Roofing Project Specifications

Municipal Building Roof
Alternate Roof System

Village of Bridgeview
7500 South Oketo Avenue
Bridgeview, Il. 60455

Roof Areas: East Section

Date of Issue: Later

Mandatory Pre-Bid: Wednesday, January 11th, 10:00 AM

Bid Due**:** Tuesday, January 31st at 4:00 PM

Bid Opening: February 1 at 3:00 PM

THIS DOCUMENT MUST REMAIN INTACT

December 26, 2011

SECTION 001113 – ADVERTISEMENT FOR BIDS

Sealed proposals for the Municipal Building Roof Replacement Project will be received at Village of Bridgeview Village Hall, 7500 South Oketo, Bridgeview, IL 60455, until 4:00 PM on Tuesday, January 31, 2012, and such bids will be publicly opened and read on Wednesday, February 1, 2012, at the same location. The project consists of the general construction for roof areas East Section. Two separate sets of bid documents will be provided for alternative roofing systems, and bidders are required to bid on both systems.

Contract bidding documents will be available on December 29, 2012 on the Village of Bridgeview website: www.bridgeview-il.gov.

On Wednesday, January 11th, at 10:00 AM, a Mandatory Pre-Bid Conference will be held for the purpose of considering questions posed by bidders. The conference will be open to general contract and subcontract bidders and will be held at 7500 South Oketo Avenue, Bridgeview, IL 60455.

Bids shall be submitted on the specified bid form with each set of bid documents. Bids shall be accompanied by a single 10% bid bond, calculated on the value of the higher of the two submitted bids.

The Village of Bridgeview reserves the right to waive informalities and to accept or reject any and all or parts of any and all bids.

No bids may be withdrawn for at least 60 days after the scheduled closing time for receipt of bids. If a bid is withdrawn after opening and before the 60 days, the bidder forfeits the bid bond

Village of Bridgeview
Bill Cronch, Director of Public Works

Advertisement Date: December 28, 2011

END OF SECTION 001113

SECTION 002113 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Related Sections include, General Requirements, bidding documents and drawings.

1.2 MANDATORY PRE-BID

A. Contractors must attend designated pre-bid meeting as part of qualifying as a competent bidder. Only one pre-bid meeting will be held Wednesday, January 11, 2012, at 10:00 AM, at 7500 South Oketo Avenue, Bridgeview, Illinois. Bidding Contractors each must have an employee present as a competent representative to receive direction, present questions, address concerns, and provide information pertinent to the success of proposed project.

1.3 SEALED BIDS

A. Sealed bids will be received until: Tuesday, January 31, 2012, at 4:00 PM for general construction on Roof Areas: East Section.

B. Address envelopes to: Bill Cronch, Public Works Director, Village of Bridgeview, 7500 South Oketo Avenue, Bridgeview, Il. 60455.

C. Write in the lower left corner: Attention: Sealed Roof Bid ROOF CONSTRUCTION AREAS: East Section.

1.4 DEFINITION OF TERMS

A. Whenever "Owner" occurs in Specifications or other documents, it shall mean Village of Bridgeview. Whenever "Contractor" occurs in Specifications or other documents, it shall mean a person, firm or corporation contracting with Owner to supply labor, equipment, and materials specified herein for successful completion of this contract.

1.5 PRE-QUALIFICATION OF BIDDERS

A. Contractors planning to bid will 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.

1.6 SUBSTITUTIONS OF MATERIALS OR METHODS

A. When materials are identified herein, such materials shall be regarded as a "basis of design." Any other make of material will be accepted which is comparably equal to that specified in formulation, quality, workmanship, economy in operation, and suitability for the purpose intended.

B. A bidder offering "equal" materials will be responsible to building owner as to chemical content and performance under laboratory tests of materials he/she intends to use. Materials must comply with standards set forth in PART 2 of each section of this specification. Reports must be submitted to the Owner for approval not less than TEN days prior to Bid Date and show direct comparisons between specified and proposed materials. If testing was done, date, or dates, of testing also must be shown, and tests must have been performed by an independent laboratory for qualitative and quantitative analysis, at no expense to Owner. If approved by owner, all Bidders will be notified by Addendum that proposed materials are accepted as equal for purpose of bidding.

C. If substitute materials are offered, Owner reserves rights to be final authority on their acceptance.

D. During application of materials, contractor must have material suppliers representative present on the job site on at least three different days each week (Owner may require more if its evaluation of job progress deems it necessary) and material manufacturer's employed representative shall make out a written report upon each inspection and a summary report weekly and submit them no later than Tuesday of following week.

E. Material supplier’s representative must be a full-time employee of the material supplier.

F. Upon job completion, a final inspection will be made by material manufacturer's representative and Contractor. No further payments will be authorized for work done until such inspection has been made, and all work that is visible is found to be performed in accordance with the specifications and to satisfaction of building owner.

G. All bids shall be based upon use of type of materials specified herein. Any changes or substitutions require prior approval, in writing, from owner's representative.

1.7 ADDENDUM TO PROPOSAL

A. Owner reserves rights to modify proposal within three (3) days of date for the opening of proposals. All addenda shall be in writing and sent to all bidders having received bid document(s).

1.8 AWARDING OF CONTRACT

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

1.9 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK

A. Bidder is expected to examine carefully site of proposed work, proposal, plans, specifications, supplemental specifications, special provisions and contract forms, before submitting proposal. Submission of bid shall be considered evidence that bidder made such examination and is satisfied as to conditions to be encountered in performing work, and as to requirements of site conditions, plans, specifications, supplemental conditions, special provisions and contracts, and no allowance will be made for lack of knowledge concerning such conditions after contract is signed.

1.10 PREPARATION OF BID PROPOSAL

A. Bidder shall submit his bid proposal upon forms furnished by Owner. All words and figures shall be in ink or typewritten.

B. Bidder's proposal must be signed with ink by one or more members of partnership, or by one or more officers of a corporation, or by an agent of Contractor or legally qualified and acceptable to Owner. If bid proposal is made by an individual, his/her name and business address must be shown; by a partnership, name and business address of each partnership member must be shown; by a corporation, name of state under the laws of which the corporation is chartered and name and title of the officer or officers having authority under bylaws to sign contracts, name of corporation and business address of its corporate official must be shown.

1.11 DELIVERY OF BID PROPOSALS

A. Bid Proposals shall be placed in a sealed envelope so marked as to indicate identity of project and name and address of bidder. Bid Proposals will be received until hour and date set for opening thereof, and must be in hands of the official indicated by such time. Bid Proposals received after time for opening will be returned to bidder unopened.

1.12 WITHDRAWAL OF PROPOSALS

A. Bidder may withdraw his/her bid proposal, provided request in writing was received by official indicated in proposal by time set for opening bid proposals. When such bid proposal is reached, it will be returned to bidder unopened.

1.13 DISQUALIFICATION OF BIDDERS

A. Any of the following reasons may be considered as being sufficient for disqualification of a bidder and rejection of his/her proposal or proposals:

1. If bid is on a form other than that furnished by Owner or if form is altered or any part thereof is detached.
2. If there are unauthorized additions, conditional or substitute bids, or irregularities of any kind which may tend to make bid incomplete, indefinite or ambiguous as to its meaning.
3. If bidder adds any provisions reserving rights to accept or reject an award, or to enter into a contract pursuant to an award. This does not exclude a bid limiting 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.
4. More than one proposal for same work from an individual firm or corporation under same or different name.
5. Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any future work of Owner until any such participant shall have been reinstated as a qualified bidder.
6. Bid prices which obviously are unbalanced.

1.14 BID PROPOSAL FORM

A. Each bidder shall submit an individual Section 004113 Bid Form. Bid Form in these documents must be utilized, no alteration of form shall be made.

1.15 INSURANCE

A. Successful bidder shall provide Village of Bridgeview with appropriate insurance coverage, including automobile liability, general liability, property insurance, etc. and name Village of Bridgeview, an additional insured. Original sets of certificates shall be on file with Village of Bridgeview before work commences. Each such certificate of insurance shall provide for payment of not less than $1,000,000.00 for injury or death of one person and $2,000,000.00 for any one accident, and $500,000.00 for property damage for any one accident, and a total aggregate property damage limit of $1,000,000.00. Successful bidder shall also agree to protect Village of Bridgeview against all claims, demands, expenses, suits, or judgments arising because of, or resulting from operations of contractors, his/her agents, or his/her employees during execution of contract.

B. Successful bidder shall present evidence of insurance coverage by presenting the following prior to signing of a contract:

1. Authenticated copies of all insurance coverage.
2. Authorization by the State of Illinois to do business in State of Illinois, if insurance company is not a corporation of the State of Illinois.
3. Workmen's Compensation Certificate of State of Illinois.

C. Insurance certificate shall be submitted with coverage as follows:

1. Claim under Workers' or Workmen's Compensation, disability benefit of other similar employee benefit acts;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
3. Claims for damages because of bodily injury, sickness of disease, or death of any person other than his/her employees;
4. Claims for damages insured by usual personal injury liability coverage which are sustained by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or any other person;
5. Claims for damages, other than to work itself, because of injury to or destruction of tangible property, including loss of use resulting therefore; and claims for damages because of bodily injury or death of any person, or property damage arising out of ownership, maintenance, or use of any motor vehicle.

D. Contractor shall provide Certificate of Insurance Coverage with coverage as noted in General Requirements.

1.16 OUT OF STATE BIDDERS

A. If the successful bidder is a corporation not incorporated under the laws of the State of Illinois, a certificate from the Secretary of State of Illinois, showing the right of said bidder to do business in State of Illinois, shall be furnished.

B. If the successful bidder is a partnership or individual, not a resident of State of Illinois, he shall furnish a Power of Attorney appointing the Secretary of the State of Illinois his/her agent for purpose of receiving service of summons.

1.17 EXPERIENCE OF CONTRACTOR

A. In addition to requirements listed elsewhere, any contractor submitting a bid must have been in the business of installing roofing systems as specified a minimum of five (5) years. Bidders shall submit with their bid letter stating experience in application of systems like specified herein, or briefly stating their experiences with systems similar to one specified.

1.18 STATUTORY REQUIREMENTS

A. Bidders shall comply with the provisions of the Employment of Illinois Workers on Public Works Act, 30 ILCS 570/0.01, et seq., the Drug Free Workplace Act, 30 ILCS 580/1, et seq., the Illinois Human Rights Act, 775 ILCS 5/1-101, et seq. the Public Construction Bond Act, 30 ILCS 550/1, et seq., and the Prevailing Wage Act, 820 ILCS 130/0.01, et seq., but nothing herein shall require the application of those Acts unless required by state law. This contract calls for the construction of a "public work," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130/.01 et seq. (the "Act"). The Act requires contractors and subcontractors to pay laborers, workers and mechanics performing services on public works projects no less than the "prevailing rate of wages" (hourly cash wages plus fringe benefits) in the county where the work is performed. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website at: http://www.state.il.us/agency/idol/rates/rates.HTM. All contractors and subcontractors rendering services under this contract must comply with all requirements of the Act, including but not limited to, all wage, notice and record keeping duties. For the entire duration of his work under the Contract, the Contractor shall conform to the federal and the state statutes on equal opportunity and fair employment.

B. In accordance with the Public Construction Bond Act, 30 ILCS 550/1.01, et seq., Bidder/Contractor, before commencing any work on a project with a cost in excess of five thousand dollars ($5,000), shall furnish a Performance Bond and a Labor and Material Payment Bond to the Owner. The Performance Bond shall be in an amount equal to 100 percent of the full amount of the Agreement price as security for the faithful performance of the obligations of the Agreement and the Labor and Material Payment bond shall be in an amount equal to 100 percent of the full amount of the Agreement price as security for the payment of all persons performing labor and furnishing materials in connection with the Agreement. The bonds may be combined. In the event the contract amount is less than one hundred thousand dollars ($100,000), a non-diminishing irrevocable bank letter of credit may be substituted for the above-mentioned bonds, provided that such letter of credit is acceptable to the Owner.

1.19 TAXES

A. The successful bidder shall be required to comply with all federal, state and local requirements with regard to any and all taxes owed and/or required. Purchases of building materials for incorporation into this project are exempt from the Illinois

Retailer's Occupation Tax and Use Tax (Sales Tax). The Bidder shall exclude such taxes from consideration in preparing its Bid.

1.20 SCHEDULING OF WORK

A. Bidders' scheduling availability will have an influence on choosing lowest and best bid.

B. Time Schedule:

Installation Start Date: March 2, 2012

Substantial Completion Date: April 2, 2012

1.21 APPLICATION FOR PAYMENT

A. Material payment will be processed upon delivery of materials to job site, issuance of invoice by Contractor and approval by Owner's Representative. All suppliers and subcontractors must be paid in full and Waiver of Lien by major suppliers and subcontractors issued prior to any subsequent payments being made to contractor.

B. Not later than the 1st Monday of the month after completion of the entire work, the Contractor shall make an application for payment to the Owner, and such application shall consist of a sworn Contractor's statement supported by waivers of lien for all labor and materials being paid and certified payroll records required by the Prevailing Wage Act. Upon verification that the amount applied for is correct, and that the Work has been completed in accordance with the Contract Documents, the Owner shall pay 90% of the amount due not later than five (5) days after the 3rd Friday of that month. Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when (1) the Agreement has been fully performed by the Contractor except for the Contractor's responsibility to satisfy requirements, if any, which necessarily survive final payment; and (2) and the Work has been accepted by the Owner. Final payment shall be made by the Owner not more than 60 days after completion and acceptance by Owner and after Owner is in receipt of warranty.

END OF SECTION 002113

SECTION 004113 - BID PROPOSAL FORM

TO: Village of Bridgeview
7500 South Oketo Avenue
Bridgeview, Illinois, 60455

FOR: Roofing of Areas East Section for Municipal Building Roof Replacement

From: Name

Address

City State Zip

The undersigned hereby proposes to furnish labor and materials necessary for re-roofing in full compliance with these contract documents. The undersigned, as bidder, declares; that the parties in this contract proposal as principals are named herein; that this proposal is made without collusion with any other person, firm or corporation; that no officer or agent of the Owner is directly or indirectly interested in this proposal; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, the contract drawings, the specifications and other Contract Documents therein referred to; and he proposes and agrees that if the proposal is accepted, he will contract with the Owner in the form of the Contract attached hereby to construct completely, in the manner and time prescribed, the items bid upon, including all work incidental to such items as well as those in all addenda issued prior to the date of opening of proposals, according to the contract drawings and specifications, and that he will accept in full payment therefore the following sum:

Proposed System, manufacturer and description:

Complete tear off of existing roof system. Mechanically fasten a minimum of 3.3” of isocyanurate insulation. Adhere ½” fiber coverboard with Type III hot asphalt adhesive. Apply tapered insulation and saddles to maintain 1/8” slope to drain. Gradually taper insulation to drains starting 4’ from drain. Install field with polyester base sheet in type III hot asphalt. Install torch down smooth surface modified bitumen. Cap with granular surface modified bitumen. Flashings to receive 2 plies of polyester backer sheet in type III hot asphalt followed by torch down granular surface APP modified bitumen. Install new 24 ga. Kynar fascia, termination bars, and 24 ga. Galvanized counterflashing. Termination bar to receive a coat of SR Wite Brite Flashing (or equal) prior to installation of counterflashing. New pitch pans with SR Pitch Poxy (or equal). New drain and stack leads, All new drain bowl clamping ring hardware. Eliminate the existing 20’ x 10’ curb and make flush to metal deck. System to include Twenty (20) year warranty with service visit in first two years. Roof system to meet third party system performance requirements, FM ASTM E 108 Class A Fire Rating, FM 1-60 wind uplift rating, and Hail Rating Class 1-SH (severe hail).

The following information is essential for bid evaluation. Failure to attach any of the requested information will invalidate this proposal and bid will be considered as non-responsive.

Required bonds attached? ☐ Yes ☐ No
Manufacturer’s Specimen Warranty that meets specifications attached? ☐ Yes ☐ No

Copy of contractors License Agreement with Manufacturer attached?	☐ Yes ☐ No
Statement of ALL Asbestos Litigation during the past five (5) years against Manufacturer pertaining to roofing systems attached?	☐ Yes ☐ No

Note: Bids shall be both written in words and show in figures.

Roof Area
East Section $

Words Figures

.
Wood nailers-replacement or addition ..... …. $_____ per linear foot.
Install wood blocking at curbs, 10" nominal height ..... $_____ per linear foot.
Spot metal deck rehab .....$_____/ per square foot.
Spot wood deck replacement.....$_____/ per square foot.
Spot metal deck replacement .....$_____/ per square foot.

Should Bidder propose an alternate system to the Base Bid which is not requested by Owner, state the amount of an addition or deduct below and attach all pertinent information to the Bid Package.

All of the following must be attached or Voluntary Alternate System will not be Considered.

Manufacturer's authorized specification attached?	☐ Yes ☐ No
Manufacturer's approved shop and detail drawings attached?	☐ Yes ☐ No
Manufacturer's Specimen Warranty that meets specifications attached?	☐ Yes ☐ No
Proposed system independent laboratory test data attached?	☐ Yes ☐ No
Copy of Contractors License Agreement with Manufacturer attached?	☐ Yes ☐ No
Statement of ALL Asbestos Litigator during the past five (5) years against manufacturer pertaining to roof systems attached?	☐Yes ☐ No

This is an ☐ ADDITION ☐ DEDUCTION to base bid.

$

Words Figures

Brief description of Voluntary Alternate.

Contractor Owner / Officer (print name): _____
Signature: _____
Title: _____
Address: _____
City, State, Zip: _____
Phone: _____
Fax: _____

(AFFIX CORPORATE SEAL)

The bidder hereby acknowledges receipt of the following addenda:

Addendum No: _____ DATE: _____
Addendum No: _____ DATE: _____
Addendum No: _____ DATE: _____

END OF SECTION 004113

SECTION 011100 – SUMMARY OF WORK

PART 2 - GENERAL

2.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

2.2 SUMMARY

A. Furnish and install roof materials, insulation, flashings, and miscellaneous materials on the following designated roof areas:

B. Work on East section Includes:

1. Tear off designated roofing, insulation, flashings, perimeter metal, and obsolete equipment and properly dispose.
2. Bring to the attention of the building owner of all questionable substrate conditions and repair or replace decking as designated by building owner's representative at a cost in addition to the contracted amount based upon line item quoting on Bid Form.
3. Eliminate obsolete skylight wood frame, elevated roof area, by installing new metal decking flush to existing metal deck.
4. Install first layer of insulation, as specified.
5. Install second layer of insulation, as specified.
6. Install coverboard as specified.
7. Install tapered edge and saddles as required to keep water from standing at raised perimeter, upslope from curbs, and between drains.
8. Install stripping plies as specified around all penetrations, at curbs, and at roof area perimeters.
9. Install lead drain sumps as specified.
10. Install new drain bowl lead and hardware.
11. Install ply sheets and cap sheet as specified.
12. Install flashings as specified.
13. Install drip edge, reglet, counter flashing, lead stack flashings, and other metal components as specified.
14. Coat termination bar after fastening
15. Install new expansion joint.
16. Provide manufacturer's warranty as specified.

2.3 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.

2.4 PROTECTION

A. The Contractor shall use every available precaution to provide for the safety of property owner, visitors to the site, and all connected with the work under the specification.

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. Barricades shall be erected to fence off all construction areas from operations personnel.

D. Safety Requirements

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and owner fire and safety requirements.
3. Advise owner whenever work is expected to be hazardous to owner employees and/or operations.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
5. Maintain proper fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.
6. All safety requirements of the building owner must be followed. No exceptions will be permitted. Safety orientation meeting required prior to performing any work

2.5 HOUSEKEEPING

A. Keep materials neat and orderly.

B. Remove scrap, waste and debris from project area.

C. Maintenance of clean conditions while work is in progress and cleanup when work is completed shall be in strict accordance with the "General Requirements" of this contract.

END OF SECTION 011100

SECTION 011419 – USE OF SITE

PART 3 - GENERAL

3.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

3.2 DESCRIPTION

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

3.3 QUALITY ASSURANCE

A. Promptly upon award of Contract, notify all pertinent personnel regarding requirements of this Section.

B. Owner may require all personnel who will enter upon Owner's property certify their awareness of and familiarity with requirements of this Section.

3.4 TRANSPORTATION FACILITIES

A. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach job site. If any damage occurs contractor is responsible for repairs

B. 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 Access Route 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 area approved by Owner as "Contractor's Parking Area."

3.5 LANDSCAPING

A. Provide adequate protection for trees, grass, shrubs and all other landscaping during set-up or construction. If any damage occurs contractor is responsible for repairs as designated by Owner

B. Restrooms and other amenities of building will only be used with permission of Owner. If such authorization is given, Contractor is responsible for maintaining cleanliness and repairs as designated by Owner.

SECTION 012663 – CHANGE ORDERS

PART 4 - GENERAL

4.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

4.2 DESCRIPTION

A. Work included:

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

4.3 QUALITY ASSURANCE

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

4.4 SUBMITTALS

A. Make submittals directly to Designated Owner’s representative at his normal place of business.

B. Submit number of copies called for under various items listed in this Section.

4.5 PROCESSING CHANGES INITIATED BY THE OWNER

A. Should Owner contemplate making a change in Work or a change in Contract Time of Completion, Designated Owner’s representative will issue a "Bulletin" to Contractor.

1. Bulletins will be dated and will be numbered in sequence.
2. The Bulletin will describe contemplated change, and will carry one of following instructions to Contractor:

a. Make described change in Work at no change in Contract Sum and no change in Contract Time of Completion.

b. Promptly advise Designated Owner's representative as to credit or cost proposed for described change. This is not an authorization to proceed with change.

B. If Contractor has been directed by Designated Owner's representative to promptly advise him as to credit or cost proposed for described change, Contractor shall:

1. Analyze described change and its impact on costs and time.
2. Secure required information and forward it to Designated Owner's representative for review.
3. Meet with Designated Owner's representative as required to explain costs and, when appropriate, determine other acceptable ways to achieve desired objective.
4. Alert pertinent personnel and subcontractors as to impending change and, to maximum extent possible, avoid such work as would increase Owner's cost for making change, advising Designated Owner's representative in writing when such avoidance no longer is practicable.

4.6 PROCESSING CHANGES INTIATED BY THE CONTRACTOR

A. Should Contractor discover a discrepancy among Contract Documents or other cause for suggesting a change in Work, a change in Contract Sum, or a change in Contract Time of Completion, he shall notify Designated Owner's representative as required by pertinent provisions of Contract Documents.

B. Upon agreement by Designated Owner's representative that there is reasonable cause to consider Contractor's proposed change, Designated Owner's representative will issue a Bulletin in accordance with provisions described in Article 1.6 above.

4.7 PROCESSING BULLETINS

A. Make written reply to Designated Owner's representative in response to each Bulletin.

1. State proposed change in Contract Sum, if any.
2. State proposed change in Contract Time of Completion, if any.
3. Clearly describe other changes in Work required by 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 change has been agreed upon by Owner and Contractor Designated Owner's representative will issue a "Change Order" to Contractor.

4.8 PROCESSING CHANGE ORDERS

A. Change Orders will be dated and will be numbered in sequence.

B. Change Order will describe change or changes will refer to Bulletin or Bulletins involved, and will be signed by Owner and Designated Owner’s representative.

C. Designated Owner’s representative will issue three copies of each Change Order to Contractor.

1. The Contractor promptly shall sign all three copies and return two copies to 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 Owner.

D. Should Contractor disagree with stipulated change in Contract Sum or change in Contract Time of Completion, or both:

1. Contractor promptly shall return two copies of Change Order, unsigned by him, to Designated Owner’s representative with a letter signed by Contractor and stating reason or reasons for Contractor's disagreement.
2. Contractor's disagreement with Change Order shall not in any way relieve Contractor of his responsibility to proceed with change as ordered and to seek settlement of dispute under pertinent provisions of Contract Documents.

END OF SECTION 012663

SECTION 012900 – PAYMENT PROCEDURES

PART 5 - GENERAL

5.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

5.2 DESCRIPTION

A. Work included:

1. Comply with procedures described in this Section when applying for progress payment and final payment under Contract.

5.3 QUALITY ASSURANCE

A. Prior to start of construction, secure Designated Owner’s representative’s approval of schedule of values required to be submitted.

B. During progress of Work, modify schedule of values as approved by Designated Owner’s representative to reflect changes in Contract Sum due to Change Orders or other modifications of Contract.

C. Base requests for payment on approved schedule of values.

5.4 SUBMITTALS

A. Formal submittal: Unless otherwise directed by Designated Owner’s representative:

1. Make an informal submittal of request for payment by filling in, with erasable pencil, pertinent portions of AIA Document G702, "Application and Certificate for Payment," plus continuation sheet or sheets.
2. Sign and notarize Application and Certificate for Payment.
3. Submit original and three (3) copies of Application and Certificate for payment, plus four identical copies of continuation sheet or sheets, to Designated Owner’s representative.
4. Designated Owner’s representative will compare formal submittal with approved informal submittal and, when approved, will sign Application and Certificate for Payment, will make required copies, and will distribute:

    a. One copy to Contractor.
    b. Two copies to Owner.
    c. One copy to Designated Owner’s representative's file.

5.5 MATERIAL PAYMENT PROCEDURE

A. Material payment will be processed upon delivery of materials to job site, issuance of invoice by Contractor and approval by Owner's Representative. All suppliers and subcontractors must be paid in full and Waiver of Lien by major suppliers and subcontractors issued prior to any subsequent payments being made to contractor.

B. In absence of a letter of credit, performance, payment or materials and labor bond a waiver of lien agreement conditioned upon payment by joint check shall be performed by contractor, owner and materials manufacture for this project.

C. Once all work has been completed, and final inspection has been made, Contractor may invoice Owner for 90% of remaining labor and materials which were provided by Contractor. The owner will make payment of remaining 10% once warranty has been issued.

END OF SECTION 012900

SECTION 013219 – SUBMITTALS SCHEDULE

PART 6 - GENERAL

6.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

6.2 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 submittal for it conforms in all respects with specified requirements.
3. By affixing Contractor's signature or approval stamp to each submittal, he/she certifies that this coordination has been performed.

B. Substitutions:

1. The Contract is based on standards of quality established in Contract Documents. To give all bidders equal opportunity, use of any materials or methods other than those specified will require proper submittal information and must be pre-approved in written addenda 10 days prior to bid due date.
2. Products requiring no further approval:

   a. Minor products specified by reference to standard specification such as ASTM and similar standards.
   b. Products specified by manufacturer's name and catalog model number.

3. Building owner reserves right to final authority on acceptance or rejection of any substitute.
4. Request for substitutions will be accepted from prime bidders only. Requests for substitutions from parties not bidding on project as a primary contractor will not be considered.

C. "Or equal":

1. Specified materials are named to denote kind and quality required, whether or not words "or approved equal" are used. These materials shall serve as standards and all proposals shall be based upon same.
2. Where phrase "or equal," or "or equal as approved by Owner," occurs in Contract Documents, The material or method must be so approved for this Work by Owner prior to receipt of bids.
3. Owner’s decision is final.

D. "Basis of Design":

1. Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this specification. Comply with all manufacturer and contractor/ fabricator quality and performance criteria specified within this document.

6.3 SUBMITTAL DOCUMENTS

A. A list of three (3) jobs of similar size where proposed materials have been used, under similar conditions as specified.

B. Shop Drawings:

1. Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of item and its method of connection to Work.
2. Owner will review and comment on required changes. The Contractor may make and distribute corrected copies as are required for his purposes.

C. Copy of roofing supplier’s warranty which meets all requirements of specified warranty.

D. Material supplier providing roofing warranty shall have an ISO 9001 certification.

E. Letter from material supplier signed by a corporate officer, on company stationery, confirming that all bidding documents have been approved, that site has been inspected and meets requirements for suitability, and that specified warranty shall be provided upon satisfactory completion of project.

F. Verify material supplier is a financially stable organization with ability to protect building Owner from both product liability and warranty claims relating to roofing that might arise during course of warranty period. It is intent of building Owner to establish requirements that will protect him, be fair to all suppliers and ensure that requirements are in line with exposure of supplier. The following information will be provided by material supplier that will issue warranty and will be submitted by prime bidder:

1. A certificate of insurance for product liability with minimum limits in accordance with following formula:

a. Product Liability Insurance will be a minimum aggregate coverage, not less than 25% of total company sales, with coverage of not less than 25 million dollars per occurrence.
b. First dollar coverage (no self-insured retention or deductibles).
c. Coverage provided by an admitted company licensed to do business in Illinois, with an A.B. Best rating of A, or better.
d. An affidavit signed by a corporate officer stating that they are not currently, nor have been within last five (5) years, involved in litigation regarding asbestos content of their materials. Or provide a list of all pending asbestos related litigation, an estimate of dollar amount of all potential asbestos related liability and a summary of all asbestos related settlements over last five years.

e. An affidavit signed by a corporate officer that cost of warranty claims has not exceeded 1% of that company's total roofing product sales in any of last five (5) years.
f. If material supplier has a parent company, a letter signed by a corporate officer of parent company stating that parent company will sign or issue warranty.

G. Any proposed substitute materials or methods must also be accompanied by following documentation:

1. A detailed analysis of roofs being bid on.
2. A complete specification of proposed substitute. If, after review, substitute is found to be acceptable, copies will be provided to each bidder who has picked up original specification.
3. Written explanation of why substitutions should be considered is required.

6.4 BID DOCUMENTS

A. Bid and Proposal Form shall contain quotes to be identified "BASE BID" for specified materials and methods. Quotes for approved substitutions or specified alternates shall be identified as 'DEDUCTION FROM BASE BID" for installation.

B. Each bid shall be accompanied by a bid guarantee of 10% of bid amount. The bid guarantee may be in form of a bond or a certified check, cashier's check, or letter of credit.

C. Certificate of insurance with limits specified in Section 002113.

D. Evidence of experience as specified in Section 002113.

END OF SECTION 013219

SECTION 014110 – REGULATORY REQUIREMENTS

PART 7 - GENERAL

7.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

7.2 TAXES

A. Contractor shall pay all sales, consumer, use and other similar taxes required by law.

7.3 PERMITS AND FEES

A. Contractor shall apply for and secure all incidental permits, governmental fees and licenses necessary for proper execution and completion of the Work.

7.4 GOVERNING CODES- PREVAILING WAGE ACT

A. Work performed under this specification shall be in compliance with applicable codes, laws, and ordinances of 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 drawings

B. All work under this contract shall comply with the Prevailing Wage Rate of the State of Illinois, Illinois Compiled Statutes, 1987, Chapter 820, par. 130/31. et. seq, and as amended by Public Acts 86-799 and 86-692 and our current city ordinances, with rates to be paid in effect at time work is performed.

7.5 NOTICES

A. Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on performance of 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.

7.6 REGULATORY REQUIRMENTS

A. State and local building codes.

END OF SECTION 014110

SECTION 014200 – REFERENCES

PART 8 - GENERAL

8.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

8.2 REFERENCE STANDARDS

A. Referenced specifications and standards published by national societies, associations, and institutes shall be considered as part of this specification. In all cases, referenced specification or standard shall be most recent publication date. Abbreviated identifications for particular organizations involved are as listed below:

1. AIA - The American Institute of Architects
2. ANSI – American National Standards Institute
3. ASCE - American Society of Civil Engineers
4. ASHRAE - The American Society of Heating, Refrigerating and Air-Conditioning Engineers
5. ASTM - American Society for Testing and Materials
6. AWPA - American Wood Preservers Association
7. AWPB - American Wood Preservers Bureau
8. FM - Factory Mutual Global
9. NRCA - National Roofing Contractors Association
10. OSHA - Occupational Safety and Health Administration
11. SMACNA - Sheet Metal and Air-conditioning Contractors National Association
12. UL - Underwriters Laboratory
13. WH - Warnock-Hersey.

END OF SECTION 014200

SECTION 014500 – QUALITY CONTROL

PART 9 - GENERAL

9.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

9.2 QUALTIY CONTROL

A. Contractor shall:

1. Be experienced in hot multi-ply roofing and modified bitumen roofing.
2. Be acceptable by owner and roofing material Manufacturer/supplier.

B. Roofing manufacturer shall:

1. Be an Associate Member in good standing with National Roofing Contractors Association (NRCA).
2. Be recognized in roofing, waterproofing and moisture survey industry.
3. Be approved by owner.
4. Material manufacturer/supplier must supply representative to perform periodic inspections throughout course of project. Written reports must be submitted to owner's representative and copies to contractor.
5. Material supplier providing roofing warranty shall have an ISO 9001 certification.

C. Any deficiencies noted during inspections must be corrected by contractor and approved in writing by material manufacturer/supplier's representative.

PART 10 - PRODUCTS

10.1 GENERAL

A. Comply with Quality Control, References, Specification, and Manufacturer's data. Where conflict may exist, more stringent requirements govern.

B. Provide primary products, including each type of roofing sheet (felt), bitumen, base flashings, miscellaneous flashing materials, and sheet metal components from a single manufacturer, which has produced that type of product successfully for not less than three (3) years. Provide secondary products (insulation, mechanical fasteners, lumber, etc.) only as recommended by manufacturer of primary products for use with roofing system specified.

PART 11 - EXECUTION

11.1 SUBMITTALS

A. Provide building owner's representative a letter from roof material manufacturer indicating that applicator is approved to install their products and will provide warranty for this installation.

END OF SECTION 014500

SECTION 014516 – FIELD QUALITY CONTROL PROCEDURES

PART 12 - GENERAL

12.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

12.2 DESCRIPTION

A. Work included:

1. Provide roofing inspection services as specified herein and as needed for a complete and proper installation.

12.3 SUBMITTALS

A. Secure designated Owner’s representative's advance approval of date and time for roof substrata inspection and pre-roofing meeting.

1. Notify roofing inspection service, roofing contractor, and other interested parties, and secure their agreement to attend.
2. At least three calendar days prior to preconstruction meeting, notify designated Owner’s representative of names of persons expected to attend.

B. Records:

1. Maintain a complete and legible file, in chronological order, containing a copy of each report, certificate, and other communication received relative to work of this Section.
2. Upon completion of work of this Section, deliver a copy of complete file to designated Owner’s representative

PART 13 - PRODUCTS

13.1 ROOFING INSPECTION SERVICES

A. For work of this Section, retain roofing inspection services of company approved in advance by designated Owner’s representative.

PART 14 - EXECUTION

14.1 PRE-ROOFING MEETING

A. Not less than three nor more than ten calendar days prior to scheduled start of roofing installation, conduct a roofing substrata inspection and pre-roofing meeting at job site.

1. Designated Owner’s representative will be chairperson of meeting, will take minutes of meeting, and will record all agreements reached as a result of inspection and meeting.
2. Visually inspect all substrata upon which roofing is scheduled to be applied.
3. Determine general acceptability, and determine areas requiring further preparation.
4. Determine acceptable remedies for unacceptable areas.
5. Discuss proposed schedule for installation of roofing, and reach agreement as to dates of start and finish of installation of roofing.
6. Discuss proposed methods for installation of roofing, and equipment and personnel to be used.
7. Discuss inspection methods to be used, reports to be issued by roofing inspector, responsibilities and limits of responsibilities of roofing inspector, and potential problems arising from use of methods not agreed to in pre-roofing meeting.

14.2 INSPECTION DURING ROOFING INSTALLATION

A. Verify that materials delivered to job site are those approved by designated Owner’s representative for use on this Work.

B. Visually observe installation of roofing including, but not necessarily limited to:

1. Verify use of installation procedures agreed upon in pre-roofing meeting.
2. Call attention of contractor's representative on job to unacceptable methods and unacceptable results.
3. Report to Contractor and to designated Owner’s representative if contractor fails to correct unacceptable methods or unacceptable results.

C. Make Final visual inspection of entire roofing installation.

1. Compile a list of items required to be revised or replaced.
2. Deliver a copy of list to contractor's representative on job and to others as appropriate.
3. Verify proper revision or replacement of all items on list.

14.3 LIMITS OF ROOFING INSPECTOR’S RESPONSIBLITIES

A. During progress of roofing installation, roofing inspector is required to:

1. Make visual observations and compile reports described in this Section;

2. Advise roofing contractor's representative on job as to unacceptable methods and unacceptable results when so observed by roofing inspector.

B. In connection with roofing installation, "unacceptable methods and unacceptable results" mean methods and results other than:

1. Those recommended by manufacturer of approved roofing system materials.
2. Those required by pertinent regulations of governmental agencies having jurisdiction;
3. Those required by these Specifications; and
4. Those agreed upon in pre-roofing meeting.

C. The roofing inspector is not empowered to:

1. Act for, or in lieu of, representatives of governmental agencies having jurisdiction;
2. Give directions to Contractor or workmen on job;
3. Revise any part of Contract Documents; or
4. Approve any change in methods agreed upon in pre-roofing meeting.

D. Failure of roofing inspector to observe unacceptable methods or unacceptable results during progress of Work will not absolve Contractor from his responsibility to complete Work in accordance with specified requirements and agreed methods

END OF SECTION 014516

SECTION 016600 – PRODUCT STORAGE AND HANDLING

PART 15 - GENERAL

15.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

15.2 DESCRIPTION

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 bitumen and ply sheets in dry area protected from water or extreme humidity.
2. Store coatings and adhesives in an area where the minimum temperature is 60ºF. Protect from freezing.
3. Store ply sheets on ends only where possible; on sloped roofs, store flat parallel to joists. Discard rolls which have been flattened, creased, or otherwise damaged.
4. Stack insulation on pallets.
5. Remove plastic packing shrouds. Cover all stored materials with canvas tarpaulin top to bottom. Secure tarpaulin..
6. Rooftop storage: Disperse material on roof to avoid overloading the structure.

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.
   Environmental Requirements
3. Do not work in rain, snow or in presence of water

END OF SECTION 016600

SECTION 017700 – CLOSE OUT PROCEDURES

PART 16 - GENERAL

16.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

16.2 DESCRIPTION

A. Work Included:

1. Provide an orderly and efficient transfer of completed Work to Owner.

16.3 QUALITY ASSURANCE

A. Prior to requesting inspection by Project Manager, use adequate means to assure Work is completed in accordance with specified requirements and is ready for requested inspection.

16.4 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, designated Owner's representative will inspect to determine status of completion.
3. If the designated Owner's representative determines Work is not substantially completed:

    a. Designated Owner's representative will promptly notify Contractor, giving reasons therefore.
    b. Roofing Contractor will remedy deficiencies and notify Designated Owner's representative when ready for re-inspection.
    c. Designated Owner's representative will re-inspect 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 Contract Documents;
c. Work has been completed in accordance with Contract Documents;
d. Equipment and systems have been tested as required, and are operational;
e. Work is completed and ready for final inspection.

3. Designated Owner's representative will make an inspection to verify status of completion. If the Designated Owner's representative determines that Work is incomplete or defective:

   a. Designated Owner's representative will promptly notify Contractor, in writing, listing incomplete or defective work.
   b. Remedy deficiencies promptly, and notify Designated Owner's representative when ready for re-inspection.

4. When Designated Owner's representative determines that Work is acceptable under Contract Documents, he will request Contractor to make close-out submittals.

C. Close-out submittals include, but are not necessarily limited to:

1. Project Record Documents described in Section 013219 SUBMITTALS SCHEDULE, 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 Project Manager;
3. Warranties and bonds;
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 Project Manager, showing all adjustments to Contract Sum.
2. If so required, Designated Owner's representative will prepare final Change Order showing adjustments to Contract Sum which were not made previously by Change Orders.

16.5 INSTRUCTION

A. Instruct Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of Work.

END OF SECTION 017700

SECTION 017836 – WARRANTIES

PART 17 - GENERAL

17.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

17.2 GENERAL

A. This specification section sets forth warranty requirements.

17.3 WARRANTY

A. Quotations will include a price for a Twenty (20) year no dollar limit, non prorated warranty to be provided by the material supplier. If the supplier is a subsidiary company, the warranty must be issued by the parent company.

B. The material supplier will issue the warranty to owner upon material supplier acceptance of project completion and full payment of all bills related to project.

C. Warranty supplier shall, as part of the warranty, provide one (1) maintenance visit within the first two (2) years of the warranty period. Each maintenance visit will include Inspections, Housekeeping, Routine Maintenance and Preventive Maintenance as described below.

1. General

    a. All repairs will follow the manufacturer's written repair and maintenance guidelines or NRCA recommended repair procedure.

2. Debris

    a. A complete walkover of the existing roof areas to determine the immediate surface conditions of the roof.
    b. Removal of all naturally occurring debris (i.e., leaves, branches, paper and similar items) from the roof membrane.
    c. Service will include removal of surface debris from the roof drains, but not clogged piped or plumbing.
    d. All debris will be disposed of at the owner's approved site location.

3. Terminations and Flashing

    a. Sealant voids in termination bars, counter flashings and parapet caps will be cleaned and resealed as required.

b. Exposed fasteners will be resealed on perimeter metal details where required.
c. All pitch pans will be refilled and topped off as required.
d. Metal projections (hoods and clamps) will be checked and resealed.
e. Soil stack leads will be inspected for cuts or holed and temporarily resealed when required with appropriate materials until arrangements can be made for permanent repair.
f. Re-secure loose metal coping caps, termination bars, counter flashings and metal edge systems where required with appropriate fasteners.

4. Membrane

a. Tears, splits and breaks in the perimeter and internal membrane flashing systems and flashing strip-ins will be repaired with appropriate repair materials.
b. Visible membrane defects which may allow water into the roofing system will be repaired with appropriate repair materials.
c. Dress-up reflective coatings where mastic repairs have been made.
d. Drains
e. Check and re-secure drain bolts and clamping rings.
f. Check strip-in around drain leads, coat with approved mastics if required.

END OF SECTION 017836

SECTION 050130 – MAINTENANCE OF METAL DECKING

PART 18 - GENERAL

18.1 RELATED DOCUMENTS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

18.2 GENERAL

A. Roofing contractor shall furnish and install all materials described herein unless specifically noted otherwise

18.3 SUMMARY

A. Metal deck repairs shall be done as required creating a sound substrate for new roof installation. Deck repairs may only be done with written approval by building owner's representative.

PART 19 - PRODUCTS

19.1 METAL ROOF DECK

A. Sheet steel: ASTM A1008, Grade C structural quality; with factory applied prime coat.

B. Metal roof deck: Gage, rib depth, rib configuration - match existing; three span; lapped and stitched joints.

C. Butt and finish strips: 20-gage sheet steel.

D. Acceptable manufacturers:

1. Submit proposed manufacturer’s specification for owner approval.

E. Metal roof deck fastener manufacturers:

1. Buildex Div. of ITW, Itasca, IL

F. Rust inhibitive primer.

1. SUPERIORFLEX® SEAL PRIMER

Property	Requirements	Result	Test Method
Furol Viscosity	25 to 125 Sec	25 Sec	ASTM D 88

Distillation	Not less than 35% up to 225°C	54.10%	ASTM D 402
	Not less than 65% up to 360°C	65.20%	
Penetration	20 – 50 dmm	28 dmm	ASTM D 5
Solubility	Not less than 99%	100%	ASTM D 2042
Water Content % Max	<0.5%	0.1%	ASTM D 95

PART 20 - EXECUTION

20.1 METAL ROOF DECK REPAIRS

A. Deck Reinforcement: Install sheet steel reinforcement profiled to existing decking configuration over all rusted openings 16 sq. inches or less. If two or more rusted openings existing in same deck section, replace deck.

B. Deck Reattachment:

1. Mechanically reattach loose sections of deck to steel support members twelve inches o.c.

C. Side laps:

1. Nestable side lap: Mechanically fasten 18 inches o.c.
2. Interlocking side lap: Button punch 18 inches o.c.

D. Deck Replacement:

1. Sawcut at bar joist/beam center, remove decking. Minimum length: Three spans.
2. Erect metal decking according to SDI Design Manual. If unable to lap, butt to adjacent deck. Minimum bearing on steel supports: one inch.
3. Mechanically fasten side laps 18 inches o.c.
4. Fasten deck to steel support members at ends and intermediate supports with mechanical fasten twelve inches o.c. maximum.
5. Install six inch wide sheet steel butt strip where deck ends butt. Mechanically fasten butt strips to steel deck six inches o.c.

E. Deck Protection: Apply rust inhibitive primer over surface that was cleaned of rust.

END OF SECTION 050130

SECTION 072113 – ROOF AND DECK INSULATION

PART 21 - GENERAL

21.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including and Division 01 Specification Sections, apply to this Section.

21.2 SUMMARY

A. Section Includes:

1. Roof Insulation

B. This portion of the specification describes materials and workmanship required for installation of insulation over roof decks.

C. All materials described herein shall be furnished and installed by roofing contractor unless specifically noted otherwise.

21.3 PERFORMANCE REQUIREMENTS

A. General Performance: Installed insulation materials shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide insulation materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that are consistent with requirements in FM Approvals 4470 as part of a membrane roofing system, Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: **[Class 1A-60]**.

21.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that has UL listed and FM Approvals approved for membrane roofing system consistent to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Source Limitations: Obtain components including roof insulation, fasteners, adhesive, and etc. as approved by membrane roofing manufacturer.

D. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.

1. Meet with Owner and Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

21.5 INSULATION – GENERAL

A. All insulation materials must be approved by warrantor of primary roof membrane materials. Samples should be provided to manufacturer and written approval from warrantor of primary roof membrane materials is required before ordering these materials for 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. 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 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 all plies of roofing during same work period. At end of work period, temporary edge seals shall be installed to protect roof insulation. Upon resumption of work, they must be removed. Such seals shall consist of strips of roofing felt applied and top-coated with specified adhesive.

G. Insulation surfaces shall be cleared of all debris before roofing is placed.

H. All precautions should be made to prevent bitumen dripping during and after application of insulation and roofing materials.

21.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

PART 22 - PRODUCTS

22.1 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, Grade 3, felt or glass-fiber mat facer on both major surfaces, **[one or two layers]**, minimum thickness **[3.3”].**

C. Tapered Insulation: North Section: Provide factory-tapered insulation boards fabricated to slope of **[1/8 inch per 12 inches]** unless otherwise indicated.

D. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

22.2 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Asphalt Primer: Superior Flex Seal Primer.

C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

D. Wood Nailer Strips: Comply with requirements in Section 061053 "Miscellaneous Rough Carpentry."

E. Tapered Edge Strips: ASTM C 728, perlite insulation board.

PART 23 - EXECUTION

23.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of insulation system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Prior to installing insulation, deck must be inspected and accepted by roofing contractor and roofing system warrantor.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

23.2 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. Roofing contractor shall perform all other work of preparing deck. When insulation is applied, deck shall be dry and free of dew, frost, ice, and snow.

23.3 INSULATION INSTALLATION

A. Comply with roofing system manufacturer's written instructions for installing roof insulation.

B. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.

C. All boards installed shall be 18 inches in length or width, minimum.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

H. Mechanically Fastened Insulation: Install layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation consistent with requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification. One fastener per 4’ on center (max board size 4’x4’) corner one fastener per 3 square feet.
2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.

I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6 inches in each direction from joints of insulation below. Loosely butt cover boards together and Tape joints if required by roofing system manufacturer.

1. Fasten cover boards consistent with requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
3. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
4. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

J. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

K. Roofing system will be considered defective if it does not pass tests and inspections.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

23.4 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 072113

SECTION 075213 - ATACTIC-POLYPROPYLENE (APP) MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 24 - GENERAL

24.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including and Division 01 Specification Sections, apply to this Section.

24.2 SUMMARY

A. Section Includes:

1. Atactic-polypropylene (APP) modified bituminous membrane roofing.
2. Hybrid roofing system that combines built-up ply sheets with APP-modified bituminous membrane.

B. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

C. Independent Roof System Testing: The roofing system shall comply with independent testing to comply with system performance as detailed below:

procedure	astm	Load MD	Load XMD	Elongation MD	Elongation XMD
Tensile and elongation (23 degrees C)	D2523	146.71 lbf	143.84 lbf	32.32 %	45.39%
Tensile and elongation (minus 18 deg. C)	D2523	293.18 lbf	220.09 lbf	9.15 %	3.83%

D. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

E. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4470 as part of a membrane roofing system, Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: [**Class 1A-60**]

24.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that has UL listed and FM Approvals approved for membrane roofing system consistent to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Source Limitations: Obtain components including roof insulation, fasteners, adhesive, and etc. as approved by membrane roofing manufacturer.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A Fire rating for application and roof slopes indicated, as determined by testing membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Hail Rating: Class 1-SH, severe hail

F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.

1. Meet with Owner and Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

G. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner and Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative,

deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

24.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

E. Fire extinguishers shall be provided for use around any open flames.

24.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

24.6 WARRANTY

A. Refer to Section 01 78 36 for warranty requirements.

PART 25 - PRODUCTS

25.1 APP-MODIFIED ASPHALT-SHEET MATERIALS

A. APP-Modified Bituminous Membrane Roofing:

1. Basis of Design: Subject to compliance with system requirements, provide products by the following:

a. SR Products, GAF, Firestone or equal

B. Granule-Surfaced Roofing Membrane Cap Sheet: One Ply, ASTM D 6222, Grade G, Type I, APP-modified asphalt sheet (reinforced with polyester fabric); granular surfaced; suitable for application method specified, and as follows:

1. 4 mm Granular Surface APP Modified Bitumen

Property	Typical Value	Test Method
Thickness, mil	157 mils (4.0mm)	ASTM D 6222 Type I, Grade S
Peak Load, 73.4 ± 3.6ºF lbf/in.	114 MD 85 XMD	ASTM D 6222 Type I, Grade S
Elongation at Peak Load, 73.4 ± 3.6ºF, %	47 MD 47 XMD	ASTM D 6222 Type I, Grade S
Peak Load, 0ºF ± 3.6ºF lbf/in.	135 MD 122 XMD	ASTM D 6222 Type I, Grade S
Elongation at Peak Load, 0ºF ± 3.6ºF, %	52 MD 56 XMD	ASTM D 6222 Type I, Grade S
Ultimate Elongation, 73.4 ± 3.6ºF lbf/in.	52 MD 53 XMD	ASTM D 6222 Type I, Grade S
Tear Strength, 73.4 ± 3.6ºF lbf/in.	134 MD 122 XMD	ASTM D 6222 Type I, Grade S
Low Temperature Flexibility, ºC	0º C	ASTM D 6222 Type I, Grade S
Dimensional Stability, %	<0.5%	ASTM D 6222 Type I, Grade S
Compound Stability, ºF	230 ºF	ASTM D 6222 Type I, Grade S
Granule Embedment, g, maximum	<2.0 g	ASTM D 6222, Type I, Grade S

C. Roofing Ply Membrane Sheet: **(one ply)** ASTM D 6222, Grade S, Type I, APP-modified asphalt sheet (reinforced with polyester fabric; smooth surfaced; suitable for application method specified.

1. 3.5 mm Smooth Surface APP Ply Sheet

Property	Typical Value	Test Method
Thickness, mil	140 mils (3.5mm)	ASTM D 6222 Type I, Grade S
Maximum Load, 73.4 ± 3.6ºF lbf/in.	100 MD 75 XMD	ASTM D 6222 Type I, Grade S
Elongation at Peak Load, 73.4 ± 3.6ºF, %	45 MD 45 XMD	ASTM D 6222 Type I, Grade S
Maximum Load, 0ºF ± 3.6ºF lbf/in.	120 MD 100 XMD	ASTM D 6222 Type I, Grade S
Elongation at Maximum Load, 0ºF ± 3.6ºF, %	52 MD 54 XMD	ASTM D 6222 Type I, Grade S
Ultimate Elongation, 73.4 ± 3.6ºF lbf/in.	51 MD 53 XMD	ASTM D 6222 Type I, Grade S
Tear Strength, 73.4 ± 3.6ºF lbf/in.	122 MD 116 XMD	ASTM D 6222 Type I, Grade S
Low Temperature Flexibility, ºC	0ºC	ASTM D 6222 Type I, Grade S
Dimensional Stability, %	<0.5%	ASTM D 6222 Type I, Grade S
Compound Stability, ºF	230ºF	ASTM D 6222 Type I, Grade S

25.2 BASE FLASHING SHEET MATERIALS

A. Backer Sheet – **Two Plies:** Grade S, Type I, II, or III asphalt sheet; smooth surfaced; suitable for application method specified.

1. POLYESTER BASE SHEET

Property	Typical Value	Test Method
Tear Strength @ 77°F/lbf	144.4 MD 114.6 XMD	ASTM D 5147
Tensile @ 77°F lbf/in	97.5 MD 65.8 XMD	ASTM D 146
Elongation at Break @ 77°F, %	48.82 MD 64.54 XMD	ASTM D 146
Mass of Raw Material, min (grams sq meter)	170	ASTM D 228
Surfacing & Stabilizer lbs, 100 sq. ft.	10	ASTM D 228
Asphalt Minimum, (lb/100 sq ft, w/10% limestone filler)	17	ASTM D 228
Moisture % Max at Time of Manufacture	1	ASTM D 146
Asphalt Coated Mat (finished product min; lb/100 sq ft	31	ASTM D 228
Pliability, 13 mm (1/2 in) radius	0 Failures	ASTM D 4601

B. Granule-Surfaced Flashing Sheet: One Ply, ASTM D 6222, Grade G, Type I, APP-modified asphalt sheet (reinforced with polyester fabric); granular surfaced; suitable for application method specified, and as follows:

1. 4 mm APP Granular Surfaced Modified Bitumen

Property	Typical Value	Test Method
Thickness, mil	157 mils (4.0mm)	ASTM D 6222 Type I, Grade S
Peak Load, 73.4 ± 3.6ºF lbf/in.	114 MD 85 XMD	ASTM D 6222 Type I, Grade S
Elongation at Peak Load, 73.4 ± 3.6ºF, %	47 MD 47 XMD	ASTM D 6222 Type I, Grade S
Peak Load, 0ºF ± 3.6ºF lbf/in.	135 MD 122 XMD	ASTM D 6222 Type I, Grade S
Elongation at Peak Load, 0ºF ± 3.6ºF, %	52 MD 56 XMD	ASTM D 6222 Type I, Grade S
Ultimate Elongation, 73.4 ± 3.6ºF lbf/in.	52 MD 53 XMD	ASTM D 6222 Type I, Grade S
Tear Strength, 73.4 ± 3.6ºF lbf/in.	134 MD 122 XMD	ASTM D 6222 Type I, Grade S
Low Temperature Flexibility, ºC	0º C	ASTM D 6222 Type I, Grade S
Dimensional Stability, %	<0.5%	ASTM D 6222 Type I, Grade S
Compound Stability, ºF	230 ºF	ASTM D 6222 Type I, Grade S
Granule Embedment, g, maximum	<2.0 g	ASTM D 6222, Type I, Grade S

25.3 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Asphalt Primer: Superior Flex Seal Primer.

C. Asphalt Roofing Cement: ASTM D 4586, asbestos free,

1. RMA ELASTIC

Property	Typical Value	Test Method
Percent Solids by Weight	78%	ASTM D 4586
Percent Solids by Volume	70%	ASTM D 4586
Weight per Gallon	9.6 lbs	ASTM D 4586
Flash Point (Seta C. C.)	105°F	ASTM D 4586
Viscosity @ 77°F	640,000 cPs	ASTM D 4586
Long-Term Service Temperature	-60°F to +160°F	ASTM D 4586
Water Resistance, Intermittent Exposure	Excellent	ASTM D 4586
Water Resistance, Ponded	Fair	ASTM D 4586
UV Resistance	Excellent	ASTM D 4586

2. SR FLASHING CEMENT

Property	Typical Value	Test Method/Sample

		Method
Lap Shear Adhesion	60.84 lbf	ASTM D 3019
Tensile Strength	1298.1 psi	ASTM D 412
Elongation	961.24%	ASTM D 412
Non-Volatile Matter by Weight	77.67%	ASTM D 4586
Viscosity @ 250ºF	116,000 cPs	ASTM D 2196
Specific Gravity	1.0032	ASTM D 1475
Adhesion to Concrete	11.970 lbf/in	ASTM D 903
Adhesion to Plywood	11.228 lbf/in	
Water Content % Max	2.0%	ASTM D 4586/95
Solids Content	44.6%	ASTM D 4586/2822
Bitumen Content %	47.61%	ASTM D 4586/4
Behavior @ 140ºF (pass/fail)	Pass	ASTM D 4586/2822
Pliability @ 0ºF (pass/fail)	Pass	ASTM D 4586/2822

D. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

E. Glass-Fiber Fabric: SR Glass Mesh - Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

F. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match roofing membrane.

G. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

PART 26 - EXECUTION

26.1 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 curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

26.2 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. When heat welding and using open flames, all applicable hot work rules apply, specifically proper fire watch, fire extinguishers, and fire safety precautions.

26.3 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing".

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. At end of each day's work, provide tie-offs to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

E. Membrane installation further requirements:

1. Place ply sheets to ensure water will flow over or parallel to, but never against, exposed edges.
2. Ply should never touch ply even at roof edges, laps, tapered edge strips, and cants.
3. Avoid traffic on all newly installed membrane.
4. Overlap previous day's work 24 inches.
5. Lap ply sheet ends six inches. Stagger end laps twelve inches minimum.
6. Fit plies into roof drain rims, install metal flashing and finishing plies, secure clamping collars, and install domes.
7. Cut out fishmouths/side laps that are not completely sealed. Replace all sheets that are not fully and continuously bonded.

8. Roof is to be inspected and approved by representative from roof system warrantor before application of surfacing.
9. Follow warranty supplier's recommendations for backnailing requirements.

F. Daily Waterstop/Tie-Ins

1. Install "deadman" insulation filler at insulation staggers.
2. Extend roofing plies at least twelve inches onto prepared area of adjacent roofing. Embed plies into Specified Interply Adhesive. Strip edges with twelve-inch wide ply sheet embedded completely in alternate uniform courses of Specified Interply Adhesive.
3. At beginning of next day's work, remove temporary connection by cutting felts evenly along edge of existing roof system. Remove "deadman" insulation fillers

26.4 APP-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Heat Weld to substrate.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing membrane sheets so side and end laps shed water.

26.5 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Flashing Sheet Application: Heat Weld flashing sheet to substrate.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

E. Roof Drains: Set **30-by-30-inch- (760-by-760-mm-)** square metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of **6 inches (150 mm)** beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

26.6 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

B. Roofing system will be considered defective if it does not pass tests and inspections.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

26.7 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075213

SECTION 076200 – SHEET METAL FLASHING AND TRIM

PART 27 - GENERAL

27.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

27.2 GENERAL

A. Roofing contractor shall furnish and install all materials described herein unless specifically noted otherwise

27.3 SUMMARY

A. Formed sheet metal work for flashing and insulated expansion joint covers are specified in this section.

27.4 RELATED WORK

A. Composition base flashings and stripping in metal roof flanges:

1. Section 075113 BUILT-UP ASPHALT ROOFING.
2. Section 075114 COLD PROCESS BUILT-UP ASPHALT ROOFING.
3. Section 075216 SBS MODIFIED MEMBRANE ROOFING.

B. Flashing of Roof Drains:

1. Section 221426 ROOF DRAINS.

27.5 SUBMITTALS

A. Submit in accordance with Section 013323, Shop Drawings, Product Data, and Samples.

B. Shop drawings:

1. Flashings.
2. Gravel Stop-Fascia.
3. Expansion joints.
4. Fascia-cant.
5. Manufacturer's Literature and Data.

6. Two-piece counterflashing.
7. Thru wall flashing.
8. Expansion joint cover, each type.
9. Fascia-cant.

27.6 APPLICABLE PUBLICATIONS

A. The publications listed below for a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

1. A167-99(R 2004): Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
2. A653/A653M-05: Steel Sheet Zinc-Coated (Galvanized) or Zinc Alloy Coated (Galvanized) by the Hot- Dip Process
3. B32-04: Solder Metal
4. B209-04: Aluminum and Aluminum-Alloy Sheet and Plate
5. B370-03: Copper Sheet and Strip for Building Construction
6. D173-03: Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing
7. D412-98 (R2002): Vulcanized Rubber and Thermoplastic Elastomers-Tension
8. D1187-97 (R2002): Asphalt Base Emulsions for Use as Protective Coatings for Metal
9. D1784-03: Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
10. D3656-04: Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns
11. D4586-00: Asphalt Roof Cement, Asbestos Free

C. American National Standards Institute/Single Ply Roofing Institute (ANSI/SPRI):

1. ES-1-2003: Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual (Fifth Edition, 1993).

E. National Association of Architectural Metal Manufacturers (NAAMM):

1. AMP 500 Series: Metal Finishes Manual

F. American Architectural Manufacturers Association (AAMA):

1. 605-98: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions Panels

G. Federal Specification (Fed. Spec):

1. A-A-1925A: Shield, Expansion; (Nail Anchors)
2. UU-B-790A: Building Paper, Vegetable Fiber

H. International Building Code (IBC):

1. 2003 Edition

PART 28 - PRODUCTS

28.1 MATERIALS

A. Solder: ASTM B32; flux type and alloy composition as required for use with metals to be soldered.

B. Stainless Steel: ASTM A167, Type 302 or 304, dead soft temper.

C. Galvanized Sheet: ASTM, A653.

D. Nonreinforced, Elastomeric Sheeting: Elastomeric substances reduced to thermoplastic state and extruded into continuous homogenous sheet (0.056 inch) thick. Sheeting shall have not less than 7 MPa (1,000 psi) tensile strength and not more than seven percent tension-set at 50 percent elongation when tested in accordance with ASTM D412. Sheeting shall show no cracking or flaking when bent through 180 degrees over a 1/32 inch diameter mandrel and then bent at same point over same size mandrel in opposite direction through 360 degrees at temperature of -30°C (-20 °F).

E. Fasteners:

1. Use copper, copper alloy, bronze, brass, or stainless steel for copper and copper clad stainless steel, and stainless steel for stainless steel and aluminum alloy. Use galvanized steel or stainless steel for galvanized steel.
2. Nails:

   a. Minimum diameter for copper nails: 3 mm (0.109 inch).
   b. Minimum diameter for aluminum nails 3 mm (0.105 inch).
   c. Minimum diameter for stainless steel nails: 2 mm (0.095 inch) and annular threaded.
   d. Length to provide not less than 7/8” penetration into anchorage.

3. Rivets: Not less than 3 mm (1/8 inch) diameter.
4. Expansion Shields: Fed Spec A-A-1925A.

F. Sealant: As specified in Section SEALANTS AND CAULKING for exterior locations.

G. Insect Screening: ASTM D3656, 18 by 18 regular mesh.

H. Roof Cement: ASTM D4586.

28.2 SHEET METAL THICKNESS

A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:

B. Concealed Locations (Built into Construction):

1. Copper: 30g (10 oz) minimum 0.33 mm (0.013 inch thick).
2. Stainless steel: 0.25 mm (0.010 inch) thick.
3. Copper clad stainless steel: 0.25 mm (0.010 inch) thick.
4. Galvanized steel: 0.5 mm (0.021 inch) thick.

C. Exposed Locations:

1. Copper: 16 oz.
2. Stainless steel: 0.015 inch.
3. Copper clad stainless steel: 0.015 inch.
4. Thickness of aluminum or galvanized steel is specified with each item

28.3 FABRICATION

A. Jointing:

1. In general, copper, stainless steel and copper clad stainless steel joints, except expansion and contraction joints, shall be locked and soldered.
2. Jointing of copper over 20 oz weight or stainless steel over 0.018 inch thick shall be done by lapping, riveting and soldering.
3. Joints shall conform to following requirements:

    a. Flat-lock joints shall finish not less than 3/4 inch wide.
    b. Lap joints subject to stress shall finish not less than one inch wide and shall be soldered and riveted.
    c. Unsoldered lap joints shall finish not less than 4 inches wide.

4. Flat and lap joints shall be made in direction of flow.
5. Edges of bituminous coated copper, copper covered paper, nonreinforced elastomeric sheeting and polyethylene coated copper shall be jointed by lapping not less than 4 inches in the direction of flow and cementing with asphalt roof cement or sealant as required by the manufacturer's printed instructions.
6. Soldering:

    a. Pre tin both mating surfaces with solder for a width not less than 1 1/2 inches of uncoated copper, stainless steel, and copper clad stainless steel.
    b. Wire brush to produce a bright surface before soldering lead coated copper.
    c. Treat in accordance with metal producers recommendations other sheet metal required to be soldered.
    d. Completely remove acid and flux after soldering is completed.

B. Expansion and Contraction Joints:

1. Fabricate in accordance with the Architectural Sheet Metal Manual recommendations for expansion and contraction of sheet metal work in continuous runs.
2. Space joints as shown or as specified.

3. Space expansion and contraction joints for copper, stainless steel, and copper clad stainless steel at intervals not exceeding 24 feet
4. Space expansion and contraction joints for aluminum at intervals not exceeding 5400 mm (18 feet), except do not exceed 10 feet for gravel stops and fascia-cant systems.
5. Fabricate slip-type or loose locked joints and fill with sealant unless otherwise specified.
6. Fabricate joint covers of same thickness material as sheet metal served.

C. Cleats:

1. Fabricate cleats to secure flashings and sheet metal work over 12 inches wide and where specified.
2. Provide cleats for maximum spacing of 12 inch centers unless specified otherwise.
3. Form cleats of same metal and weights or thickness as the sheet metal being installed unless specified otherwise.
4. Fabricate cleats from 2 inch wide strip. Form end with not less than 3/4 inch wide loose lock to item for anchorage. Form other end of length to receive nails free of item to be anchored and end edge to be folded over and cover nail heads.

D. Edge Strips or Continuous Cleats:

1. Fabricate continuous edge strips where shown and specified to secure loose edges of the sheet metal work.
2. Except as otherwise specified, fabricate edge strips or minimum // 24 oz copper // 0.024 inch thick stainless steel // 0.050 inch thick aluminum. //
3. Use material compatible with sheet metal to be secured by the edge strip.
4. Fabricate in 10 feet maximum lengths with not less than ¾ inch loose lock into metal secured by edge strip.
5. Fabricate Strips for fascia anchorage to extend below the supporting wood construction to form a drip and to allow the flashing to be hooked over the lower edge at least ¾ inch.
6. Fabricate anchor edge maximum width of 3 inches or of sufficient width to provide adequate bearing area to insure a rigid installation using 32 oz copper // 0.031 inch thick stainless steel // 0.0625 inch thick aluminum.

E. Drips:

1. Form drips at lower edge of sheet metal counter-flashings (cap flashings), fascias, gravel stops, wall copings, by folding edge back 1/2 inch and bending out 45 degrees from vertical to carry water away from the wall.
2. Form drip to provide hook to engage cleat or edge strip for fastening for not less than 3/4 inch loose lock where shown.

F. Edges:

1. Edges of flashings concealed in masonry joints opposite drain side shall be turned up 1/4 inch to form dam, unless otherwise specified or shown otherwise.

2. Finish exposed edges of flashing with a ¼ inch hem formed by folding edge of flashing back on itself when not hooked to edge strip or cleat. Use ¼ inch minimum penetration beyond wall face with drip for through-wall flashing exposed edge.
3. All metal roof edges shall meet requirements of IBC 2003

G. Metal Options:

1. Where options are permitted for different metals use only one metal throughout.
2. Stainless steel may be used in concealed locations for fasteners of other metals exposed to view.
3. Where copper gravel stops, copings and flashings will carry water onto cast stone, stone, or architectural concrete, or stainless steel

28.4 FINISH

A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.

B. In accordance with NAAMM Metal Finishes Manual, unless otherwise specified.

C. Finish exposed metal surfaces as follows, unless specified otherwise:

1. Copper: Mill finish.
2. Stainless Steel: Finish No. 2B or 2D.
3. Aluminum:

   a. Clear Finish: AA-C22A41 medium matte, clear anodic coating, Class 1 Architectural, 18 mm (0.7 mils) thick.
   b. Colored Finish: AA-C22A42 (anodized) or AA-C22A44 (electrolytically deposited metallic compound) medium matte, integrally colored coating, Class 1 Architectural, 18 mm (0.7 mils) thick. Dyes will not be accepted.
   c. Fluorocarbon Finish: AAMA 605.2, high performance organic coating.
   d. Mill finish.

4. Steel and Galvanized Steel:

   a. Manufacturer's finish: Kynar.

28.5 BASE FLASHING

A. Use metal base flashing at vertical surfaces intersecting built-up roofing without cant strips or where shown.

1. Use either copper, or stainless steel, thickness specified unless specified otherwise.
2. When flashing is over 10 inches in vertical height or horizontal width use either 20 oz copper or 0.018 inch stainless steel.

3. Use stainless steel at aluminum roof curbs where flashing contacts the aluminum.
4. Use either copper, or stainless steel at pipe flashings.

B. Fabricate metal base flashing up vertical surfaces not less than 8 inch nor more than 16 inch.

C. Fabricate roof flange not less than 4 inches wide unless shown otherwise. When base flashing length exceeds 8 feet form flange edge with 1/2 inch hem to receive cleats.

D. Form base flashing bent from strip except pipe flashing. Fabricate ends for riveted soldered lap seam joints. Fabricate expansion joint ends as specified.

E. Pipe Flashing: (Other than engine exhaust or flue stack)

1. Fabricate roof flange not less than 4 inches beyond sleeve on all sides.
2. Extend sleeve up and around pipe and flange out at bottom not less than 1/2 inch and solder to flange and sleeve seam to make watertight.
3. At low pipes 8 inch to 18 inch above roof:

   a. Form top of sleeve to turn down into the pipe at least one inch.
   b. Allow for loose fit around and into the pipe.

4. At high pipes and pipes with goosenecks or other obstructions which would prevent turning the flashing down into the pipe:

   a. Extend sleeve up not less than 12 inch above roofing.
   b. Allow for loose fit around pipe

28.6 COUNTERFLASHING (CAP FLASHING OR HOODS)

A. Either copper or stainless steel, unless specified otherwise.

B. Fabricate to lap base flashing a minimum of 4 inches with drip.

1. Form lock seams for outside corners. Allow for lap joints at ends and inside corners.
2. In general, form flashing in lengths not less than 8 feet and not more than 10 feet.
3. Two-piece, lock in type flashing may be used in lieu of one piece counter-flashing.
4. Manufactured assemblies may be used.
5. Where counterflashing is installed at new work use an integral flange at the top designed to be extended into the masonry joint or reglet in concrete.
6. Where counterflashing is installed at existing work use surface applied type, formed to provide a space for the application of sealant at the top edge.

C. One-piece Counterflashing.

1. Back edge turned up and fabricate to lock into reglet in concrete.

2. Upper edge formed to extend full depth of masonry unit in mortar joint with back edge turned up 1/4 inch.
3. edge designed to snap lock into receiver.

D. Pipe Counterflashing:

1. Form flashing for water-tight umbrella with upper portion against pipe to receive a draw band and upper edge to form a "V" joint sealant receiver approximately 3/4 inch deep.
2. Fabricate 4 inch over lap at end.
3. Fabricate draw band of same metal as counter flashing. Use 24 oz copper or 0.013 inch thick stainless steel or copper coated stainless steel.
4. Use stainless steel bolt on draw band tightening assembly.
5. Vent pipe counter flashing may be fabricated to omit draw band and turn down one inch inside vent pipe.

E. Where vented edge decks intersect vertical surfaces, form in one piece, shape to slope down to a point level with and in front of edge-set notched plank; then, down vertically, overlapping base flashing.

28.7 GRAVEL STOPS

A. General:

1. Fabricate in lengths not less than 8 feet long and maximum of 10 feet.
2. Fabricate internal and external corners as one-piece with legs not less than 2 feet or more than 4 feet long.
3. Fabricate roof flange not less than 4 inches wide.
4. Fabricate top edge to extend above roof not less than one inch for embedded gravel aggregate and not less than 4 inches for loose laid ballast.
5. Fabricate lower edge outward at an angle of 45 degrees to form drip and as fascia or as counter flashing as shown.

    a. Fabricate of one-piece material of suitable width for fascia height of 10 inch maximum or counterflashing lap of not less than 4 inch over base flashing.
    b. Fabricate bottom edge of formed fascia to receive edge strip.
    c. When fascia bottom edge forms counter flashing over roofing lap roofing not less than 6 inches.

28.8 INSULATED EXPANSION JOINT COVERS

A. Either type optional, use only one type throughout.

B. Types:

1. Construct of two preformed, stainless steel strips, not less than 0.015 inch thick, mechanically and adhesively bonded to both sides of a 1/16 inch thick neoprene or butyl sheet, or to a 0.4 mm (32 mil) thick reinforced chlorinated polyethylene sheet. Adhesively attach a 3/8 inch thick sheet of closed cell, neoprene foam

insulation, to the underside of the neoprene, butyl, or chlorinated polyethylene sheet.

2. Constructed of a 1/16 inch thick vinyl sheet, flanged at both sides with stainless steel strips not less than 0.015 inch thick. Vinyl sheet locked and encased by the stainless steel strip and prepunched for nailing. A 3/8 inch thick closed cell polyvinyl chloride foam insulating strip shall be heat laminated to the underside of the vinyl sheet between the stainless steel strips.

C. Expansion joint covers shall have factory fabricated mitered corners // crossing // tees // and other necessary accessories. Furnish in the longest available lengths.

D. Metal flange of sufficient width to extend over the top of the curb and down curb sides 2 inches with hemmed edge for lock to edge strip

PART 29 - EXECUTION

29.1 INSTALLATION

A. General:

1. Install flashing and sheet metal items as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
2. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
3. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate. Cover holes or cracks in wood wider than 1/4 inch with sheet metal compatible with the roofing and flashing material used.
4. Coordinate with masonry work for the application of a skim coat of mortar to surfaces of unit masonry to receive flashing material before the application of flashing.
5. Apply a layer of 15 pound saturated felt followed by a layer of rosin paper to wood surfaces to be covered with copper. Lap each ply 2 inch with the slope and nail with large headed copper nails.
6. Confine direct nailing of sheet metal to strips 12 inch or less wide. Nail flashing along one edge only. Space nails not over 4 inches on center unless specified otherwise.
7. Install bolts, rivets, and screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Space rivets at 3 inch on centers in two rows in a staggered position. Use neoprene washers under fastener heads when fastener head is exposed.
8. Coordinate with roofing work for the installation of metal base flashings and other metal items having roof flanges for anchorage and watertight installation.
9. Nail continuous cleats on 3 inch on centers in two rows in a staggered position.
10. Nail individual cleats with two nails and bend end tab over nail heads. Lock other end of cleat into hemmed edge.

11. Install flashings in conjunction with other trades so that flashings are inserted in other materials and joined together to provide a water tight installation.
12. Where required to prevent galvanic action between dissimilar metal isolate the contact areas of dissimilar metal with sheet lead, waterproof building paper, or a coat of bituminous paint.
13. Isolate aluminum in contact with dissimilar metals others than stainless steel, white bronze or other metal compatible with aluminum by:

    a. Paint dissimilar metal with a prime coat of zinc-chromate or other suitable primer, followed by two coats of aluminum paint.
    b. Paint dissimilar metal with a coat of bituminous paint.
    c. Apply an approved caulking material between aluminum and dissimilar metal.
    d. Paint aluminum in contact with or built into mortar, concrete, plaster, or other masonry materials with a coat of bituminous paint.
    e. Paint aluminum in contact with absorptive materials that may become repeatedly wet with two coats of bituminous paint or two coats of aluminum paint.

14. Bitumen Stops:

    a. Install bitumen stops for built-up roof opening penetrations through deck and at formed sheet metal gravel stops.
    b. Nail leg of bitumen stop at 12 inch intervals to nailing strip at roof edge before roofing material is installed.

29.2 EXPANSION JOINT COVERS, INSULATED

A. Install insulated expansion joint covers at locations shown on curbs not less than 8 inch high above roof surface.

B. Install continuous edge strips of same metal as expansion joint flange, nailed at not less than 3 inch centers.

C. Install insulated expansion joint covers in accordance with manufacturer's directions locking edges to edge strips.

SECTION 221426 – ROOF DRAINS

PART 30 - GENERAL

30.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

30.2 GENERAL

A. Existing drains will be re-worked, re-flashed, and deteriorated components replaced.

B. 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.

C. All drains will require new flashing lead.

D. New drains to be installed as directed by building owner's representative.

30.3 ACTION SUBMITTALS

1. Product Data: For each type of product indicated.

PART 31 - PRODUCTS

31.1 DRAIN ACCESSORIES

A. Replacement parts should be from same manufacturer of original drain.

B. New drains should be appropriate for existing conditions. Acceptable drain manufacturer’s are:

1. Zurn, Erie, PA.
2. Smith, Montgomery, Alabama.
3. Josam, Michigan City, Indian.

C. Metal flashing:

1. ASTM B29-79(1984), four lb. sheet lead.
2. Soft copper drain flashing sheet.

D. Mastics & Adhesives:

1. As approved by roofing system manufacturer.

PART 32 - EXECUTION

32.1 DRAINS

A. Existing Drains:

1. Remove flashing collar. Clean. If broken, replace.
2. Install tapered edge strip around drain to create 48 x 48 inch sump. Miter corners. Seal top of tapered edge to drain rim with fiberglass mesh embedded between alternate courses of asphalt mastic.
3. Install multi-ply roofing or stripping plies into sump and onto drain rim.
4. Apply 1/16 inch uniformly thick layer of asphalt mastic to surface receiving lead flashing.
5. Set single piece lead flashing (30” square minimum) in mastic centered over drain, extend lead six inches beyond drain rim. Neatly dress lead with wood block.
6. Prime lead with asphalt primer.
7. Install two plies fiberglass roof ply embedded in alternate courses of hot melt adhesive over primed lead. Stripping plies shall extend two and four inches beyond edge of lead.
8. Re-clamp flashing collar to drain in bed of mastic. If bolts are broken, drill and re-tap. If ladder clamps are installed, replace clamps.
9. Neatly cut lead within drain at rim, remove.
10. Install strainer.

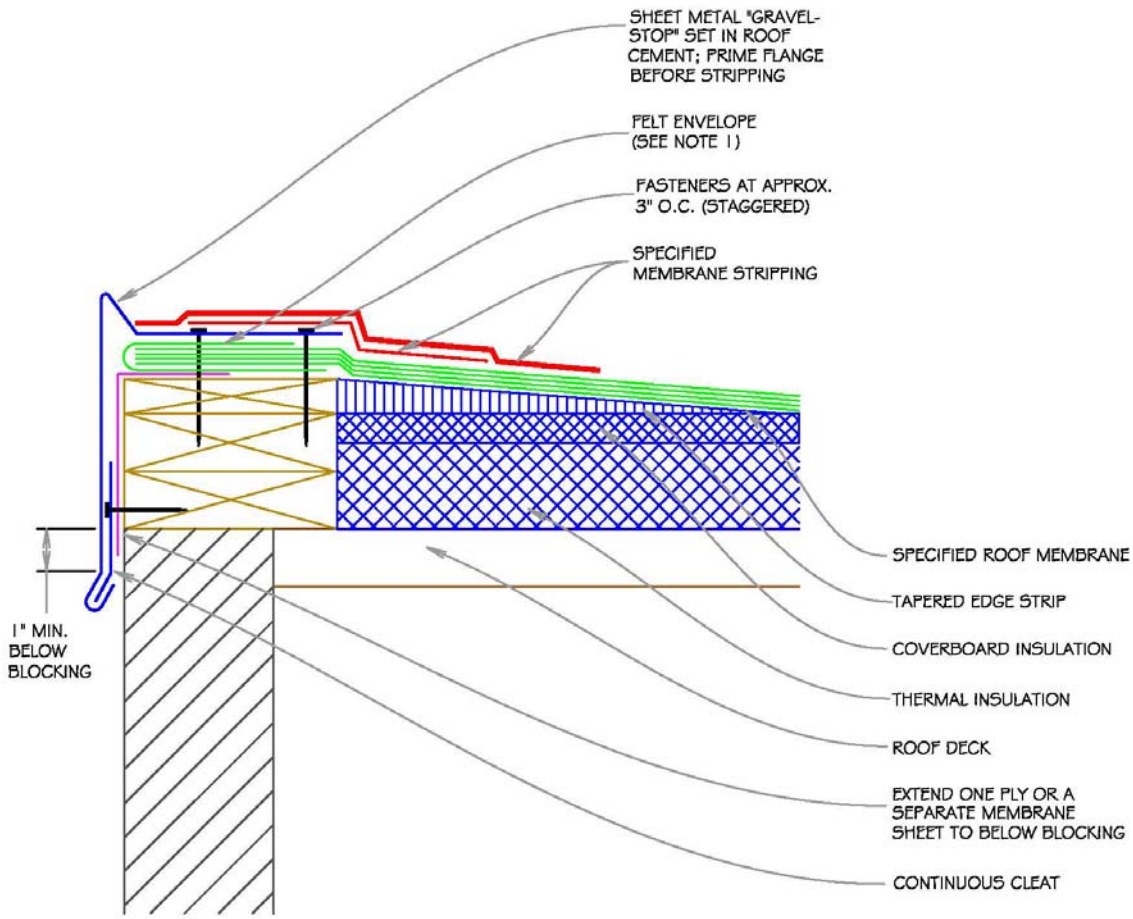
B. New Drains:

1. Locate and install drain body in locations specified by owner's representative.
2. Install tapered edge strip around drain to create 48 x 48 inch sump. Miter corners. Seal top of tapered edge to drain rim with fiberglass mesh embedded between alternate courses of asphalt mastic.
3. Install multi-ply roofing or stripping plies into sump and onto drain rim.
4. Apply 1/16 inch uniformly thick layer of asphalt mastic to surface receiving lead flashing.
5. Set single piece lead flashing (30” square minimum) in mastic centered over drain, extend lead six inches beyond drain rim. Neatly dress lead with wood block.
6. Prime lead with asphalt primer.
7. Install two plies fiberglass roof ply embedded in alternate courses of hot melt adhesive over primed lead. Stripping plies shall extend two and four inches beyond edge of lead.
8. Re-clamp flashing collar to drain in bed of mastic. If bolts are broken, drill and re-tap. If ladder clamps are installed, replace clamps.
9. Neatly cut lead within drain at rim, remove.
10. Seal/plug drain to prevent water entry until service connection is completed.

C. Service Connection:

1. Locate new piping to include as few bends as possible. Do not overload any existing pipe and drain, ensure balanced disposal of all rain water. Make adequate provisions for thermal movement of all piping. Location should not be adjacent to structural columns.
2. Provide cleanouts at elbows under each drain, and at tops and bottoms of each vertical run, at connection to storm sewer, as called for by Plumbing Code, and as required to make sure that drainage system can be cleaned anywhere, if needed. Provide and install access panels if required for service cleanouts.
3. Where new work joins old, provide all necessary materials, repairs, changes, and associated work as needed for proper connections.
4. Make all connections watertight.
5. Remove seal/plug and install strainer.
6. Use insulation on all pipes and fittings from drains to existing down- pipes. Ensure full continuity of insulation over pipes, fitting, and connections. Provide concealed saddles at all hangers.

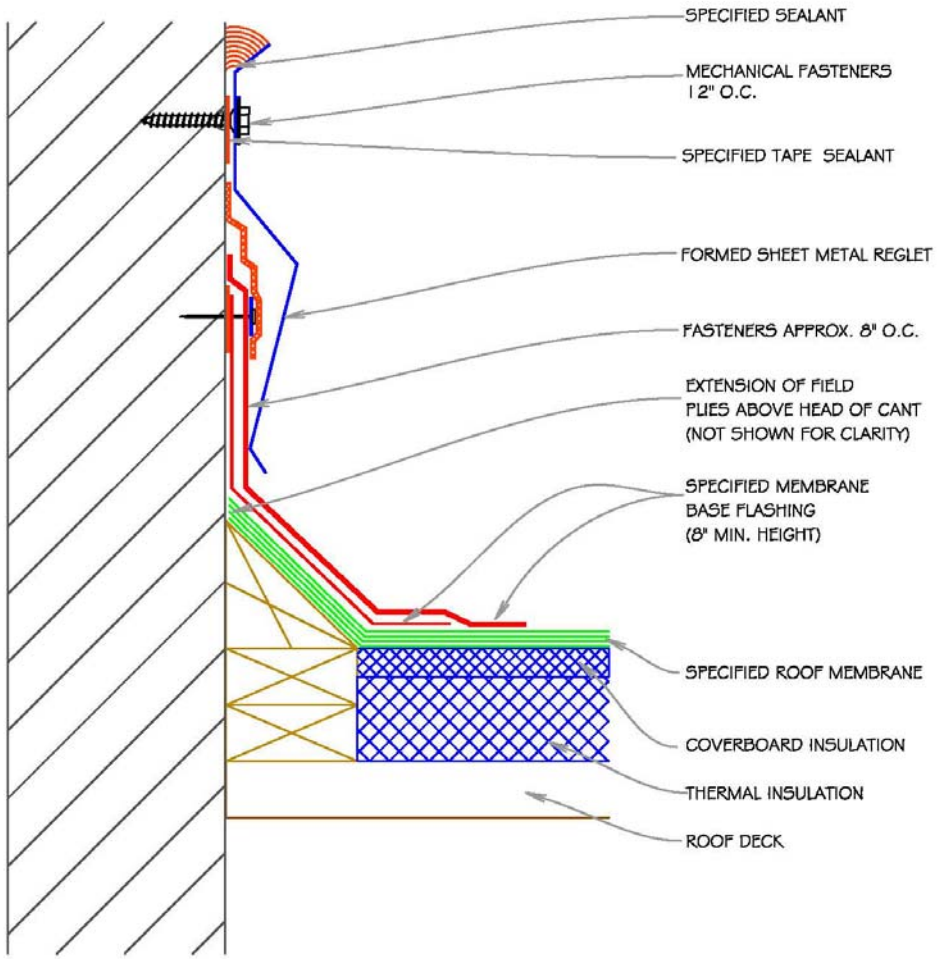
END OF SECTION 221426



OTES:

1. FOR COAL TAR AND ASPHALT TYPES I & II, INSTALL ENVELOPE (BITUMEN STOP) FOR A CONTINUOUS EDGE SEAL AT THE PERIMETER AND AT PENETRATIONS BYONE PLY OF A BASE SHEET OR TWO PLIES OF NON-PERFORATED ORGANIC ASPHALT SATURATED FELT BEYOND THE EDGE OF THE MEMBRANE FIELD PLIES AFTER ALL OVERLAPPING FIELD PLIES ARE IN PLACE, THE EXTENDED PLY S TURNED BACK INTO THE MEMBRANE AND ADHERED. THE ENVELOPE IS INTENDED TO PREVENT BITUMEN SEEPAGE FROM THE EDGE OF THE MEMBRANE.
2. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
3. DO NOT USE TYPE I TAR WITH POLYESTER OR TARRED GLASS FELTS ON SLOPES THAT EXCEED 1/4" PER FOOT, OR WITH TARRED ORGANIC FELTS ON SLOPES THAT EXCEED 1/2" PER FOOT.
4. REFER TO REF-10 (TABLE) FOR METAL THICKNESS AND CLEAT REQUIREMENTS.
5. FREQUENT NAILING OF SHEET METAL FLANGE IS NECESSARY TO MINIMIZE THERMAL MOVEMENT.
6. WOOD BLOCKING TO BE FASTENED IN ACCORDANCE WITH FACTORY MUTUAL LOSS PREVENTION DATA FM 1-49 FOR PERIMETER FLASHING DETAILS.
7. WOOD BLOCKING MAY BE SLOTTED FOR VENTING OF WET-FILL DECKS OR OTHER CONSTRUCTIONS WHERE APPLICABLE.

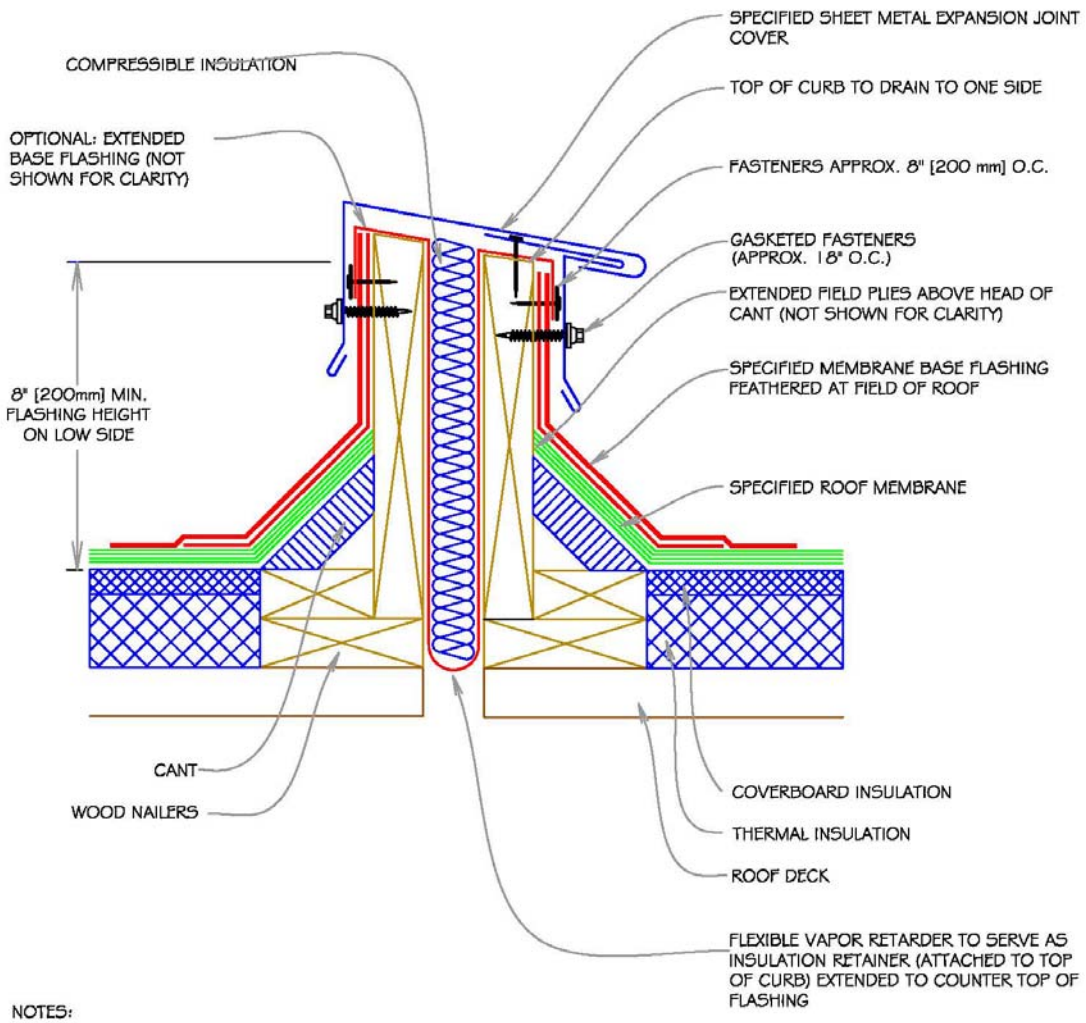
PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: EMBEDDED EDGE METAL FLASHING (GRAVEL STOP) FOR WALL SUPPORTED DECK	BMS-3A 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139



NOTES:

1. DO NOT OBSTRUCT WEEP HOLES WITH TOOLED SEALANT
2. BLOCKING FASTENERS NOT SHOWN FOR CLARITY.

PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: BASE FLASHING FOR WALL SUPPORTED DECK WITH SURFACE MOUNTED REGLET	BMS-05 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139

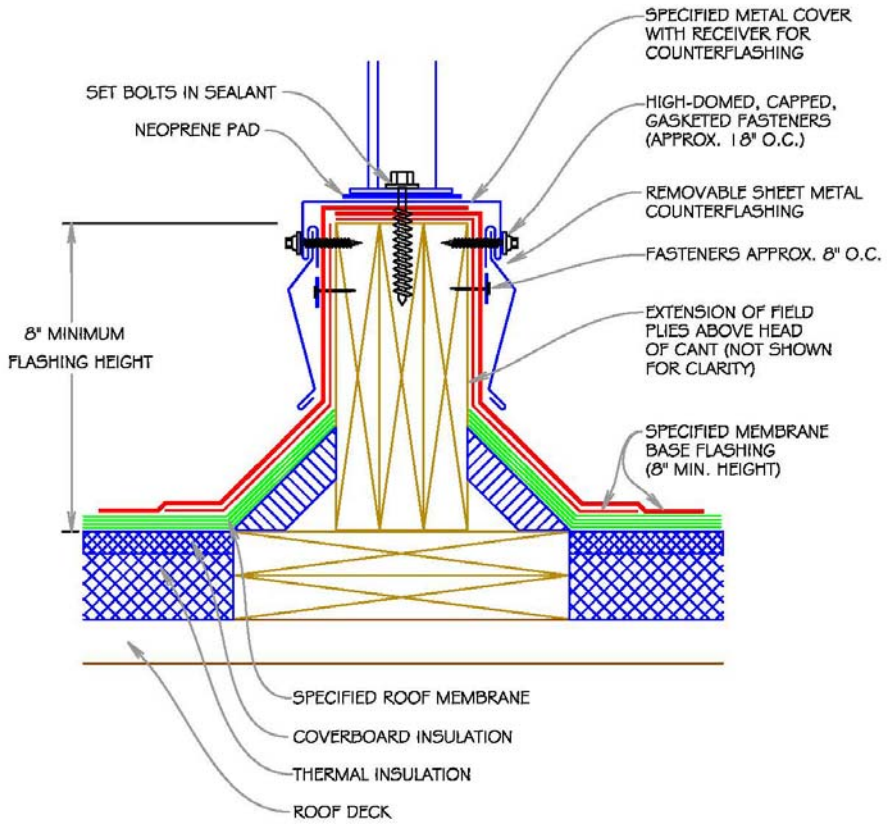


NOTES:

1. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
2. DO NOT USE TYPE I TAR WITH TARRED GLASS FELTS ON SLOPES THAT EXCEED 1/4" PER FOOT, OR WITH TARRED ORGANIC FELTS ON SLOPES THAT EXCEED 1/2" PER FOOT.

PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: EXPANSION JOINT WITH METAL COVER	BMS-09A 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139

WIDTH OF EQUIPMENT	HEIGHT OF LEGS
UP TO 24" [UP TO 600 mm]	24" [600 mm]
24" TO 48" [600 mm TO 1.2 m]	36" [900 mm]
48" AND WIDER [1.2 m AND WIDER]	48" [1.2 m]



NOTES:

1. A MINIMUM OF 2 FEET OF HORIZONTAL CLEARANCE MUST BE PROVIDED FOR REMOVAL AND REPLACEMENT OF ROOFING AND FLASHING BETWEEN PARALLEL SUPPORTS. A MINIMUM OF 3 FEET OF VERTICAL CLEARANCE FROM ROOF SURFACE TO BOTTOM OF SUPPORTED EQUIPMENT SHOULD ALSO BE PROVIDED.
2. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
3. OR WITH TARRED ORGANIC FELTS ON SLOPES THAT EXCEED 1/2" PER FOOT.

PROJECT :

PROJECT NAME HERE

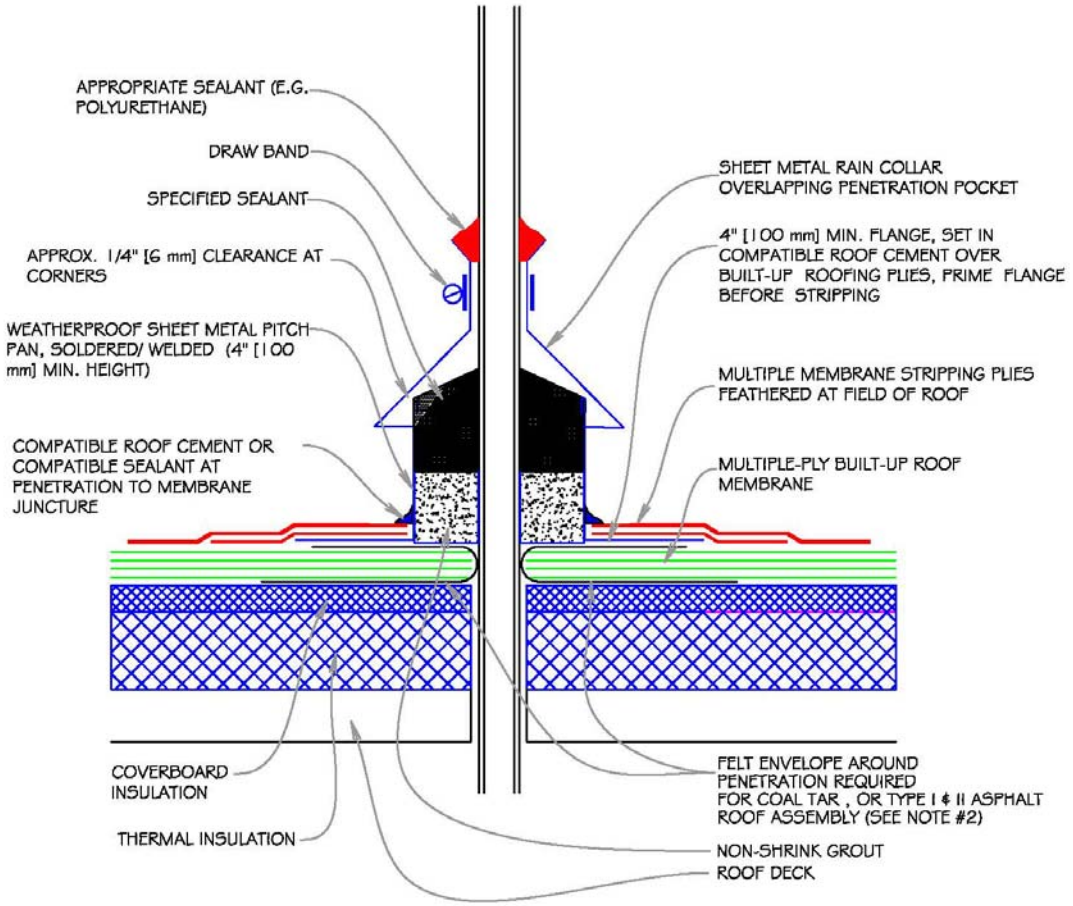
DETAIL:

EQUIPMENT SUPPORT CURB

BMS-11A
07/10
NTS

SR PRODUCTS
CUSTOMER SATISFACTION SINCE 1900

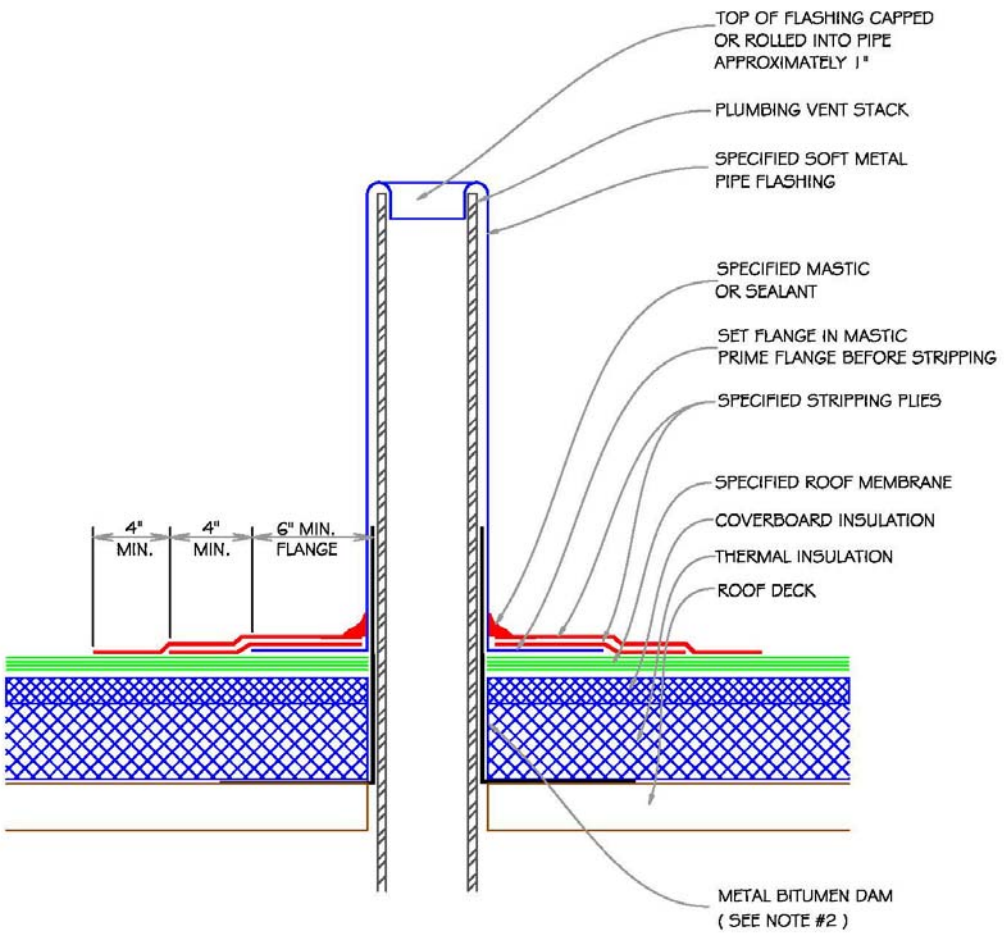
30505 BAINBRIDGE RD.
SOLON, OH 44139



NOTES:

1. PRIOR TO INSTALLATION, SEAL PENETRATION WITH ELASTIC FILL.
2. INSTALL ENVELOPE (BITUMEN-STOP) FOR A CONTINUOUS EDGE SEAL AT THE PERIMETER AND AT PENETRATIONS BY EXTENDING ONE PLY OF SPECIFIED BASE SHEET OR TWO PLIES OF NON-PERFORATED ORGANIC ASPHALT SATURATED FELT BEYOND THE EDGE OF THE MEMBRANE FIELD PLIES. AFTER ALL OVERLAPPING FIELD PLIES ARE IN PLACE, THE EXTENDED PLY IS TURNED BACK INTO THE MEMBRANE AND ADHERED. THE ENVELOPE IS INTENDED TO PREVENT BITUMEN SEEPAGE FROM THE EDGE OF THE MEMBRANE.
3. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
4. DO NOT USE TYPE I TAR WITH POLYESTER OR TARRED GLASS FELTS ON SLOPES THAT EXCEED 1/4' PER

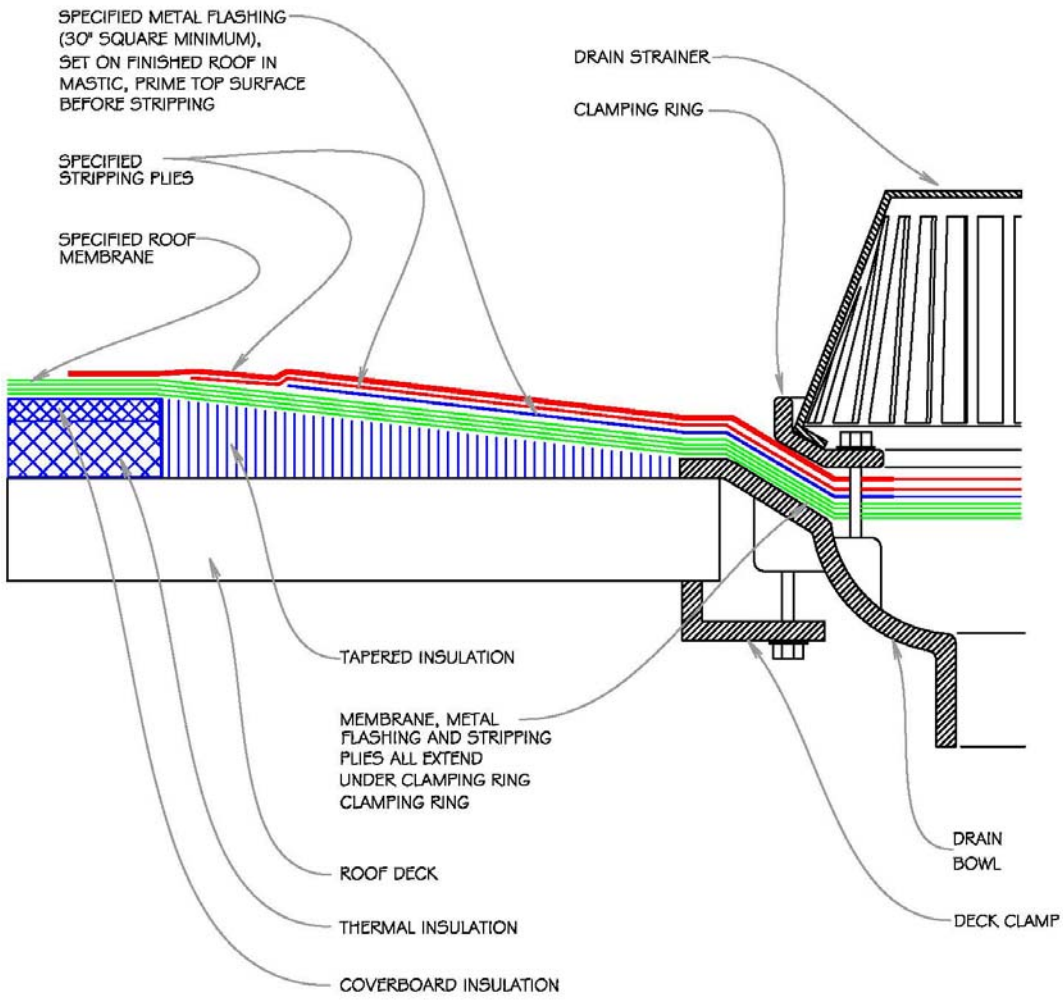
PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: PENETRATION POCKET WITHOUT BLOCKING	BMS-19B 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139



NOTES:

1. SHEET LEAD MINIMUM OF 2-1/2 LB PER SQUARE FOOT.
2. THE METAL BITUMEN DAM IS REQUIRED FOR COAL TAR BUILT-UP ROOFING. IT MUST EXTEND 2" ABOVE THE ROOFING MEMBRANE AND SET IN ASPHALT MASTIC ON DECK.
3. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
4. DO NOT USE TYPE I TAR WITH POLYESTER OR TARRED GLASS FELTS ON SLOPES THAT EXCEED 1/4" PER FOOT, OR WITH TARRED ORGANIC FELTS ON SLOPES THAT EXCEED 1/2" PER FOOT.

PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: PLUMBING VENT	BMS-21A 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139



NOTE:

1. DO NOT APPLY COAL TAR OR DEAD LEVEL ASPHALT INTO DRAIN SUMP. INSTALL METAL GRAVEL STOPS.
2. DO NOT USE MODIFIED COAL TAR ON SLOPES THAT EXCEED 1/2" PER FOOT.
3. DO NOT USE TYPE I TAR WITH POLYESTER OR TARRED GLASS FELTS ON SLOPES THAT EXCEED 1/4" PER FOOT, OR WITH TARRED ORGANIC FELTS ON SLOPES THAT EXCEED 1/2" PER FOOT.

PROJECT : PROJECT NAME HERE		SR PRODUCTS CUSTOMER SATISFACTION SINCE 1900
DETAIL: ROOF DRAIN	BMS-23C 07/10 NTS	30505 BAINBRIDGE RD. SOLON, OH 44139