Processing of field decisions and Change Orders.
 - j. Rules and regulations governing performance of the work including working hours, use of premises, Owner rules and requirements.
 - k. Parking availability.
 - 1. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

5. PROGRESS MEETINGS

- A. Will be scheduled by Consultant weekly or as described at the pre-construction meeting.
- B. Minimum Attendance: Owner, Contractor's Representative, Job Superintendent, Consultant, and Sub-Contractors, as appropriate.

1. Minimum Agenda:
 - a. Review and correct minutes of the previous progress meeting.
 - b. Review of Work progress.
 - c. Field observations, problems, and decisions.
 - d. Identification of problems which impede planned progress.
 - e. Maintenance of progress schedule.
 - f. Corrective measures to regain projected schedules if construction is behind schedule.
 - g. Planned progress during succeeding work period.
 - h. Coordination of projected progress.
 - i. Maintenance of quality and work standards.
 - j. Effect of proposed changes on progress, schedule, and coordination.
 - k. Interface requirements.
 - l. Status of any incomplete submittals.
 - m. Deliveries.
 - n. Change orders.
 - o. Documentation of information for payment requests.
 - p. Other business relating to work.
- C. Reporting: Distribute minutes of meetings no later than three working days after each meeting to each party present and to parties who should have been present.

6. **SUBSTANTIAL COMPLETION INSPECTION**

- A. Related section: Section 01770 – Contract Close-Out.

7. **FINAL INSPECTION**

- A. Related section: Section 01770 – Contract Close-Out

2. **PART 2 – PRODUCTS (Not Used)**

3. **PART 3 – EXECUTION (Not Used)**

END OF SECTION 01 31 10 - PROJECT MEETINGS

SECTION 01 33 00
SUBMITTALS

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY

- A. The submittals specified in this section must be submitted at the times specified in this Section and as referenced in related sections of the Construction Documents.
- B. The requirements are in addition to any Submittals required in the Owner's Bidding Requirements.

3. SUBMITTAL PROCEDURES

- A. Coordination of submittals:
 - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
 - 2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
 - 3. By affixing the Contractor's signature or approval stamp to each submittal, he/she certifies that this coordination has been performed.

4. SUBMITTAL DOCUMENTS

- A. All Bidders must submit the following documentation for this Project prior to the award of the bid;
 - 1. Membrane manufacturers' data as specified in Section 07 50 00 if different from the manufacturer specified as the basis for the specification.
 - 2. Roof NAV number for the roofing assembly.
 - 3. Submit List of Subcontractors and Suppliers.
 - 4. Copy of the roofing manufacturer's warranty which meets all requirements of the specified warranty.
 - 5. Individual product identification, including manufacturer's literature and MSDS sheets for all products to be used.
 - 6. Licensed Contractor Letter: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
 - 7. Letter from material manufacturer confirming that all bidding documents have been approved, that the site has been inspected and meets the requirements for suitability, that these Specifications and the Drawing Details are acceptable to them for the deck and surfacing to which they are to be applied, and that the specified warranty shall be provided upon satisfactory completion of the project
 - a. If details for any manufacturer's systems proposed in the Contract Documents are not acceptable to the manufacturer, submit corresponding details proposed for the particular application, together with the manufacturer's reasons for not accepting the conditions depicted in the Specifications or Drawings. No alternate details will be considered without evidence of valid objections on the part of the manufacturer to the Contract requirements.
 - b. No deviation is to be made from this Specification without prior written approval by the manufacturer; submit such approval to the Consultant
- B. Contractor must submit the following documentation for this Project no later than 5 days before start of Work:
 - 1. Shop Drawings:

- a. Metal Fascia and Copings: Show profiles, joining method, location of accessory items, anchorage and flashing details, adjacent construction interface, and dimensions.
 - b. Expansion Joint Details.
 - c. Shop drawings of each item specified that differ from the basis of design specified in the Construction Documents showing layout, profiles, methods of attachment, and joining methods.
 - d. Color samples of metal finishes and sealants for approval by the Owner
 - e. Insulation attachment patterns; Show perimeter, corner and field densities of insulation fasteners and placement, type and spacing of perimeter nailer attachments.
2. Tapered insulation layouts for any roof areas receiving tapered insulation.
 3. Schedule of values.
 4. Construction Schedule.
- C. The following submittals are required before final payment:
1. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.
 1. Close-out submittals as required in Section 01 77 00 – Contract Close-Out.
 2. Warrantees as required in Section 01 74 10 – Warrantees.

2. PART 2 – PRODUCTS (Not Used)

3. PART 3 – EXECUTION (Not Used)

END OF SECTION 01 30 00 - SUBMITTALS

SECTION 01 42 00

REFERENCES

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. GENERAL

- A. The abbreviations and acronyms defined in this section are provided as a convenience and may not be inclusive of all abbreviations and acronyms used in the specifications.

3. DEFINITIONS AND ABBREVIATIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract
- B. "Approved": When used to convey Consultant's action on Contractors submittals, applications, and requests, "approved" is limited to Consultant's duties and responsibilities as stated in the Conditions of Contract.
- C. BMV: Brick masonry unit.
- D. Clean: Shall be construed to mean the level of cleanliness generally provided by skilled cleaners using commercial quality maintenance equipment and materials.
- E. CMU: Concrete masonry unit.
- F. "Directed": A command or instruction by Consultant. Other terms including "requested", "authorized", "selected", "approved", "required", and "permitted" have the same meaning as "directed".
- G. DL: Dead load.
- H. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project.
- I. FCC: Federal Communications Commission.
- J. "Furnish": Supply, deliver, or provide to the Project site, for assembly, installation, and similar operations.
- K. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated".
- L. "Install": Operations and procedures to set materials, components and details referred to in the Contract Documents and Drawings into place for final use.
- M. "Installer": Contractor or another entity engaged by the Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- N. LL: Live Load
- O. PLF: Pounds per linear foot.
- P. "Provide": Furnish and install, complete and ready for intended use.

- Q. “Project Site”: Space available for performing construction activities. The extent of Project Site is shown on the drawings and may or may not be identical with the description of the land on which Project is to be built.
- R. PSF: Pounds per square foot.
- S. PSI: Pounds per square inch.
- T. “Regulations”: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- U. RFI: Requests for information.
- V. Roofing Terminology: Refer to the following publications for terms related to roofing work not otherwise defined in this section.
 - 1. ASTM D 1079: Definitions of Terms Relating to Roofing, Waterproofing, and Bituminous Materials.
 - 2. NRCA Roofing and Waterproofing Manual.
 - 3. Roof Consultants Institute Glossary of Terms.
- W. SF: Square foot.

4. INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made part of the Contract Documents by reference.
- B. Publication dates: Comply with standards in effect as of the date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the more stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Consultant for a decision before proceeding.
 - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are the minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to the Consultant for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.
- E. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and web site addresses are subject to change and are believed to be accurate and up to date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	800-872-2253 202-272-5434
CFR	Code of Federal Regulations Available from Government Printing Office	888-293-6498 202-512-1530

www.access.gpo.gov/nara/cfr

FS	Federal Specification Available from Defense Automated Printing Services //astimage.daps.dla.mil/online	215-697-6257
	Available from General Services Administration www.fss.gsa.gov/pub/fed-specs.cfm	202-619-8925
	Available from National Institute of Building Sciences www.nibs.org	202-289-7800

5. ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in the Gale Research's "Encyclopedia of Associations" or in the Columbia Books' "National Trade and Professional Associations of the US".
- B. Industry Organizations: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in the following list. Names, telephone numbers, and web site addresses are subject to change and are believed to be accurate and up to date as of the date of the Contract Documents.

AAMA	American Architectural Manufactures Association	
ACI	American Concrete Institute/ACI International www.aci-int.org	248-848-3700
AIA	American Institute of Architects (The) www.e-architect.com	202-626-7300
AISC	American Institute of Steel Construction www.aisc.com	800-644-2400 312-670-2400
ALSC	American Lumber Standard Committee	301-972-1700
ANSI	American National Standards Institute www.ansi.org	202-293-8020
APA	APA- The Engineered Wood Association www.apawood.org	253-565-6600
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning Engineers www.ashrae.org	800-527-4723 404-636-8400
ASTM	American Society for Testing and Materials www.astm.org	610-832-9585
AWPA	American Wood Preservers Association www.awpa.com	817-326-6300
AWS	American Welders Society www.aws.org	800-443-9353 305-443-9353
BIA	Brick Industry Association (The) www.bia.org	703-620-0010
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	423-892-0137
CRSI	Concrete Reinforcing Steel Institute	

FM	Factory Mutual System (See FMG)	
FMG	Factory Mutual Global www.fmglobal.com	401-275-3000
ICRA	International Concrete Repair Institute (The) www.icri.org	703-450-0016
LPI	Lightning Protection Institute www.lightning.org	800-488-6864 847-577-7200
MFMA	Metal Framing Manufacturers Association	312-644-6610
MHIA	Material Handling Industry of America www.mhia.org	800-345-1815 704-676-1190
NAAMM	National Association of Architectural Metal Manufactures www.naamm.org	312-332-0405
NACE	National Association of Corrosion Engineers www.nace.org	281-228-6200
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	703-684-0084
NCMA	National Concrete Masonry Association www.ncma.org	703-713-1900
NECA	National Electrical Contractors Association www.necanet.org	301-657-3110
NEMA	National Electrical Manufacturers Association www.nema.org	703-841-3200
NFPA	National Fire Protection Association www.nfpa.org	800-344-3555 617-770-3000
NLGA	National Lumber Grades Authority www.nlga.org	604-524-2393
NRCA	National Roofing Contractors Association www.nrca.net	800-323-9545 847-299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	888-846-7622 301-587-1400
PCA	Portland Cement Association	
PCI	Precast Concrete Institute	
PDI	Plumbing and Drainage Institute www.pdionline.org	800-589-8956 508-230-3516
SDI	Steel Deck Institute www.sdi.org	847-462-1030
SJI	Steel Joist Institute www.steeljoist.org	843-626-1995

SMACNA	Sheet Metal and Air Conditioning Contractors National Association www.smacna.org	703-803-2980
SPIB	Southern Pine Inspection Bureau www.spib.org	850-434-2611
SPRI	SPRI (Single Ply Institute) www.spri.org	781-444-0242
SSPC	Society for Protective Coatings www.sspc.org	800-837-8303 412-281-2331
SWRI	Sealant, Waterproofing, and Restoration Institute www.swronline.org	816-472-7974
UL	Underwriters Laboratories www.ul.com	800-704-4050 847-272-8800

C. Code Agencies: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in the following list. Names, telephone numbers, and web site addresses are subject to change and are believed to be accurate and up to date as of the date of the Contract Documents.

BOCA	BOCA International, Inc. www.boca.org	708-799-2300
IAPMO	International Association of Plumbing and Mechanical Officials (The) www.iapmo.org	909-595-8449
ICBO	International Conference of Building Officials www.icbo.org	800-284-4406

D. Federal Government Agencies

CPSC	Consumer Protection Agency www.cpsc.gov	800-638-2772 310-504-0990
EPA	Environmental Protection Agency www.epa.gov	202-260-2090
FCC	Federal Communications Commission	
GSA	General Services Administration www.gsa.gov	202-708-5082
NIST	National Institute of Science and Technology www.nist.gov	301-975-6478
OSHA	Occupational Safety and Health Administration	202-693-1999

6. REFERENCE STANDARDS

A. General: Standards listed by reference, including revisions by issuing authorities, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviations, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referenced to by authority abbreviation and standard designation

- B. American Society of Civil Engineers - Reference Document ASCE 7-95, Minimum Design Loads for Buildings and Other Structures.
- C. ACI 530 ACI 530-02/ASCE 5-02/TMS 402-02 “Specification for Masonry Structures”, published by the American Concrete Institute, American Society of Civil Engineers, and the Masonry Society.
- D. ACI 530.1 ACI 530.1-02/ASCE 6-02/TMS 602-02 “Specification for Masonry Structures”, published by the American Concrete Institute, American Society of Civil Engineers, and the Masonry Society
- E. American Society of Testing and Materials (ASTM).
 - 1. ASTM A 366 - Standard specification for Commercial Steel (CS), Carbon (0.15 Maximum percent) Cold-rolled.
 - 2. ASTM A 653 – Standard Specification for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galannealed) by the hot dip process.
 - 3. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the hot dip process.
 - 4. ASTM C 90 – Hollow Load Bearing Concrete Masonry Units
 - 5. ASTM C 144 – Standard Specification for Aggregate for Masonry Mortar
 - 6. ASTM C150 – Standard Specification for Portland Cement
 - 7. ASTM C 165 - Compressive strength
 - 8. ASTM C 203 - Flexural strength
 - 9. ASTM C 207 – Standard Specification for Hydrated Lime for Masonry Purposes
 - 10. ASTM C 216 – Standard Specification for Facing Brick
 - 11. ASTM C 270 – Standard Specification for Mortar for Masonry Unit
 - 12. ASTM C 355 - Water vapor permeance
 - 13. ASTM C 404 – Aggregates for Masonry Grout
 - 14. ASTN C 476 – Grout for Reinforced and Non-reinforced Masonry
 - 15. ASTM C 518 - Thermal resistance
 - 16. ASTM C 1177 - Water Absorption
 - 17. ASTM D 41 - Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
 - 18. ASTM D 312 - Specification for Asphalt Used in Roofing
 - 19. ASTM D 610 – Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces.
 - 20. ASTM D 714 - Standard Test Method for Evaluating Degree of Blistering of Paints.
 - 21. ASTM D 1621 - Standard Test Method for Compressive strength of Rigid Cellular Plastics.
 - 22. ASTM D 1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - 23. ASTM D 1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
 - 24. ASTM D 1654 – Standard Test Method for Evaluation of Painted or Corrosive Specimens Subjected to Corrosive Environments.
 - 25. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection
 - 26. ASTM D 2126 – Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
 - 27. ASTM D 2626 - Specification for Asphalt Saturated and Coated Organic Base Sheet Used in Roofing
 - 28. ASTM D 2863 – Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).

29. ASTM D 4586 - Specification for Asphalt Roof Cement, Asbestos Free
30. ASTM D 5147 - Test Method for Sampling and Testing Modified Bituminous Sheet Material
31. ASTM E 84 - Flame spread
32. ASTM E 96 - Water vapor transmission
33. ASTM E 108 – Spread of flame

F. FMG

1. FMG - Loss Prevention Data Sheets 1-7; 1-28; 1-28R; 1-29; 1-29R; 1-49.
2. FMG - (FMRC) Approval Guide - Roof Coverings.
3. FMG Standard 4470 - Approval Standard for Class I Roof Covers.

7. **CODE AND TEST REQUIREMENTS**

A. The roof system which is bid shall have been tested in compliance with the following codes and test requirements.

1. Underwriters Laboratories Class or Warnock Hersey ['A'] external fire classification.
2. FMG Listing: Provide Roofing Membrane, Base Flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class I construction.
 - a. Fire/Windstorm Classification: Class 1A-90
 - b. Hail Resistance: SH

2. **PART 2 – PRODUCTS (Not Used)**

3. **PART 3 – EXECUTION (Not Used)**

END OF SECTION 01 42 00 - REFERENCES

SECTION 01 43 00

QUALITY ASSURANCE

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. COMMUNICATIONS

- A. Requests for information: Contractor shall issue requests for information (RFI's) to Consultant in a timely manner, in writing, preferably by e-mail.
 - 1. Number each RFI.
 - 2. Indicate the latest date by which a response is needed so as not to delay the Work. Allow at least two business days after receipt for a response (complex issues may require longer to research).
 - 3. Maintain a log of RFI's showing status of each.
 - 4. If practicable, include a proposed solution to each issue raised in an RFI.

3. CONTRACTOR AND MANUFACTURER

A. Contractor shall:

- 1. Be experienced in single ply roofing.
- 2. Be acceptable by Owner and roofing material manufacturer.
- 3. Maintain an effective quality assurance program, independent of the activities by the Owner, Consultant, Observers, or manufacturers. Contractor may not rely on Consultants monitoring or on observation services provided by others as a substitute for performing Contractor's own quality assurance program.
- 4. Accept sole responsibility for the quality of the work.
- 5. Notify Consultant orally, followed in writing, of conditions that the Contractor believes will yield unsatisfactory performance, or of items of non-conformity between these Contract Documents and manufacturers specifications or instructions, or of discovered errors and omissions. Failure of Contractor to submit written notification shall be construed as a representation by Contractor that the Contract Documents are acceptable to Contractor, that they are sufficient in scope and detail to indicate and convey understanding of the terms and conditions for performance and furnishing of the Work, and that Contractor reasonably believes the work will perform as intended.
- 6. Correct Work reported to be defective with no increase in cost to the Owner. Once defective Work is reported to the Contractor, that Work shall be considered to require correction until it is actually corrected, regardless of whether it is mentioned again. When a portion of the Work is reported as defective, the Contractor shall promptly investigate the extent to which similar Work has the same conditions. All similar Work shall be considered defective until the full extent of the defective conditions are documented to the Consultant's satisfaction.

B. Roofing manufacturer shall:

- 1. Be an Associate Member in good standing with National Roofing Contractors Association (NRCA).
- 2. Notify Consultant of planned site visits in a timely manner so Consultant can coordinate his site visits to correspond.
- 3. Material manufacturer must supply a representative to perform periodic observations throughout the course of the Project. Written reports must be submitted to the Consultant and copies to the Contractor. Each site visit must be accompanied by a written report.

4. Provide written reports to Consultant summarizing any communication with Contractor regarding any aspect of the Work.
 5. Provide a factory trained technician to attend site meetings and to perform final observations of the roofing system.
- C. Provide specified Warranty upon completion of satisfactory installation of the roofing system.

4. SUBMITTALS

- A. Submit certification by the manufacturer of the system materials used that these Specifications and the Drawing Details are acceptable to them for the deck and surfacing to which they are to be applied.
1. If details for any manufacturer's systems proposed in the Contract Documents are not acceptable to the manufacturer, submit corresponding details proposed for the particular application, together with the manufacturer's reasons for not accepting the conditions depicted in the Specifications or Drawings. No alternate details will be considered without evidence of valid objections on the part of the manufacturer to the Contract requirements.
 2. No deviation is to be made from this Specification without prior written approval by the manufacturer; submit such approval to the Consultant.

2. PART 2 - PRODUCTS

2.1. GENERAL

- A. Comply with Quality Control, References, Contract Documents, and Manufacturer's data. Where conflict may exist, more stringent requirements govern.
- B. Provide Primary Roofing Products for any system other than the specified standard, including each type of roofing sheet (felt), bitumen, adhesives, primers, base flashings, and miscellaneous flashing materials from a single manufacturer, which has produced that type of product successfully for not less than fifteen (15) years. Provide secondary products (insulation, mechanical fasteners, lumber, etc.) only as recommended and/or required by manufacturer of the roof membrane as required for the specified warranty and FMG Approval.

3. PART 3 – EXECUTION

3.1. JOB LOG

- A. Contractor to maintain a daily job log to be kept on site at all times from the pre-roofing conference through project close-out. The job log shall include:
1. Copies of all submittals.
 2. Safety coordinator appointment with emergency telephone numbers; fall protection plan and material safety data sheets for all products.
 3. A field sketch showing areas of work for the day.
 4. Accident reports.
 5. Complaint log, listing complaints received from any party of any nature, and the actions taken and resolution, with dates and names of individuals involved

END OF SECTION 01 43 00 - QUALITY ASSURANCE

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1. PART 1 – GENERAL

1. RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY

- A. Work included: provide for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection. All temporary facilities shall be provided by the Contractor.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water: provided by Owner where available.
 - 2. Electric power: 120 V power only will provided by Owner where available in sufficient amperage, to be distributed by the Contractor. If amperage is insufficient as distributed by the Contractor, the Contractor must re-distribute power or provide his own supplementary power to prevent disrupting power services due to tripped breakers.
 - 3. Sanitary facilities: provided by the Contractor.
- C. Support Facilities include, but are not limited to, the following:
 - 1. Waste disposal services to be provided by the Contractor.
 - 2. Field office, document storage, and miscellaneous services and facilities to be provided by the Contractor, if needed.
- D. Security and Protection facilities include, but are not limited to, the following:
 - 1. Temporary fire protection to be provided by the Contractor.
 - 2. Barricades, warning lights and warning signs to be provided by the Contractor.
 - 3. Environmental protection to be provided by the Contractor.
 - 4. Temporary pavements, walkways and ground protection to be provided by the Contractor.

3. QUALITY ASSURANCE

- A. Regulations: If temporary utilities are utilized, comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
 - 1. Building code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, fire department, and rescue squad rules.
 - 5. Environmental protection regulations
- B. Standards: Comply with NFPA 241 “standard for Safeguarding Construction, Alteration, and Demolition Operations,” ANSI A10 Series standards for “Safety Requirements for Construction and Demolition,” and NECA Electrical Design Library “Temporary Electrical Facilities”.
 - 1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electrical service. Install service in compliance with NFPA “National Electric Code”.

- C. Inspections: If temporary utilities are used, arrange for Authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
 - 1. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not allow hazardous, dangerous or unsanitary conditions or public nuisances to develop or persist on site.

4. PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as necessary as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

2. PART 2 – PRODUCTS

2.1. MATERIALS AND EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Consultant, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended
 - a. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 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.
- B. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- C. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

3. PART 3 – EXECUTION

3.1. INSTALLATION

- A. Use qualified personnel for installation of temporary facilities and utilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work and the Owners use of the site.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities

3.2. TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company and a licensed electrician to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company requirements.
 - 1. Arrange with utility company and the Owner for a time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Toilets: Provide temporary toilet facilities for use during construction. Use of Owner facilities is not permitted.

- C. Waste Collection and Disposal: Collect waste from construction and staging areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.3.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 Consultant.
- B. Temporary Fire Protection: Unless 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. Remove propane tanks from roof daily and place in secure cages. Cages to be located within secure barricades and fencing.
 - 2. Locate fire extinguishers at not less than one extinguisher on each roof at each point of access and near all convenient and effective points where torches are in use.
 - 3. Store combustible materials in fire safe locations.
 - 4. Do not obstruct access to fire hydrants, fire lanes or emergency vehicle access routes, temporary fire-protection facilities, stairways, fire exits, doorways or other emergency exit routes. Do not impede operation of smoke hatches or fire suppression systems. No smoking is allowed on site except in designated areas.
 - 5. Provide supervision of welding operations, heat-producing electrical devices, combustion-type temporary heating units, and similar sources of fire ignition.
 - 6. Provide fire watch whenever torches, welding devices or open flame are in use. Maintain fire watch for one hour after torches are extinguished. Fire watch to include interior and exterior inspection and use of hand held heat detection device to detect any hot spots.
- 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. Erect "snow fence" in addition to standard OSHA Fall Protection barrier around perimeter of W10 to help minimize debris from blowing off the roof area during removal operations.
- E. Temporary Pavements: Provide temporary construction pavements, at unpaved staging areas, consisting of graded and compacted crushed stone materials of size and thickness capable of supporting loads of all construction vehicles, traffic without deforming and rutting. Maintain surface as required.
 - 1. Wider construction vehicles must cross over a public sidewalk and/or curb, provide a temporary concrete ramp (sloped on three sides) from street pavement to top of curb across the width of the construction vehicle access, and replace a portion of the concrete sidewalk with 7" thick reinforced concrete (6.5 sack mix; 5,000 psi; 7% air content; finish to match existing sidewalk) across the width of the vehicle access.
- F. Temporary Signs: Provide temporary weatherproof signs to indicate construction vehicle access and the building it serves.

3.4. OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintain facilities in a neat and orderly fashion and keep in good operating condition during the progress of the Work.
- C. Termination and Removal: Unless the Consultant 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
 - 1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

END SECTION 01 50 00 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

SECTION 01 60 00

MATERIAL AND EQUIPMENT

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials

1. Deliver materials to job-site in new, dry, unopened and well-marked containers showing product and manufacturer's name.
2. Deliver materials in sufficient quantity to allow continuity of work.

B. Storage of Materials

1. Store membrane sheets in dry area protected from water or extreme humidity.
2. Discard rolls which have been flattened, creased, or otherwise damaged.
3. Stack insulation on pallets.
4. Cover all stored materials with tarpaulin top to bottom. Secure tarpaulin.
5. Rooftop storage: Disperse material on roof to avoid structural overloading.

C. Material Handling

1. Handle all materials on site to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

D. Environmental Requirements

1. Do not work in rain, snow or in presence of water.

* * * END OF SECTION 01 60 00 MATERIAL AND EQUIPMENT * * *

SECTION 01 73 10
CUTTING AND PATCHING

1. PART 1 – GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY

- A. Procedures for cutting and patching building surfaces necessary for installation or completion of the Work.
- B. Related Sections include the following:
 - 1. All Divisions 1 through 16.

3. DEFINITIONS

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

4. SUBMITTALS:

- A. Submit a proposal for prior approval, with shop drawings if necessary, describing the procedures for any cutting and patching that is to be performed according to requirements in Section 01330 - Submittals. Provide the following information as a minimum;
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they are necessary.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. Consultants and Owner's Approval: Obtain approval of cutting and patching proposal before performing cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

5. QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
 - 1. Structural concrete.
 - 2. Structural steel.
 - 3. Lintels.
 - 4. Structural decking.
 - 5. Miscellaneous structural metals.

6. Exterior curtain-wall construction.
7. Equipment supports.
8. Piping, ductwork, vessels, and equipment.
9. Structural systems of special construction.

B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems.
7. Electrical wiring systems.
8. Operating systems of special construction.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence that cutting and patching were performed. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Consultant's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
 - a. Processed concrete finishes.
 - b. Stonework and stone masonry.
 - c. Ornamental metal.
 - d. Matched-veneer woodwork.
 - e. Preformed metal panels.
 - f. Roofing.
 - g. Firestopping.
 - h. Window wall system.
 - i. Stucco and ornamental plaster.
 - j. Terrazzo.
 - k. Aggregate wall coating.
 - l. Wall covering.
 - m. HVAC enclosures, cabinets, or covers.

B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

6. WARRANTIES

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.

2. PART 2 – PRODUCTS

2.1. Materials

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

3. PART 3 – EXECUTION

3.1. EXAMINATION

- A. Examine surfaces to be cut and patched; apply sample materials if necessary to confirm color and texture matching before proceeding.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2. PREPARATION

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

3.3. PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing 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 by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- 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 of these Specifications

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. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 10 - CUTTING AND PATCHING

CONTRACT CLOSE-OUT

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. DESCRIPTION

- A. Work included:
 - 1. Provide an orderly and efficient transfer of the completed Work to the Owner.

3. QUALITY ASSURANCE

- A. Prior to requesting inspection by the Owners Representative, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

4. PROCEDURES

A. Substantial Completion:

- 1. All roofing materials and components are in place and water tight according to specifications with alternates approved by Designated Owner's representative and Building Owner.
- 2. Roofing Contractor will notify designated Owner's representative of substantial completion. Within a reasonable time after receipt of notification, the designated Owner's representative will inspect to determine status of completion.
- 3. Should the designated Owner's representative determine that the Work is not substantially completed:
 - a. The Designated Owner's representative will promptly notify the Contractor, giving the reasons therefore.
 - b. Roofing Contractor will remedy the deficiencies and notify the Designated Owner's representative when ready for re-inspection.
 - c. The Designated Owner's representative will re-inspect the Work.

B. Final Completion:

- 1. Designated Owner's representative will prepare and submit a written statement at final completion.
- 2. Certify that:
 - a. Contract Documents have been reviewed;
 - b. Work has been inspected for compliance with the Contract Documents;
 - c. Work has been completed in accordance with the Contract Documents;
 - d. Equipment and systems have been tested as required, and are operational;
 - e. Work is completed and ready for final inspection.
- 3. The Designated Owner's representative will make an inspection to verify status of completion.
- 4. Should the Designated Owner's representative determine that the Work is incomplete or defective:
 - a. The Designated Owner's representative will promptly notify the Contractor, in writing, listing the incomplete or defective work.
 - b. Remedy the deficiencies promptly, and notify the Designated Owner's representative when ready for re-inspection.

5. When the Designated Owner's representative determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make close-out submittals.
- C. Close-out submittals include, but are not necessarily limited to:
1. Project Record Documents described in Section 01720, if part of specification;
 2. Operation and maintenance data for items so listed in pertinent other Sections of these Specifications, and for other items when so directed by the Owners Representative;
 3. Warranties
 4. Evidence of payment and release of liens;
 5. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- D. Final adjustment of accounts:
1. Submit a final statement of accounting to the Owners Representative, showing all adjustments to the Contract Sum.
 2. If so required, the Designated Owner's representative will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.
5. **INSTRUCTION**
- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work.

* * * END OF SECTION 01 77 00 CONTRACT CLOSE-OUT * * *

SECTION 01 74 10

WARRANTY

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. GENERAL

- A. This portion of the specification sets forth the warranty requirements;

3. WARRANTY

- A. Quotations for the base bid will include a 20 year NDL warranty as follows;
 - 1. Provide Manufacturer's 20-year Total System Warranty covering both labor and material with no dollar limitation (NDL). The minimum wind speed coverage shall include a peak gusts rider for 72 mph measured at 33 feet above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
 - 2. Also, provide a two (2) year Contractor's Full System Guaranty covering all materials and labor for work installed under this work. This guaranty shall include all items included under this work, including items installed by the Roofing Contractor.
 - 3. Pro-rated System Warranties shall not be accepted

* * * END OF SECTION 01 74 10 WARRANTY * * *

SECTION 02 05 00

SELECTIVE DEMOLITION AND SALVAGE

1. PART 1 GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. DEMOLITION AND SALVAGE

A. SUMMARY

- 1. This portion of the specification governs the demolition, salvaging (to the extent specified by building owner), and disposal of materials resulting from the demolition.

B. APPLICABLE AREAS:

- 1. Roof Areas to be covered under this section: All.

3. QUALITY ASSURANCE

- A. Protect all adjacent construction including roof areas adjacent to masonry work from damage.
- B. Provide Consultant written notification of any adverse conditions which might affect the performance of the Work or the safety of occupants.
- C. Contractor to maintain structural stability and safety during all phases of construction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Perform Work according to applicable industry standards and comply with local, State and EPA regulations.
- F. All areas removed must be replaced complete with flashings in the same day as removal or before showers or precipitation occurs, whichever comes first.

2. PART 2 - PRODUCTS (NOT APPLICABLE)

3. PART 3 - EXECUTION

3.1. DEMOLITION

- A. Demolition operations shall be performed in such a manner that no damage to existing facilities or injury to persons will result from the performance of the Work.
- B. The contractor shall review and visually survey areas marked for demolition before beginning demolition.
- C. The use of equipment or wrecking devices shall be subject to the approval of building owner; however, such approval does not relieve the contractor of responsibilities described above.
- D. Use of cranes, dumpsters or other impediments to traffic must be confined to hours and locations allowed by the Owner and as described in other sections.
- E. Erect OSHA compliant perimeter fall protection.
- F. Prior to replacement of bad decking, interior supports for ceilings, ducts, light fixtures, pipes, etc that are attached to the deck must be disconnected and be re-supported so that decking can be removed.
 - 1. Should an area of roofing be removed and unexpected bad decking is discovered that must be replaced, the area must be temporarily dried in until supports on the bottom of the deck can be disconnected and re-supported.
 - a. Contractor to maintain EPDM Blankets on site that are large enough to temporarily cover and tie in any section of roofing removed in a single day in the event that roofing operations are halted

due to discovery of unexpected bad decking or due to the performance of medical procedures below.

2. No roofing or decking can be removed over occupied space. Coordinate with Owner to work over vacated spaces.
 - a. Cordon off the interior area under the area to be replaced.
 - b. Maintain a floor guard in the interior area during all deck replacement activity to keep all pedestrians from entering the area.
 - c. Floor guard to be in communication with roofing crew above at all times
- G. Tear off of roofing, use of cutters, saws or other power equipment on the roof is restricted to the hours established by local codes and the Owner.
- H. Remove all debris from the premise and dispose of properly. Clean substrate of all debris and contaminants. Deck shall be dry before installation of any subsequent components or materials.

3.2. GENERAL

- A. 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 Consultant
- B. Remove materials to be re-installed in a manner to prevent damage. Store materials in an appropriate manner.
- C. Demolition operations shall be performed in such a manner that no damage to existing facilities or injury to persons will result from the performance of the Work.
- D. The use of equipment or wrecking devices shall be subject to the approval of building Owner; however, such approval does not relieve the Contractor of responsibilities described in this section.
- E. When structural elements are involved or encountered, consult with a structural engineer before removing any element that might cause a structural deficiency. Cost of structural engineer to be borne by the Contractor.
- F. Temporarily relocate mechanical systems, electrical systems, signage or other encumbrances in the work area to prevent damage or loss of function.

3.3.SHORING AND SUPPORT

- A. Provide shores as required to support decking to control deflections and maintain structural integrity. Place shores to support dead load and live load.
- B. Provide support to elements connected to the underside of any decking that is to be removed. Disconnect support elements from the decking before removal and re-connect to alternative supports or back to the decking once it has been replaced.

3.4.POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
 2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
- B. Use tack pads and protect floors at entrances to all roof areas.
- C. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent

3.5.PREPARATION

A. Protection:

1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to owner.
2. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
3. Openings in decking must be covered when work is not in process at the opening
4. Roofing, flashings, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather, whichever comes first.
5. Drains are to be water tested prior to beginning of roof removal. Clogged drains are to be reported to the Owner immediately.
6. At start of each workday, drains within daily work area shall be plugged. Plugs to be removed at end of each workday or before arrival of inclement weather.
7. At end of each working day, partial installation shall be sealed with water stops along edges to prevent water entry.
8. Preparation work shall be limited to those areas that can be covered with installed roofing material complete with flashings on same day or before arrival of inclement weather, whichever comes first.
9. Provide at site, prior to commencing removal of debris, a dumpster or dump truck to be located where directed by Owner, and in accordance with City and Owner requirements. Remove debris from the roof as it is removed. Debris stored on roof areas must be dispersed and not exceed allowable live load limitations. Remove dumpster from premises each day, or as required by city ordinance or Owner requirements and empty at approved dumping or refuse area. Spilled or scattered debris shall be cleaned up immediately. Removed material to be disposed from roof as it accumulates. Dumpsters to be covered with tarps to minimize dust.
10. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.

B. Surface Preparation, during the hours allowed by the Owner;

1. Remove roofing, insulation, nailers, flashings, to the deck.
2. Remove deteriorated metal deck and deteriorated lumber.
3. Remove all base flashings. Remove all counter flashings and metal flashings.
4. Remove unused equipment as designated by building owner's representative.
5. Dispose of all materials unless designated by building owner's representative for re-installation or salvage.
6. Sweep roof substrate clean. Dirt, gravel, and foreign materials on the deck areas not acceptable.

3.6 SALVAGE

- A. Material as specified and recovered from demolition operations shall remain the property of building owner. With the owner's permission, other materials shall become the property of the contractor. Material salvaged for building owner shall be placed in storage areas designated by building owner. Material that is not salvaged for building owner shall be removed from the site or discarded in an on-site disposal area designated by building owner.

* * * END OF SECTION 02 05 00 DEMOLITION AND SALVAGE* * *

SECTION 05 31 00
STEEL ROOF DECK

1. PART 1 - GENERAL

1.1.RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

1.2.SUMMARY:

- A. Metal deck repairs shall be done as required to create a sound substrate for new roof installation. Deck repairs may only be done with the written approval of the Consultant or Owner.
- B. Scope of Work:
1. Test cuts must be made to estimate whether any decking must be removed prior to beginning removal operations. If deck replacement is likely, removal must be coordinated with Owner as to when the space below can be vacated. See SECTION 02 05 00 SLECTIVE DEMOLITION AND SALVAGE.
 2. Remove or repair all deteriorated decking.
 - a. Deteriorated decking to be restored is defined as: unattached decking, unattached side or end laps and/or presence of minor surface rust not severe enough to require replacement. Each roof area has a specified area of deck restoration included in the base bid. These areas will be added to or subtracted from by a single unit price. Restoration includes re-attachment, reinforcement and scraping, and priming rusted areas.
 - b. Deteriorated decking to be replaced is defined as: If any rusted openings exist in any deck section, or if any rust scale exists in any deck section, replace deck. Each roof area has a specified area of deck replacement included in the base bid. These areas will be added to or subtracted from by a single unit price. Replacement includes scraping and priming rusted supports underneath.
 3. Remove all abandoned projections on steel roof deck areas, install new decking as specified.
 4. The Contractor is fully and solely responsible to map out all electrical components or other obstructions secured to the underside of the deck. These components shall be moved or re-secured to the structural steel members as appropriate, and the Contractor must ensure that they are not damaged. If these components need to be disconnected to replace deck, it must be done by a licensed, Owner approved Contractor at no additional cost to the Owner.
 5. Furnish all materials, labor, equipment, and services necessary for and incidental to the execution and completion of the specified work:

1.3.SUBMITTALS

- A. Product data for each type of deck, accessory and product indicated.
- B. Shop drawings:
 - a. Deck profile and gage.
 - b. Methods, types and locations of fasteners.
 - c. Accessory materials and related details required for proper installation of the decking.
- C. Evidence of steel decks compliance with OBC and FMG.
- D. Manufacturers coating certification.

1.4.QUALITY ASSURANCE

- A. Design, fabrication and erection shall conform to:
 1. AISI "Specifications for the design of Cold Formed Steel Structural Members".

2. SDI “Basic Design Specifications”.
- B. The steel deck manufacturer shall be a member of the Steel Deck Institute and shall not have less than five (5) years’ experience in the fabrication of steel deck.
- C. FMG Listing: Provide steel deck evaluated by FMG and listed in FMG’s “Approval Guide, Building Materials” for Class I fire rating and Class I – I 90 windstorm ratings.

1.5.DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation and other damage during delivery, storage and handling.
- B. Stack steel deck on platforms and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
- C. Follow all delivery, storage and handling requirements in SDI “Manual of Construction with Steel Deck, 2nd Edition”.

2. PART 2 - PRODUCTS

2.1.METAL ROOF DECK

- A. FOR METAL DECK AREAS;
 1. Galvanized Sheet Steel: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G90 zinc coating.
 2. Metal roof deck
 - a. All roof areas: Match existing profile and Type- 20 Gage (minimum), Galvanized.
 - b. Rib depth and rib configuration to match existing; all panels to be three span minimum except where closing openings by the removal of small diameter pipes and curbs. Openings around removed pipes and curbs must be supported by structural supports or decking must span joist to joist.
 3. Side laps: Overlapped.
 4. Butt and finish strips: 16-gage sheet steel.
- B. Acceptable manufacturers:
 1. Wheeling Corrugating Co.
 2. United Steel.
 3. Vulcraft.

2.2.ACCESSORIES

- A. Metal roof deck fastener shall be corrosion resistant coated, self-tapping carbon steel screws, No. 12 minimum diameter. Fastener shall project through supporting metal a minimum of ¼ inch and a maximum of ¾ inch.
- B. Side lap fasteners shall be corrosion resistant coated, self-tapping carbon steel screws, No. 10 minimum diameter. Fastener shall project through supporting metal a minimum of ¼ inch and a maximum of ¾ inch.
- C. Column Closures, End Closures, Z-Closures, and Cover Plates: Sheet Steel shall be of the same materials, finish and thickness as deck, unless otherwise indicated.
- D. Recessed sump pans: Single piece sheet steel, 0.0747 inch thick of same material and finish as deck with 3 inch wide flanges and sloped recessed pans of 1-1/ inch minimum depth. For drains cut holes in the field.
- E. Miscellaneous accessories: To be of same material, finish and thickness as deck, unless otherwise indicated.

3. PART 3 – EXECUTION

3.1.GENERAL

- A. Locate decking bundles to prevent overloading of structural members.
- B. Remove areas of deteriorated deck. Cut deck so opening is square and so new piece of deck is structurally supported at three points.

- C. Install temporary shoring before placing panels, if required to meet deflection limitations.
- D. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- E. Cut and neatly fit deck panels and accessories around openings and other work projecting through the deck.
- F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking and support of other work.
- G. Position deck panels so that fasteners penetrate end laps no more than 2 inches and not less than one inch from end of overlapping metal. End laps shall not be less than 3 inches.
- H. The threads of self-drilling screws shall penetrate through supporting members a minimum of ¼ inch and a maximum of ¾ inch.
- I. Screws with stripped threads shall be removed and discarded. Removed screws will be replaced with a larger screw of the same material and thread characteristics as that specified.

3.2. STEEL DECK REPAIR AND INSTALLATION

- A. When deck replacement occurs, the Contractor must perform the following as a minimum:
 - 1. If conduits, wires, cables, electrical boxes, duct or ceiling supports, etc. are attached to the bottom of the deck to be replaced, they must be removed before deck removal and reinstalled after deck replacement.
 - 2. Cordon off the interior area under the area to be replaced.
 - 3. Maintain a floor guard in the interior area during all deck replacement activity to keep all pedestrians from entering the area.
 - 4. Floor guard to be in communication with roofing crew above at all times.
 - 5. All cordoning materials and debris must be removed from the interior of the building after completion of roof deck installation. Clean up must meet with Owner's satisfaction.
- B. Deck Repair:
 - 1. Deck Protection: Scrape or wire brush to remove all rust from deck panels and underlying support members when exposed during replacement. Apply rust inhibitive paint over removed surface rust.
 - 2. Deck Reinforcement: After deck protection is completed; install sheet steel reinforcement profiled to existing decking configuration over all rusted areas.
 - 3. Deck Reattachment:
 - a. Mechanically reattach loose sections of deck to steel support members twelve inches on center.
 - b. Side laps: Nestable side lap: Mechanically fasten 18 inches on center.
- C. Deck Replacement:
 - 1. Saw cut at bar joist/beam center, remove decking. Cut decking so that opening is squared off. Minimum length: Three spans.
 - 2. Examine supporting frame for compliance with conditions that may affect performance. Wire brush or scrape all rust off framing members and paint with rust inhibitive paint.
 - 3. Remove all abandoned projections on steel deck areas. Cut decking to be removed so that remaining hole will be squared off and so that new decking will be supported by at least three points. Unit removal included in base bid.
 - 4. Erect metal decking according to SDI Design Manual.
 - 5. Mechanically fasten end laps 12 inches on center across the width of the panel. One fastener shall always be placed in a side lap as a minimum. End laps shall always be a minimum of 2 inches and shall always occur over a supporting member.
 - 6. Mechanically fasten side laps 18 inches o.c.

7. Fasten deck to steel support members at ends and intermediate supports with mechanical fasten twelve inches o.c. maximum.
8. Install six inch wide sheet steel butt strip where deck ends butt. Mechanically fasten butt strips to steel deck six inches o.c.
9. Accessory material shall be fastened not more than 12 inches on center. Sump pans shall be properly fastened to adjacent sheets to properly reinforce the opening.
10. Roof deck shall be installed so that all deck sheets will lie true in line with all interlocking edges parallel. When the edge of a 4 foot long straight edge is placed on the deck perpendicular to the ribs, the straightedge must contact all or part of the top surfaces of the deck.
11. Roof deck shall be set in place against the supporting steel and holes shall be installed perpendicular to the panels, through both the panels and the supporting steel simultaneously.

3.3.REPAIRS AND PROTECTION

- A. Galvanizing repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturers written instructions.

END OF SECTION 05 31 00 - STEEL ROOF DECK

SECTION 06 10 00

WOOD FRAMING

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

1.2. SUMMARY:

- A. This portion of the specification sets forth the general requirements, including the quality and type of materials required for the installation of all lumber used for wood curbs, nailing strips, miscellaneous blocking material, unexposed fillers, fascias, edging strips, etc.

- B. APPLICABLE ROOF SECTIONS:

- 1. Roof Areas to be covered under this section: all

- C. Scope of Work:

- 1. Rotted, deteriorated and/or warped wood nailers and blocking are to be removed and replaced. Use fire treated lumber where specified.
 - 1. Raise all curbs to minimum height specified.

4. STORAGE:

- A. All material specified herein shall be stored (after delivery to the site) so that it will be fully protected from damage and weather, and shall be piled to prevent warpage. All lumber shall be fully protected to maintain the original required moisture content as specified in item titled "Moisture Content".

5. PERFORMANCE REQUIREMENTS

- A. Installation of wood blocking and nailers must comply with FM Global requirements listed below:

- 1. FMG rating 1-90, Class A
 - 2. FMG Loss Prevention Data Sheet 1-49
 - 3. FMG Approvals 4450
 - 4. FMG Approvals 4470
 - 5. FMG Approvals "RoofNav"
 - 6. FMG Data sheets 1-28 and 1-49

- B. Minimum withdrawal resistance of wood blocking fasteners will be 180 lbs per fastener as required by FM 1-49

6. OTHER REQUIREMENTS:

- A. Dimensions indicated on the drawings are nominal dimensions (except where details show actual sizes) and shall be subject to the standard reductions required for surfacing or tolerances permitted by the grading rules.

7. PROTECTION:

- A. All finished work shall be adequately protected against damage from any source.

2. PART 2 - PRODUCTS

2.1. WOOD PRODUCTS –GENERAL

- A. Certified Wood: Lumber and plywood shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship"

2.2. WOOD - FRAMING AND CURBS

- A. Lumber: Southern Pine, yellow pine, Douglas fir, spruce, ponderosa pine, larch or Hemlock and shall meet the following minimum grade requirement of construction standard (75% #1 and 25% #2); free from warping and visible decay. Lumber shall be graded according to the standard grading rules of the Southern Pine Inspection Bureau, the West Coast Lumber Inspection Bureau, or the Western Wood Products Association.

2.3. MOISTURE CONTENT

- A. All lumber shall be air-dried or kiln-dried before treatment, so that the moisture content is not more than 19%. After treatment, it shall be kiln-dried at temperatures not exceeding 160 degrees F. (71 degrees C) so that the moisture content is not more than 19% at time of shipment.

2.4. GRADE STAMPS

- A. Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grades, species, moisture content at time of surfacing and mill.

2.5. WOOD PRESERVATIVE TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC3b for exterior construction not in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 2. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

2.6. FIRE RETARDANT-TREATED MATERIALS

- A. General:
 - 1. Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency
 - 2. Install fire retardant lumber to raise curb heights and at any location with a direct interior exposure or where required by applicable codes.
- B. Material shall comply with applicable requirements of AWWA C20 (lumber) and AWWA C27 (plywood). Identify fire retardant treated wood with appropriate classification marking of UL.

2.7. PLYWOOD

- A. Grade: APA B-C EXT – Douglas Fir – four ply.
- B. Description: 1/2" thick.

2.8. FASTENERS:

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners"
 - 1. Power-Driven Fasteners: NES NER-272.
 - 2. Wood Screws: ASME B18.6.1.
- D. Screws for Fastening to Metal Framing: ASTM C 1002 ASTM C 954, length as recommended by screw manufacturer for material being fastened.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6).

- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).
- H. Should lumber treated with ACQ (Ammonia Copper Quaternary) be used, fasteners should be Type 304 or Type 316 stainless steel fasteners or hot-dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185. Carbon steel, aluminum, electroplated galvanized steel should not be used with ACQ treated lumber
- I. WOOD TO METAL
 - 1. Coated metal screw fasteners, acceptable Manufacturers:
 - a. Buildex Div. of ITW Itasca, IL
 - b. Olympic Manufacturing Group Inc. Agawam, MA
- J. WOOD TO WOOD FASTENERS:
 - 1. Type: Galvanized, common, annular ring nail. Length: Sufficient to penetrate underlay blocking 1-1/4 inches.
 - 2. Acceptable Manufacturers:
 - a. Buildex Div. of ITW Itasca, IL
 - b. Olympic Manufacturing Group Inc. Agawam, MA
- K. WOOD TO MASONRY OR CONCRETE FASTENERS:
 - 1. At interior locations:
 - a. Masonry screws, acceptable Manufacturers:
 - i. Tapcon or equal
 - b. Length: As recommended by manufacturer.
 - 2. At exterior wall perimeter locations, lag bolts set in epoxy grout or masonry screws though 5/8 inch diameter washers to meet FM 1-49 requirements.
 - a. Lag Bolts: ASME B18.2.1.

3. PART 3 - EXECUTION

3.1.REMOVAL

- A. Remove all existing lumber except exhaust fan curbs that are not deteriorated or rotted.
- B. All lumber to be installed as specified and as indicated on the Drawings.

3.2.GENERAL

- A. Install all lumber plumb, true and level.
- B. Trim and fit all carpentry to other construction, fasten and anchor securely as required to meet specified standards.
- C. All lumber must be attached to support applied loads and to resist movement in any plane.

3.3.INSTALLATION - GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated

- B. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- C. At roof edge to receive metal fascia, around all roof top penetration perimeters, and under any flashing component that is to have a roof flange mechanically fastened to roofing substrate;
 - 1. Mechanically attach wood blocking. Blocking thickness: Equal to final insulation thickness. Width: Six inches nominal, or as otherwise required.
 - 2. Fasteners attaching wood to substrate shall be installed to conform to FMG 1-90 standards.
 - 3. Where required, offset blocking layers twelve inches, weave corners.
 - 4. Lumber shall be accurately cut to the work requirements.
 - 5. Bolted fastenings shall have washers of adequate size under both heads and nuts. Nails shall be of correct size and quantity for proper fastening. Oversized nails that will result in splitting shall not be used. All fasteners shall be galvanized per ASTM A 153.
- D. All lumber to be covered with waterproofing materials at end of each day's work.

3.4. PERIMETER COPINGS AND EDGES

- A. Install new lumber according to FMG 1-90 requirements and Data sheets 1-28 and 1-49.
 - 1. Install fasteners with 5/8 inch diameter washers in two rows of fasteners spaced no greater than 24 inches on centers. Space the two rows of fasteners approximately 4 inches apart. . The fastener head and washer must be countersunk into the wood so that they are below the top of the wood nailers.
- B. Install lumber with sufficient width to accommodate coping and edge installation.

3.5. WOOD CURBS AND RAISING OF UNITS

- A. Raise all curbs and supports to achieve a minimum 8 inch flashing height above the finished roof surface:
 - 1. Disconnect all electrical conduits, condensate lines, etc. Hire licensed HVAC and electrical subcontractors as approved by Owner to perform all work, including reconnection work. If HVAC or gas lines need to be drained and recharged, those costs shall be included in the contract. Coordinate with Owner for times when equipment can be shut down.
 - 2. All lumber to be fire treated.
 - 3. Wood shall be cut to size to match up with existing curb. Secure all new lumber to existing curb. Space fasteners 8 inches on center. Where multiple layers are required, offset blocking layers twelve inches, weave corners. Install nailers at base of curb as required by manufacturer.

END SECTION 06 10 00 - WOOD FRAMING

SECTION 07 21 00

ROOF INSULATION

1. PART 1 - GENERAL

1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY:

- A. This portion of the specification describes materials and workmanship required for the installation of insulation over structural decks.
- B. All materials described herein shall be furnished and installed by the roofing Contractor unless specifically noted otherwise.
- C. Roof Areas covered under this section: Roof areas; all.

3. PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Insulation shall be delivered to the site in an undamaged and dry condition. Material received that is not dry or is otherwise damaged shall be rejected.
- B. Storage under polyethylene or similar non-breathing film stock shall not be permitted.
- C. Proper storage on or off the site shall be the responsibility of the roofing Contractor.
- D. Any unused insulation remaining on the roof at the end of the workday shall be returned to storage.

4. SUBMITTALS

- A. Tapered insulation design has not been done for roof areas that are denoted as areas to receive tapered insulation, crickets or saddles. The Contractor is to submit shop drawings of tapered insulation that is approved by the membrane manufacturer and that will ensure that each roof area that will not have the roof surface sloped with new insulation will positively drain after the new roof system is installed. The Contractor shall conform all new insulation to the slopes of the existing deck and saddles to ensure that drainage is not impaired by the roof system installation.
- B. 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.
- C. Provide documentation that shows that the roofing system to be installed is UL-Classified or FMG-approved, as applicable; include data itemizing the components of the classified or approved system and FMG Roof NAV identification number.

5. INSULATION - GENERAL

- A. All insulation materials must be approved by the manufacturer of the primary roof membrane materials. Samples should be provided to the manufacturer and written approval from the manufacturer is required before ordering these materials for the project.
- B. Insulation boards shall be full size except when cutting is required at roof edges and openings. Boards that are broken, cracked, have been exposed to moisture, or are otherwise damaged shall not be used.
- C. The proper installation and fit of wood nailers, blocking, and other rough carpentry in appropriate locations shall be verified prior to installation of roof insulation.
- D. Caution shall be exercised with construction traffic to avoid damage to new insulation. Breaking or crushing of insulation is unacceptable and any damaged insulation shall be replaced at the roofing Contractor's expense.

- E. Insulation shall be laid with end joints staggered and all joints tight; however, boards shall not be forced into place.
- F. No more insulation shall be installed during any work period than can be covered by the base ply of roofing during the same work period. At the end of the work period, temporary edge seals shall be installed to protect the roof insulation. Upon resumption of work, they must be removed. Such seals shall consist of strips of roofing felt applied and top coated with asphalt mastic.
- G. Insulation surfaces shall be cleared of all debris before roofing is placed.

2. PART 2 - PRODUCTS

2.1. INSULATION

- A. Polyisocyanurate Insulation (all roof areas):
 - 1. All layers: Polyiso ASTM C 1289, Type II, PSI: 20; coated glass facers, type: Class 2 on both major surfaces. Thickness; **TO PROVIDE MINIMUM TOTAL R VALUE OF 25 using two (2) layers minimum.**
 - a. Manufacturers:
 - i. Carlisle – Basis of Design.
 - ii. Firestone Building Products.
 - 2. Flat stock insulation (where deck provides slope), thickness: two layers to equal minimum total of R25 with coverboard included.
 - 3. Tapered Polyiso System (where deck is sloped less than 1/4" per foot): ASTM C 1289, Type II, PSI: 20; coated glass facers, type: Class 2 on both major surfaces; Slope equals: 1/4" per foot; **R-value = 25 average total system.**
 - a. Manufacturers:
 - i. Carlisle – Basis of Design.
 - ii. Firestone Building Products.
 - 4. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated on submitted drawings for sloping to drain. Fabricate to slopes indicated.
 - a. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Saddles and crickets to be sloped 1/2" per foot between drains, under support rails, and where ever else indicated or required to provide positive slope.
 - b. Slope as indicated on submittal drawings approved by manufacturer; provide average R-value of 25 on structurally flat roof area; place tapered layer on bottom, minimum 1/4" per foot slope as needed, 1/2" per foot at saddles.
 - 5. 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.
 - a. Attachment: as required by the specified manufacturer's and approved by FMG (application rate for 4' X 8' boards of 16 fasteners in field, 24 fasteners in perimeter, and 32 fasteners in corners)

6. WOOD BLOCKING

- a. As specified in Section 06 10 00 Wood Framing.

3. PART 3 - EXECUTION

3.1. INSPECTION AND CONDITION OF DECK

- A. Prior to installing insulation, deck must be inspected and accepted by the roofing Contractor and roofing system manufacturer. Contractor must verify deck slopes and determine if insulation stops and/or back nailing is required by the manufacturer based on the system being installed and if fill insulation is required to provide positive drainage of completed roofing system. All deficiencies must be corrected prior to start.
- B. The roofing Contractor shall perform all other work of preparing the deck. When insulation is applied, the deck shall be dry and free of dew, frost, ice, and snow.
- C. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- D. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- E. Install tapered insulation under area of roofing to conform to slopes indicated.
- F. The roofing Contractor shall notify the Consultant of any improper installations.

3.2. THERMAL INSULATION

- A. All layers shall be secured to meet FMG I-90 requirements according to membrane manufacturer's FMG listings and 72 mph wind speed warranty requirements. Refer to FMG Loss Prevention Data Sheet 1-29 for increased fastening requirements at perimeter and corners.
 - 1. Install specified thicknesses of insulation under area of roofing. Install fill layers under tapered insulation as necessary to achieve slope requirements. Where overall insulation thickness is 2 inches (50 mm)] or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
 - 2. Weight the corners and centers of the boards as required to ensure insulation is firm under foot.
 - 3. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - 4. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - 5. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - 6. Insulation Attachment for all areas: Attach each layer of insulation to substrate in accordance with the requirements in Section 07 53 00 1.3.B.3 to resist uplift pressure at corners, perimeter, and field of roof for specified Windstorm Resistance Classification and as follows:
 - 1. All layers: Fastened

- B. Insulation Attachment Products: Insulation Attachment Products and their performance in the roofing system are to be included in and covered by the requested roofing system warranty.
- C. Insulation installation requirements:
 - 1. Firmly butt each insulation board to surrounding boards. Do not jam or deform boards.
 - 2. Maximum elevation variation between boards at joints: 1/8 inch.
 - 3. Cut and fit insulation boards where roof deck intersects vertical surfaces. Cut board 1/4 inch from vertical surface.
 - 4. All boards installed shall be 18 inches in length or width, minimum.

3.3.DEAD MAN FILLERS

- A. Install "dead man" fillers at the end of each day's work before installing temporary tie-ins.
- B. Remove tie-ins and dead man fillers at the beginning of the next day's work.
- C. Replace dead man fillers with permanently installed layers to maintain consistent stagger of board joints throughout the job.

3.4.TAPERED EDGE INSTALLATION

- A. Tapered edge strips shall be adhered with the manufacturer approved insulation adhesive.

- B. Tapered edge strips are to be installed around all drains to form a continuous 48-inch square sump.
- C. Tapered edge strips shall be used at perimeter roof edge where nailer and gravel stop is raised.

3.5.CANTS

- A. Cant strips shall be installed at all 90-degree angles where the horizontal installation of insulation meets the vertical sides of roof penetrations and walls if required by the manufacturer. Cants must be installed prior to application of membrane and flashings.

END OF SECTION 07 21 00 - ROOF INSULATION

SECTION 07 53 00

ADHERED EPDM ROOFING

1. PART 1 - GENERAL

1. RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

2. SUMMARY

- A. This Section includes the following:
 - 1. Adhered membrane roofing system.
 - 2. Roof insulation.
- B. Related Sections include the following, if applicable:
 - 1. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counter flashings.
 - 2. Division 7 Section "Joint Sealants."
 - 3. Division 15 Section "Plumbing Specialties" for roof drains.

3. DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. PERFORMANCE REQUIREMENTS
 - 1. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
 - 2. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
 - 3. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG
 - a. Fire/Windstorm Classification: Class 1-90
 - b. Hail Resistance: SH
 - 4. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated per;
 - a. ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies".

4. SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Tapered insulation, including slopes, if utilized in project (refer to roof drawing).
 - 2. Insulation fastening patterns.

- C. Licensed Contractor Letter: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified.
- E. Maintenance Data: For roofing system to include in maintenance manuals.
- F. Warranties: Special warranties specified in this Section.

2. PART 2 - PRODUCTS

2.1. MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.
 - 3. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 EPDM ROOFING MEMBRANE

- A. Furnish Sure-Seal 60-mil EPDM (Ethylene, Propylene, Diene Terpolymer) in the largest sheet possible with 3" or 6" Factory-Applied Tape (FAT). The membrane shall conform to the minimum physical properties of ASTM D4637. When a 10 foot wide membrane is to be used, the membrane shall be manufactured in a single panel with no factory splices to reduce splice intersections:
 - 1. Manufacturers:
 - a. Carlisle – Basis of Design.
 - b. Firestone Building Products.

2.3 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
- B. Fasteners, Plates and Bars**
 - 1. **HP- Fasteners:** a threaded, #14 fastener with a #3 Phillips drive used with steel roof decks.
 - 2. **HP Term Bar Nail-Ins:** A 1-1/4" long expansion anchor with a zinc plated steel drive pin used for fastening the Carlisle Termination Bar or Seam Fastening Plates to concrete, brick, or block walls.
 - 3. **Substrate Board Fastening Plates:** a nominal 3 inch diameter plastic or metal plate used for insulation attachment.
 - 4. **Sure-Seal Pressure-Sensitive RUSS™** (Reinforced Universal Securement Strip): a 6" wide, nominal 45-mil thick clean, cured black reinforced EPDM membrane with 3" wide SecurTAPE laminated along one edge. The 6" wide Pressure-Sensitive RUSS is used horizontally or vertically at the base of walls, curbs, etc., in conjunction with 2" diameter securement plates or bars below the EPDM deck membrane for additional membrane securement.
- C. ADHESIVES, CLEANERS AND SEALANTS;**
 - 1. **Solvent-Free Bonding Adhesive:** A solvent free, odor free, non-flammable, low VOC Bonding Adhesive used to adhere non-reinforced EPDM to multiple substrates. This one-sided application adhesive require adhesive to be applied to substrate only, when slopes are less than 1", slopes greater than 1" or vertical substrates may require 2-sided application. When the solvent-free adhesive use is to be specified, authorized applicators must review applicable product installation information listed on the appropriate Product Data Sheet.
 - 2. **Weathered Membrane Cleaner:** A clear, solvent-based cleaner used to loosen and remove dirt and other contaminants from the surface of exposed EPDM membrane (for repairs, etc.) prior to applying

EPDM Primer. Weathered Membrane Cleaner can also be used when applying Splicing Cement. Available in 1 and 5-gallon pails.

3. **Low-VOC EPDM Primer** - A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with SecurTape or Pressure-Sensitive products. Available in 1 gallon pails.
 4. **Lap Sealant:** A heavy-bodied material used to seal the exposed edges of a membrane splice. Available in tubes; Sure-Seal Lap Sealant is a black sealant for use with Sure-Seal (black) Roofing Systems.
 5. **Water Cut-Off Mastic:** A one-component, low viscosity, self wetting, Butyl blend mastic used to achieve a compression seal between the EPDM membrane or Elastoform Flashing and applicable substrates. Available in tubes.
 6. **One-Part Pourable Sealer:** Available in black or white, a one-component, moisture curing, elastomeric polyether sealant used for attaching lightning rod bases and ground cable clips to the membrane surface and as a sealant around hard-to-flash penetrations such as clusters of pipes.
- D. Bonding Adhesive: Manufacturer's standard bonding adhesive.
- E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, a 1" wide and .098" thick extruded aluminum bar pre-punched 6" on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.4 WALKWAYS

- A. Protective surfacing for roof traffic shall be Sure-Seal (black) Pressure-Sensitive Walkway Pads (with Factory-Applied Tape on the underside of the walkway) adhered to the membrane surface in conjunction with Sure-Seal Primer.

3 PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations.
 3. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263
 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 ADHERED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

- B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
- E. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions and coverage rates, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch;
 - 1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
 - 2. Fold back the unbonded half of the sheet and repeat the bonding procedures.
- F. Install adjoining membrane sheets in the same manner, overlapping edges approximately 4 inches. Do not apply bonding adhesive to the splice area.
- G. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- H. Tape Seam Installation:
 - 1. In Seam installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight installation.
 - 2. Cover tape Installation: Clean and prime surface of seam area, apply cover tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.
- I. Repair tears, voids, and lapped seams in roofing that does not meet requirements.
- J. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

3.6 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 3" wide) of both membrane sheets by scrubbing with clean natural fiber rags saturated with Sure-Seal Weathered Membrane Cleaner. When using Sure-Seal (black) PRE-KLEENED membrane, cleaning the splice area is not required unless contaminated with field dirt or other residue.
- C. Apply Low VOC 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. Tape splices must be a minimum of 2-1/2" wide using 3" wide SecurTAPE 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: splice enhancements are required for specified 20 year warranty: Refer to Carlisle Sure-Seal/Sure-White Roofing System Specification.
- F. 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, Carlisle's Stand-Up Seam Roller can be used to roll parallel to the splice edge.

- G. **At all field splice intersections**, apply Lap Sealant along the edge of the membrane splice to cover the exposed SecurTAPE 2” in each direction from the splice intersection. Install Carlisle’s Pressure-Sensitive “T” Joint Covers or a 6” wide section (with rounded corners) of Sure-Seal Pressure-Sensitive Elastoform Flashing over the field splice intersection.

3.7 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with self-adhesive splice tape (factory-applied) according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may, at their option and expense, engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to
 - 1. Notify Consultant or Owner 48 hours in advance of date and time of
- C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

3.10 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Consultant and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

* * * END OF SECTION 07 53 00 ADHERED EPDM ROOFING * * *

SECTION 07 65 10

FLASHING AND SHEET METAL

1. PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

1.2. GENERAL

- A. This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the flashings and sheet metal on the roofing systems specified.
- B. All flashings shall be installed the same day as the roof membrane..
- C. All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.
- D. Work shall be in accordance with Architectural Sheet Metal Manual, latest edition, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

1.3. SOPE OF WORK

- A. Remove all sheet metal components except where designated otherwise in the Drawings.
- B. Install new sheet metal components according to the Specifications and Drawings or as needed to properly terminate the roof system in accordance with referenced standards or manufacturer's requirements, whichever is more stringent.
- C. When new sheet metal covers masonry components below, ensure that at least one full brick is covered unless specified or drawn otherwise.
- D. Install new metal caps on new and existing support curbs and rails.
- E. Clean and paint all ductwork and metal stacks on all roof sections.

1.4. PERFORMANCE STANDARDS

- A. General: Install sheet metal components to withstand wind loads, structural movement, thermally induced movement and exposure to weather without failing.
 - 1. Metal joints and closures shall conform to appropriate SMACNA details.
- B. Flashings, copings and metal edges to be installed to conform to recommendations of FM Loss Prevention Data Sheet 1-49 and be covered by manufacturer's system warranty
- C. All metal installations must comply with Ohio Basic Building Code.

1.5. SUBMITTALS

- A. Shop drawings:
 - 1. Metal Fascia and Copings: Show profiles, joining method, location of accessory items, anchorage and flashing details, adjacent construction interface, and dimensions.
 - 2. Shop drawings of each item specified that differ from the basis of design specified in this section showing layout, profiles, methods of attachment, and joining methods.

- B. Miscellaneous Penetration Flashings: Submit detail to be used to Consultant for approval before proceeding with the Work.
- C. Color samples of finishes for approval by the Owner.

1.6. QUALITY ASSURANCE

- A. Perform work in accordance to ASTM A – 653 and the SMACNA Architectural Sheet Metal Manual.
- B. Obtain Consultants approval of sheet metal details before installation.

2. PART 2 - PRODUCTS

2.1. MECHANICAL FASTENERS

- A. Sheet Metal and steel bar to Masonry
 - 1. Tapcon 1/4 inch diameter, Phillips flat head anchor with EPDM washer by Buildex Div. of ITW, Itasca, IL.
 - 2. Length: Sufficient to provide 1-1/4 inch embedment.
- B. Sheet Metal to Curbs
 - 1. Fab-lok Fac 10-8 stainless steel screw, aluminum sleeve by Fabco Fastening Systems, West Newton, PA.
- C. Base Flashing to Masonry
 - 1. As required by manufacturer.

2.2. METAL FLASHING

- A. Pitch pan and bonnets: Stainless steel: 24 gage - Type 304, ASTM A167
- B. Reglet sealant: One part urethane.
- C. Termination bar: as specified by manufacturer.
- D. Wall Counter lashing Systems: .040" mill finish Aluminum, color to be approved by Owner.
- E. Metal Edge and Copings: as supplied by manufacturer and as indicated in Drawings. Edge/Coping system to be covered by manufacturer's warranty.

3. PART 3 - EXECUTION

3.1. FABRICATION

- A. Form pieces in longest practical lengths.
- B. Hem exposed edges of metal ½ inch, miter and seal corners.
- C. Fabricate vertical faces with bottom edge formed outward ¼ inch and hemmed to form drip.
- D. Form sections that are square, true and accurate in size, free of distortions or defects detrimental to appearance or performance.
- E. Allow for expansion by providing space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped joints are not sufficiently weatherproof, form expansion joints of interlocking hooked flanges filled with sealant concealed in the joint.
- F. Weld, solder, mechanically fasten or crimp metal joints and seal metal Joints. Use concealed splice plates where joints are not soldered or welded.
- G. Fabricate cleats from same material, one gage heavier as material being anchored.
- H. Prevent dissimilar metal contact where possible. This shall include not only bi-metallic joints, but also fasteners that pass through new and existing flashing metals.

- I. Apply self-adhering bituminous backing or asphalt mastic on surfaces in contact with dissimilar materials.

3.2. EXAMINATION

- A. Verify that substrates and conditions are acceptable and ready to receive flashing and sheet metal installation.
- B. Installation of materials implies that Contractor has inspected and accepts the existing conditions.
- C. Examine walls after removal of existing counterflashings and flashings for the presence of weep holes and/or through wall counter flashing. If weep holes and/or through wall counterflashings exist, new flashing and counter flashing must be located below the line of the weep holes and/or through wall counterflashings. If line below weep holes and/or through wall counterflashings is less than 8 inches above the finished roof surface, notify Consultant before proceeding.

3.3. GENERAL INSTALLATION

- A. Furnish and install sheet metal work to provide weatherproof installations warranted against leaks and weather damage and to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual".
- B. Anchor components of the Work securely in place with provisions for thermal and structural movement.
- C. Ensure that sheet metal work presents a finished appearance which is neat, uniform and possessing aesthetic characteristics of good architectural sheet metal work.
- D. When soldering joints of any metal, thoroughly clean the parts to be joined of all grease, dirt or other foreign matter using a clean cloth and solvent. Smooth surfaces should be roughed with clean emery cloth or sand paper, do not use ordinary steel wool.
 1. Perform soldering slowly with well heated base materials so as to thoroughly heat the seam and sweat the solder through its full width.
 2. Thoroughly wash acid flux with a soda solution after soldering and thoroughly rinse. Remove all soldering flux residue on exposed and painted surfaces.
 3. Use ample solder and ensure that seams show at least one full inch of evenly flowed solder. Wherever possible, all soldering should be done in a flat position. Seams on slopes greater than 45 degrees should be soldered a second time.
- E. Prevent dissimilar metal contact where possible. This shall include not only bi-metallic joints, but also fasteners that pass through new and existing flashing metals.
- F. Set sheet metal and trim items level, true to line, and plumb.
- G. Coordinate counter flashing, edge and fascia, equipment support flashing, roof penetration flashing, etc. with the installation of roofing and equipment.

3.4. FLASHING AND ACCESSORIES INSTALLATION

- 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. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
- C. Scuppers: 0.040 Kynar coated aluminum 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 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. Existing Drains: Remove all existing flashings, drain leads, roofing materials and cement from the drain; remove clamping ring.
2. 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.
3. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch of membrane to extend inside clamping ring past drain bolts.
4. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.
5. Apply sealant on top of drain bowl where clamping ring seats below the membrane
6. 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 deep, with at least 1 inch clearance from penetration, sloped to shed water.
3. Structural Steel Tubing: If corner radii are greater than 1/4 inch and longest side of tube does not exceed 12 inches, 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.
5. High Temperature Surfaces: Where the in-service temperature is, or is expected to be, in excess of 180 degrees F, protect the elastomeric components from direct contact with the hot surfaces using an intermediate insulated sleeve as flashing substrate as recommended by membrane manufacturer.

3.5. COUNTERFLASHING

- A. Install counter flashing as indicated in the Drawings.
- B. Sections to be overlapped a minimum of 3 inches.
- C. Seal top edge of all counter flashing with a bead of specified sealant, do not cover weep holes.

3.6. PITCH PANS

- A. Pitch pans and rain collars to be fabricated from 24 gage stainless steel or use manufacturer approved pitch pan molds.
- B. Install pitch pan according to the drawings assuring minimum 2-inch clearance around penetrations.
 1. Provide minimum 6-inch height above finished roofing.
- C. Fill pan with light weight concrete filler to a minimum of 2-inches below the top edge. Seal boxes full with approved pourable urethane sealer acceptable to the membrane manufacturer.
 1. Provide a constant slope to the outside edge of the pan on all sides.
 2. Provide a metal storm collar over all pans.

3.7. RAIN COLLARS AND BOOTS

- A. Install passive stainless steel rain collars and boots around hot stacks according to the Drawings. Secure rain collar with stainless steel draw band and seal top edge with a heat resistant sealant to be approved by the Consultant.

3.8. AT PLUMBING VENTS

- A. Remove existing stack flashing.
- B. Wedge plumbing vent tight against deck.
- C. Install plumbing vent flashing according to manufacturer's specifications

* * * END OF SECTION 07 65 10 FLASHING AND SHEET METAL * * *

SECTION 07 72 00

ROOF ACCESSORIES

1. GENERAL

1.1. RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections.

B. SCOPE OF WORK:

1. Remount lights off of metal edge.
2. Install new lightning protection system according to NFPA and UL standards. Including roof top units (Alternate Bid).
3. Remount electrical lines, conduit, cabling, and gas lines on mounts that do not penetrate roof membrane, flashing or sheet metal components and accommodate new insulation thickness. (Alternate Bid 1)
4. Install new gas line and conduit supports.

1.2. SUBMITTALS

A. Lightning Protection:

1. Shop drawings showing lay out and attachment of lightning protection system and conduit, electrical boxes, etc that are to be re-mounted.
2. Name of individual and proof of certification that he/she is Certified by the LPI as a Master Installer or Master Installer – Designer of lightning protection systems. LPI qualified staff shall provide supervision of the installation to the Standards
3. Product data on components to be installed.

B. Shop Drawings for new support for parking lot lights.

1.3. QUALITY ASSURANCE

A. Comply with SMACNA and NRCA standards.

B. Installer qualifications: Use approved electrical and lightning protection subcontractors for the Work.

C. The entire lightning protection system shall be designed and installed in accordance with:

1. National Fire Protection Assoc. (NFPA) Document # 780
2. Underwriters' Laboratories, Inc. (UL) Standard # 96A
3. Lightning Protection Institute (LPI) Standard # 175

D. Lightning Protection Contractor Qualifications;

1. A firm actively engaged in the installation of Certified Lightning Protection Systems and listed with Underwriters' Laboratories, Inc. and the Lightning Protection Institute shall install the system.
2. The contractor shall furnish a UL Master Label or Letter of Findings upon completion of the installation.
3. The system installation shall be made under the supervision of an LPI Certified Master Installer, and the LPI System Certification shall be delivered upon completion of the installation.

- a. The installation contractor shall have personnel on staff Certified by the LPI as a Master Installer or Master Installer – Designer of lightning protection systems. LPI PART 2 – PRODUCTS

2. MATERIALS GENERAL

2.1. Gas line supports and Conduit;

- A. Prefabricated gas line supports as approved by the roof system manufacturer.
- B. Conduit to be PVC with glued joints. Expansion fittings to be provided based on NEC Table 352.30
 1. PVC conduit support spacing to be as follows:
 - a. ½” –1” conduit 3 ft. o.c.
 - b. 1 ¼”–2” conduit 5 ft. o.c
 - c. ½”–3” conduit 6 ft. o.c
 - d. 3 ½”–5” conduit 7 ft. o.c.
- C. Roof Top Mounts shall be factory fabricated supports for conduits, gas lines, etc as approved by the manufacturer. Mounts shall allow for mechanical anchoring of the lines being supported and shall be set on walk pads or other protection as required by the manufacturer.

2.2. Lightning protection system subject to approval and compliance with specification.

- A. Lightning protection non penetrating mounts and adhesives:
 1. As supplied by Roof membrane manufacturers.

2.3. LIGHTNING PROTECTION SYSTEM

- A. Standard Materials:
 1. All materials shall comply in weight, size, and composition with the requirements of the UL 96 Materials Standards. All equipment shall be UL listed and properly labeled. The system furnished under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection equipment and a member of LPI. Equipment shall be the manufacturer’s latest approved design of construction to suit the application where it is to be used in accordance with accepted industry standards and with NFPA, LPI, & UL requirements.
- B. Acceptable Manufacturers:
 - Beijing Arrow Advanced Technology Co., Ltd. (www.arrow.com.cn)
 - East Coast Lightning Equipment, Inc. (www.ecle.biz)
 - ERICO, Inc. (www.erico.com)
 - Harger, Inc. (www.harger.com)
 - Heary Brothers Lightning Protection Co., Inc. (www.hearybros.com)
 - Independent Protection Company, Inc. (www.ipclp.com)
 - Preferred Lightning Protection (www.preferredlp.com)
 - Robbins Lightning, Inc. (www.robbinslightning.com)
 - Thompson Lightning Protection, Inc. (www.tlpinc.com)
- C. Lightning protection system will comply with the current edition of the National Fire Protection Association – NFPA No. 780.
- D. System shall comply with requirements of L.P.I., U.L., and N.F.P.A. for the type and height of building.
- E. Class I materials shall be used for systems on structures not exceeding 75 feet in height and Class II materials shall be used for systems on structures exceeding 75 feet above grade.
- F. Copper shall be of the grade ordinarily required for commercial electrical work, generally designated as being 95 percent conductive when annealed. Aluminum conductors shall be of electrical grade aluminum.

- G. Lightning protection materials shall be coordinated with building construction materials to assure compatibility. Aluminum lightning protection materials shall not be embedded in concrete or masonry, installed on or below copper surfaces, or used for the in-ground system. Copper lightning protection materials shall not be installed on aluminum surfaces. Copper system components within 2 feet of chimney exhausts shall be tin coated to protect against deterioration.
- H. Strike termination devices shall be provided to place the entire structure under a zone of protection as defined by the Standards. Air terminals shall project a minimum of 10 inches above protected areas or objects. Air terminals shall be located within 2 feet of exposed corners and roof edges.
- I. Metallic bodies having a thickness 3/16" or greater may serve as strike termination devices without the addition of air terminals. These bodies shall be made a part of the lightning protection system by connection(s) according to the Standards using main size conductors and bonding fittings with 3 square inches of surface contact area.
- J. Cable conductors shall provide a two-way path from strike termination devices horizontally and downward to connections with the ground system. Cable conductors shall be free of excessive splices and sharp bends. No bend of a conductor shall form a final included angle of less than 90 degrees nor have a radius of bend less than 8 inches. Structural elements and design features shall be used whenever possible to minimize the visual impact of exposed conductors.
- K. Cable down conductors may be concealed within the building construction or enclosed within PVC conduit from roof to grade level. Down conductors shall be spaced at intervals averaging not more than 100 feet around the protected perimeter of the structure. In no case shall any structure have fewer than two down conductors. Where down conductors are exposed to environmental hazards at grade level, guards shall be used to protect the conductor to a point 6 feet above grade.
- L. In the case of structural steel frame construction, cable down conductors may be omitted and roof conductors shall be connected to the structural steel frame at intervals averaging not more than 100 feet around the protected perimeter of the structure.
- M. Exposed cable conductors shall be secured to the structure at intervals not exceeding 3 feet – 0 inches. Fasteners, nails, screws, or bolts shall be of suitable configuration for the intended application and of the same material as the conductor or of electrolytically compatible materials. Galvanized or plated steels are not acceptable.
- N. Connectors and splicers shall be of suitable configuration and type for the intended application and of the same material as the conductors or of electrolytically compatible materials.
- O. Ground terminations suitable for the soil conditions shall be provided for each download conductor. Where the structural steel framework is utilized as main conductors for the system, perimeter columns shall be connected to the grounding system at intervals averaging 60 feet or less on the protected perimeter. For any structure in excess of 60 ft. in vertical elevation above grade, a ground loop interconnecting all ground terminals and other building grounded systems shall be provided.
- P. Common interconnection of all grounded systems within the building shall be accomplished using main size conductors and fittings. Grounded metal bodies located within the calculated bonding distance as determined by the formulas of the Standards shall be bonded to the system using properly sized bonding conductors.
- Q. Surge suppression shall be provided at every system entrance to the structure to prevent massive lightning over voltages from entering the structure.
- R. Air terminals shall be mounted to extend a minimum of 10 inches above the object being protected. Spacing of air terminals on ridges or edges of roofs shall not exceed 20 feet on center nor be more than 24 inches from the ridge ends or roof edges.
- S. Conductors of the size required by standards shall interconnect all terminals and provide a two way path to ground from each terminal.
- T. All metal bodies permanently attached to the structure that are subject to direct lightning strikes shall be provided with two way paths to the lightning protections using full size conductor. All grounded metal bodies within a zone of protection shall be bonded if they are within the calculated bonding distance for the building(s).
- U. Fasteners shall not be more than three feet apart on each run of exposed conductor. Concealed runs of conductor shall be abhorred as necessary to hold in place permanently.

- V. Compression type connectors shall be used for splices in main conductor runs and branches.
- W. System Certification: Complete UL application for inspection and submit for project inspection by a UL Representative. Correct any deficiencies noted by UL field inspector at no charge to Owner.

3. PART 3 – EXECUTION

3.1. INSTALLATION

A. LIGHTNING PROTECTION INSTALLATION

1. The installation shall comply with the requirements of NFPA 780, UL 96A, and LPI 175.
 - a. All components to be anchored with no penetrating mounts.
2. Lightning Protection Certification
 - a. LPI certification requires a signature by a representative of the owner at three stages of installation – the in-ground system, the concealed portion of the work, and the exposed or roof level section. UL certification requires inspection by their third-party field staff after completion of the installation.
 - b. Upon completion of the lightning protection installation, the installing contractor shall provide to the owner an as-built drawing of the system, along with copies of the UL and LPI Certificates of completion.

B. CONDUIT, PIPES, GAS LINES

1. Attach conduit, junction boxes and cabling to masonry walls or set on non-penetrating roof top supports approved by the manufacturer. Secure conduit to supports.
 - a. Where multiple conduit lines penetrate the roof, install through a pipe/conduit chase as indicated in the Drawings or through curbed opening with separate conduit flashing boots (Portals Plus) installed for each line or separate the lines.
2. Set gas lines on supports as approved by manufacturer. Secure gas lines to supports.

C. LIGHTS

1. Install new mounts for parking lot lights that do not penetrate roof or metal edge components and remount lights.

D. CLEANING AND PROTECTION

1. Clean all exposed surfaces of contaminants.

END OF SECTION 07 72 00 - ROOF ACCESSORIES

SECTION 07 90 00

SEALANTS

1. 1 GENERAL

1.1. RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections

1.2. SUMMARY

- A. Areas of work: all.
- B. Scope of Work:
 - 1. Remove all existing sealant from metal to metal, metal to masonry and masonry to masonry, and metal to glass joints.
 - 2. Properly prepare all joints to receive new sealant and prime according to manufacturer's requirements.
 - 3. Install new sealant in metal to metal, metal to masonry and masonry to masonry joints.
 - a. Work includes:
 - i. Wall joints, joints around metal frames at louvers and doors.
 - ii. Openings around pipes, fasteners, penetrations and holes smaller than ½ inch in masonry walls.
 - iii. Door frames.
 - iv. Termination bars, surface mounted counter flashings.

1.3. QUALITY ASSURANCE

- A. Perform work in accordance with technical publications of SWRI and ASTM C – 1193 and the manufacturers written recommendations.
- B. Test cuts may be made in sealant to determine adhesion, cure, depth and performance of sealant. Contractor will be responsible to repair test cuts. Defective work must be replaced.

1.4. SUBMITTALS

- A. MSDS sheets on all products and primers.
- B. Color charts: Color to be selected by Owner.

1.5. DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials
 - 1. Contractor shall have personnel available for unloading, handling, and delivery to the Work of all materials, equipment, and products. Should materials, equipment, or products arrive at the site without the Contractors personnel being present for unloading, handling, and delivery to the work, the Owner may reject the delivery of these items. All costs incurred because of such rejection of receipt, including returns, storage, re-delivery, etc., shall be borne solely by the Contractor.
 - a. Deliver materials to job-site in new, dry, unopened and well-marked containers showing product and manufacturer's name.
 - b. Deliver materials in sufficient quantity to allow continuity of work.
- B. Storage of Materials

1. Tarpaulins: Provide waterproof, fire resistant, UL labeled tarpaulins with a flame spread rating of 15 or less.
2. Neatly arrange materials in storage to provide access for inspection.

1.6.PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient temperatures exceed manufacturers recommendations for temperature limits.
 2. When moisture of any kind is present.
 3. When joint widths are less than or greater than those recommended by the manufacturer.
- B. Do not proceed with priming or sealant installation until joints are cleaned and properly prepared.

2. PART 2 – PRODUCTS

2.1.Sealant for all other Locations:

- A. Urethane sealant provided by:
 1. Sika Corporation.
 2. Tremco.
- B. Primers: as recommended by the manufacturer
- C. Color: to be selected by the Owner.

2.2.Accessories:

- A. Backer rod: Bi-cellular cylindrical sealant backer rod complying with ASTM C -1330, type B. Size to be sufficient to achieve 25% compression in joint.
- B. Masking Tape: Non-staining, non-absorbent.
- C. Cloth: 100 percent cotton, lint free cloth.
- D. Bond Breaker Tape: Pressure sensitive adhesive polyethylene tape as recommended by sealant manufacturer.

3. PART 3 – EXECUTION

3.1.GENERAL

- A. Verify sealant and primer compatibility with substrate (non-reactive) and adhesion to substrate.
- B. Remove, clean, prime and back no more area than can be sealed in the same day. Take precautions to protect building interior from infiltration of water through open joints that cannot be completed due to unanticipated changes in weather.
- C. Apply masking tape adjacent to joint faces.

3.2.PREPARATION

- A. Remove existing sealant from specified joints. Remove existing sealant residue or exudates to joint faces until free of contamination and laitance.
- B. Install backer rod in joints where required by sealant manufacturers written specifications.
- C. Grind joints with power grinders to clean substrate. Avoid scratching or damaging face of surfaces. Grind edges to clean, smooth, uniform width and profile.
- D. Widen narrow joints if necessary to obtain required tolerances for joint size.
- E. Take precautions to avoid damaging shims and lateral anchors if encountered in the joint.
 1. Grind such obstructions back from substrate surface to a uniform ¼ inch.

2. Butt backer rod up to each side of obstruction and transition between different backing materials with continuous bond breaker tape extending at least 3 inches each side of the obstruction.

3.3.CLEANING

- A. Follow sealant manufacturer's instructions for cleaning.
- B. Wear protective clothing while using solvent.
- C. Clean joint faces with clean cloth and solvent approved by the sealant manufacturer. Remove all dirt, grease, loose materials or water and other foreign matter that might impair adhesion of sealant.
- D. Apply solvent with clean cloth, remove solvent with second clean cloth.

3.4.PRIMING

- A. Apply primer to all substrates to receive sealant. Strictly adhere to sealant manufacturer's instructions for primer.
- B. Do not contaminate primer source container.
- C. Apply primer with paint brush, do not over apply primer, avoid primer drips, runs, skips or voids.
- D. Wipe of excess primer with second clean cloth.
- E. Follow primer manufacturer's recommendations for primer flash and/or dry times prior to sealant application. Re-prime joints that are not sealed the same day as primer application.

3.5.SEALANT APPLICATION

- A. Form joint size and shape in accordance with sealant manufactures recommendations and ASTM standards.
- B. Apply sealant with appropriate pressure to ensure penetration of sealant into required joint depth. Push sealant ahead of nozzle and slightly overfill joints to avoid air voids.
- C. Dry tool sealants smooth and triangular. Do not tool concave.
- D. After dry tooling, joints may be "slicked" with clean potable water. Do not use lubricants, solvents or detergent.

3.6.CLEANING

- A. Remove masking tape immediately after tooling.
- B. Scrape excess sealant off face of substrates with a single edges razor immediately after tooling and before curing, or if more effective, after tooling.
- C. Clean all adjacent surfaces to Owners satisfaction.

END OF SECTION 07 90 00 - SEALANTS

SECTION 15 00 00

ROOF DRAIN CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.
- B. All local, city, state, or other codes required for work in this Section shall apply.

1.2 AREA OF WORK

- A. Roof Areas: all.

1.3 SCOPE OF WORK

- A. Roof Drainage Cleaning: Prior to beginning roof replacement work at each roof area in the scope of the Contract, provide skilled labor and proper equipment to mechanically clean existing roof drains and related storm water pipes in the building. The existing roof drainage system shall be inspected and verified to be flowing freely and clear of any obstructions that would impede full flow capacity. Full roof drainage capacity must be maintained throughout the Project, and the Contractor is fully responsible for damages resulting from water damage resulting from failure to comply with this requirement.

1.4 DRAWINGS

- A. Roof drawings show the approximate location of the existing roof drains. All existing roof drains within the Project scope of work are to be cleaned, whether shown on the drawing(s) or not.

1.5 SUBMITTALS

- A. The Contractor shall certify to the Consultant, in writing, that all roof drains within the Project areas are functioning properly at the beginning and the end of the Project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 CLEANING OF ROOF DRAINAGE SYSTEM

- A. The existing roof drainage system is to be cleaned by means of a high-pressure wash. Any portion of the system that is still not draining at full capacity after the pressure-washing should be cleared by means of a mechanical auger. Drainage components shall be cleaned prior to new roofing installation and new drainage component installations.
- B. Each roof drainage branch shall be cleaned to the point it connects to a vertical storm water drain pipe in the building. The Contractor shall record the location and status of each roof drain on a Roof Plan of the Project area for submission to the Consultant and verify that the roof drainage system has been cleaned as specified.
- C. It is the Contractor's responsibility to notify the Owner and the Consultant immediately of any roof drainage blockage deemed un-clearable and to provide documentation of details of the attempt(s) made to unblock the system as well as an estimate of the distance from top of the roof drain to the point of blockage.

- D. Re-roofing work for each roof area of the Project cannot proceed until the Contractor has completed the drain cleaning work for the affected areas. Any delay(s) to the Contractor's work as a result of the Contractor's failure to comply with the requirements of this Section 15000 shall not be a legitimate cause for any Contractor claim(s) for compensation. The Contractor shall employ any reasonable method to clean the roof drainage system, as approved in advance by the Owner's representative, to clear any blockage without any disassembling of interior storm water plumbing. Any roof drain branch that cannot be un-plugged by the Contractor's means and methods shall be documented by the Contractor, and the Owner will then proceed to verify the blockage and obtain plumbing services to correct the drainage problem(s).

END OF SECTION 15 00 00 – ROOF DRAIN CLEANING

SECTION 15 43 00
PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Documents affecting work of this Section include, but are not necessarily limited to, Drawings and general provisions of the Contract, including General and Supplementary Conditions, Supplemental Owner Conditions, and other Division 1 Specification Sections.

1.2 SUMMARY

- A. This Section includes plumbing specialties for roof drainage systems.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Section 15000 Plumbing - Drain Cleaning
- C. Areas of Work:
 - 1. Roof areas: All
- D. Scope of Work:
 - 1. Lower drains if required to provide drainage during temporary roof installation.
 - 2. Remove clamping rings, inspect bowels for cracks or damage.
 - 3. Install new stainless steel rings and bolts.
 - 4. Install new strainers.

1.3 SUBMITTALS

- A. General: Submit the accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Submit shop drawings of new drain locations and plumbing details.

1.4 QUALITY ASSURANCE

- A. Comply with SAME B31.9, "Building Services Piping," for materials, products, and installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Roof Drain Assembly
 - a. Zurn Industries, Inc..
 - b. Jay R Smith
 - b. Other: U-Flow inserts if required to repair cracked bowels.
- B. Drain components;
 - 1. Body material: Dura-Coated cast iron.
 - 2. Dome material: Dura-Coated cast iron.
 - 3. Bolts: Stainless steel.
 - 4. Dimensions: Match existing dimensional requirements.

2.2 ROOF DRAINS

- A. General: Size outlet as indicated on Product Data Sheet or drawings.
- B. Roof Drains: SAME A112.21.2M, cast-iron body, with combination flashing ring and gravel stop, cast-iron dome except where other dome material is specified, extension collars, under deck clamp, and sump receiver. See Product Data Sheet at end of Part 3 of this Section for dimensions, sump size, dome material, and specific features.
- C. Piping: Cast Iron pipe to match existing pipe, in both size and performance.
 - 1. Schedule 40 pipe must be used as a minimum.

PART 3 - EXECUTION

3.0 DRAIN COMPONENT REPLACEMENT

- A. Remove all existing drain bolts, clamping rings and strainers on all existing roof drains located within the areas of work awarded.
- B. Install new stainless steel drain bolts, including tapping as necessary, painted cast iron clamping rings and painted cast iron strainers on all drains located within the areas or work awarded.

3.1 ROOF DRAIN AND DRAIN REPLACEMENT

- A. Install new roof drains at deck level at locations indicated on roof plans and in accordance with the roof membrane manufacturer's installation instructions. The vapor barrier sheet must be installed to form a seal at the roof drain assembly
- B. Install drain flashing collar or flange to form a watertight seal between roof drain assembly and adjoining roofing.
- C. Install new stainless steel drain bolts, painted cast iron clamping rings and painted cast iron strainers on existing roof drains within the areas or work awarded.
- D. Insulate drains bowls and four feet of drain pipe with jacketed fiberglass insulation to prevent condensation. Install new insulation at existing roof drains if insulation is missing or damaged.
- E. Install under-deck clamps and framing to securely attach the roof drain assembly.

3.1 ROOF DRAIN INSERTS

- C. Install new inserts into cracked bowels or into bowel that have to be cut off to lower for drainage during temporary roof installation as specified in manufacturer's literature.
- D. Install drain flashing collar or flange to form a watertight seal between roof drain assembly and adjoining roofing.

3.3 COMMISSIONING

- D. Preparation: Perform the following checks before water-testing of drain assemblies:
 - 1. Plumbing connections are complete.
 - 2. Components specified to be replaced have been replaced and securely fastened.
 - 3. There is clear space for repairing any leaks.

- E. At project completion, perform these steps:

1. Remove and clean strainers.
2. Perform water-test to verify that new and existing roof drains are flowing properly and that drain piping is clear of obstructions and free of leaks.

3.4 ADJUSTING

- A. Adjust operation and correct deficiencies discovered during commissioning.

3.5 PROTECTION

- A. Protect roof drains during the construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place temporary plugs in ends of incomplete piping at end of work day.

END OF SECTION 15 43 00 - PLUMBING SPECIALTIES