####  SECTION 07 53 23

ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING

#### BASED ON DFD MASTER SPECIFICATION DATED (02/06/17)

**Note to Specifier:**

**Read the first paragraph after this statement, before proceeding.**

**Obtain and read the most current version of the DOA-DFD “Minimum Design Guidelines for Roofing and Waterproofing Systems”. Note the revision date at the title.**

This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add materials, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.

Recent changes in the specification are associated with the date by the title, identified by the ‘color green’. DO NOT DELETE THE DATE. Obtain the most current specification section for each project. Pay special attention to all ’Notes to Specifier’ identified in color of ‘dark red’ in italic typeface. Roof system options are also identified within [brackets] by the ‘color blue’. This language may be used or deleted as required by the scope of project. This section should be reviewed carefully as it has language for both new construction and re-roofing.

DFD Standard Roofing Details for various roof systems including HVAC and Electrical runs, curbs and support, louver, door and windows and State of Wisconsin Guarantee Forms are located on the DFD Website with the Master Roofing Specification.

part 1 - GENERAL

Scope

The work under this section includes all labor, material, equipment and related services necessary to install fully-adhered black EPDM membrane associated system components including metal flashing, all roof related construction and insulation.

PART 1 - GENERAL

 Scope

 Related Work

 Reference Standards

 Guarantee and Warranties

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 Submittals - Technical and Other Documents

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PART 2 - PRODUCTS

 Membrane Suppliers and Materials

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 Vapor Retarder

 Miscellaneous

PART 3 - EXECUTION

 Examination

 Site Conditions

 Substrate Preparation

 Installation of Vapor Retarder

 Installation of New Roof System

 Cleaning

RELATED WORK

Applicable provisions of Division 01 shall govern work under this Section. The Contractor shall consult these provisions in detail prior to proceeding with work.

[06 10 53.01 – Miscellaneous Rough Carpentry - Roofing]

[07 63 00 –Sheet Metal Roofing Specialties]

[26 41 00 – Facility Lightning Protection]

**Note to Specifier:**

“Lightning Protection Systems” that must be removed, altered, interrupted or disabled to perform the new work must be upgraded at the roof level. The Contractors qualified lightning protection system Installer shall submit a written statement that the roof level portion of the installation would\* qualify for a UL “Master Label”.

In the event that the Contractor wishes to make improvements in materials and/or techniques, or is required to make improvements by the membrane supplier in order to obtain guarantees/warranties, he shall make written request stating in full the nature of the proposed changes and stating that the changes, if approved, will be accomplished at no additional cost to contract.

**REFERENCE STANDARDS**

ANSI/SPRI – American National Standards Institute/Single Ply Roofing Institute.

ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate

[ASTM C208 - Insulating Board (Cellulosic Fiber).]

[ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.]

ASTM C1289-13e1 – Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

ASTM D4637 - Vulcanized Rubber Sheet used in Single Ply Roof Membrane.

NRCA ‑ Roofing and Waterproofing Manual.

UL ‑ Fire Hazard Classifications.

**GUARANTEE and warranties**

State of Wisconsin Roof System Guarantee: Provide written **five (5) year** guarantee warranting all roofing and flashing required under contract, to be watertight and free from defects in materials or workmanship for period of time, as stipulated in guarantee form.

Contractor shall perform a minimum of two (2) roof system inspections during the term of this guarantee. The first inspection shall be approximately two (2) years after installation date on five (5) year guarantee with final inspection performed within last 6-months of five (5) year guarantee. Contact the Agency Contact to arrange for a site visit date. Agency Contact will accompany the Contractor. Submit written inspection reports, e-mailed to Owner (DFD Project Manager) and Agency Contact immediately after inspection is performed and prior to guarantee expiration.

It is recommended that the Contractor take digital photos of the finished work for their files and future reference.

A copy of the required State of Wisconsin Roof System 5-yr Guarantee form shall be bound herein located at the end of this Section and may be acquired at the following State website; doa.wi.gov/DFD

**Contractor and all sub-contractors shall review the guarantee and requirements of this Section prior to providing a quote for the Work required by this Section.**

**Note to Specifier:**

The following shall apply for existing roof systems covered by State guarantee or manufacturer warranties.

**Note to Specifier:**

DFD Re-Roofing Project Manager and the membrane manufacturer must be notified of intent to penetrate the existing guaranteed and/or warranted roof system prior to approval of final bid documents. DFD shall provide information concerning the original approved roof system Contractor(s), existing guarantees & warranties. If required, the manufacture shall provide alternate approved Contractor information when original Contractor is not available. This information shall be included within the bid documents allowing the State to maintain the existing State Guarantee and/or various manufacturer warranties through their expiration dates.

**Example:** Where a state five (5) year guarantee is relevant the Contractor shall be included in bid document. When the state five (5) year guarantee has expired the membrane supplier shall be included in the bid documents to avoid losing the warranty.

**Note to Specifier:**

The following shall apply for existing roof systems no longer covered by State guarantee or manufacturer warranties.

**Note to Specifier:**

At minimum, request and insert a one (1) year or two (2) year State guarantee for all new construction projects and remodel projects including mechanical and electrical new work including penetrations or abandonment of existing roof penetrations that require minor roof system repair, minor replacement and/or new roofing material installed into a portion of the existing roof system to seam into the existing roof system membrane to achieve a watertight condition.

The Contractors Performance-Payment Bond is only required to apply to this trade section during the construction period and the first year of the guarantee period. Said Bond shall not apply to any extended guarantee period beyond the first year. Such extended guarantees are limited to the applicable Contractor and manufacturer as herein specified.

**Elastic Sheet Membrane Supplier Warranty:** Provide the membrane suppliers NDL (“No-Dollar-Limit”)/”Total System” warranty covering defects in workmanship, membrane and all associated roof system components supplied by the membrane supplier for a period of **twenty (20) years** from the date of installation

**Note to Specifier:**

Thirty (30) years – when using 90-mil.

**Roofing Contractor shall send application request for warranty(s) required herein to membrane supplier prior to start of Work.**

The following information shall be included on all guarantee and warranty documents:

State of Wisconsin (Owner), Agency, city or township, street address where work was performed, building name, Owner Project number, Owner (DOA) building number, all roof areas involved and total sq. ft. area of all roof areas.

Membrane supplier material and installation requirements may vary concerning issuance of the NDL (“No-Dollar-Limit”)/”Total System” warranty.

Include and provide all product(s), labor and installation methods necessary and as specified herein, including membrane supplier requirements not found specified herein, as required by the approved membrane supplier to obtain the specified warranty requested herein.

New membrane, insulation, shop fabricated and/or manufacturer fabricated metal flashing, pre-molded and/or factory supplied associated roof system products, their fasteners and/or all products used for adhesive and/or adherence purposes and sealants shall be covered by the membrane supplier NDL (“No-Dollar-Limit”)/”Total System” warranty specified herein and the State Guarantee.

Existing re-installed metal flashing and new wood blocking securement shall be covered in the State guarantee but not the membrane supplier NDL (“No-Dollar-Limit”)/”Total System” warranty specified herein.

Shop fabricated metal flashing materials as specified in section 07 63 00 and herein or as required for a complete watertight system may be provided in lieu of manufacturer fabricated metal flashing and shall be covered in the membrane supplier total system warranty specified.

**QUALITY ASSURANCE**

Refer to “Submittals - Technical and Other Documents” for number of submittal required.

A pre-construction meeting will be held at the site prior to the start of the work. See submittals required. All required submittals shall be delivered to the DFD Project Manager at the meeting for review, in the amount specified.

**Prior to the start of construction, it is required that the Contractor’s foreman shall be in attendance at preconstruction/pre-installation meeting(s).**

**Note to Specifier, This is a Mandatory Submittal:**

For new construction or remodel projects with tapered deck structure or tapered insulation systems, the Prime Contractor shall setup a meeting between the roofing contractor, plumbing contractor and other contractors as required to coordinate the final drain location. A final roof drain and scupper drawing shall be submitted to the Architect/Engineer for review and approval after all locations are established. All penetrations shall be reviewed such that they do not impede water flow. Saddles and crickets may be required to transfer water around such obstruction.

Roofing Contractor shall be recognized by the membrane supplier as an “approved” and “authorized” Contractor applicator of the roof membrane system and all associated products and components as specified herein.

Contractor shall have been in business for a minimum of three (3) years and within the past three (3) years the Contractor shall be able to document the successful completion of a minimum of three (3) projects of similar size and/or scope of the Work as specified in this Section. Backup documentation/verification may be requested by the Owner.

Roofing Contractor shall notify the membrane supplier in writing of their intent to obtain all system material and send application for the warranty for work required herein. Letterhead documentation shall be sent to the membrane supplier and include a current date, indicate the Owner Project Number, bid document technical Section(s), indicate in full the composition of roof system to be install per bid documents and be signed by the Roofing Contractor Representative.

Membrane supplier shall provide Roofing Contractor with a current date written documentation reply stating the receipt of Contractor request including warranty application and statement that the Roofing Contractor is an ”approved and authorized Contractor applicator” in good standing, for the work specified herein. A copy of this letterhead documentation shall be submitted to Owner at the preconstruction meeting. Such document shall include a current date, acknowledgement the Owner Project Number, bid document technical Section(s), include the roofing Contractor business name, certification status, year of issue and duration of such status.

SITE VISIT: Roofing Contractor shall notify membrane supplier of start date and arrange for membrane supplier to meet with the on-site foreman on the 1st or 2nd day after start of the Work. Notify the Agency Contact concerning the membrane suppliers visit so the Agency Contact may be present. A minimum of 1 visit is required.

Changes or variations to the roof system composition as required herein shall be approved by the Owner, in writing. Changes provided by the Contractor without Owner written approved shall be cause for rejection of the Work in its entirety.

Roofing Contractor on-site Foreman shall be approved by the membrane supplier and shall remain on-site throughout the duration of the project.

Contractor workers employed on this project shall be recognized by the supplier of the roof membrane system as “approved” or “authorized” applicator(s) and within the past two (2) years, the worker shall be able to document the successful completion of a minimum of three (3) projects of similar size and/or scope of the Work as specified in this Section.

All roofers by trade, and employed on this project shall have a certificate of successful completion of training for the system to be installed. Undocumented roofers shall not be allowed to perform the work required herein pertaining to the physical placement/installation of any and all of the roof system components specified herein.

Membrane supplier certificate of successful completion of training for each roofer employed on this project shall be submitted to Owner. Document shall be up to date, indicate worker name, certification status, year of issue and duration of such status.

Contractor shall provide a list of all workers to be employed on this project. The list shall indicate each of the workers by name and their construction trade including the Project foreman and Contractor main office contact person.

List shall include after-hour/weekend emergency phone contact personal and their office and cell phone numbers, for use in case of emergency situations.

Labors, sheet metal workers or other non-roofer employees shall not be allowed to perform the actual installation of any part of the membrane suppliers warranted roof system required by this Section without manufacturer documentation of proper training, as required herein.

**Note to Specifier:**

For Projects with AE, Agency or Owner over-site, Roofing Contractor MUST submit the specified amount of membrane supplier’s current paper-print installation and detail manual.

Contractor shall obtain and provide Owner with the membrane suppliers most current dated three (3) ring or spiral bound installation and detail manual.

Contractor shall perform work required using details provided within the specifications, on the drawings or as required by the membrane supplier for a proper watertight installation and to allow issuance of warranties required herein.

All system components not specifically identified herein but required by the membrane supplier for the roof system installed by the Work required in the Project Manual shall be provided and included in the membrane supplier watertight warranty as required herein. System components required by the Work in the Project Manual but otherwise not warranted by the membrane supplier shall be upgraded to be membrane supplier specific products at the time of bid such that they are covered by the warranty required herein.

Provide all equipment recommended by the membrane supplier for proper installation of the materials specified.

Roofing installations shall comply with fire resistive rating as defined in the Wisconsin Administrative Code. Required rating on these roofs: U.L. Class A.

It is the responsibility of the General Prime Contractor to obtain the services of competent licensed sub-contractor’s to perform the Work associated with these bid documents.

Electrician Contractor: For removal and reinstallation of roof curb-mounted exhaust fans and associated covers, ventilators, electrical equipment associated wiring connections at the unit(s) as required to perform the Work.

Agency is responsible for disconnect where wiring must be pulled or cut and conduits relocated to allow installation of the new roof system.

Plumber Contractor: To re-lead drain pipe, repair and/or reset the roof drain bowls to interior piping as required to perform the Work required on this project.

Mechanical Contractor: For removal of belt, chain driven and/or electrical exhaust fans and associated flex connection and duct runs/piping and its associated roof curb penetration.

The Contractor shall raise all existing mechanical and electrical trades’ roof system penetrations to a minimum height above the roof system of 8”.

Contractor shall notify the Agency Contact 24 hours in advance of all Electrical, Plumbing and Mechanical disconnections.

**Note to Specifier, Used for Existing Conditions:**

Lightning Protection Contractor: For removal, re-installation, replacement of broken components and written verification as stated in specification section 26 41 00 of existing cabling, lightning rods, associated products and proper anchoring, fastening and/or adherence of all of cabling and rods and/or rod base plates. Verify that this installation does not interfere with the proper installation of the roofing metal flashing and its clip/cleat fastening point. The lightning protection system rods shall not be installed nor fastened to any horizontal portion of the roof system metal flashing or coping.

It is the responsibility of the Agency to perform inspection of the roof areas to be replaced by this project and to provide the following services:

Agency is responsible for the following: Existing Electrical, Plumbing and Mechanical installations and associated equipment pipe and duct runs shall be identified/verified by the State Agency as in use or be spray painted in ORANGE by the Agency if they are abandoned or shall be abandoned and shall be removed by this roofing Contractor, and verify that the electrical run is terminated, prior to start of work by Contractor. Electrical conduct runs lying directly on the existing roof membrane, or fastened to perimeter wall or metal flashing or coping shall be relocated by the Agency prior to start of work.

**PRODUCT DELIVERY, STORAGE AND HANDLING**

Make no deliveries to the project site until ready to install or approved storage is provided. The State will not accept delivery nor will the State be responsible for any materials or equipment stored on the premises.

Deliver materials in original unopened containers of packaging clearly labeled with manufacturer’s name, brand name, instructions for use, all identifying numbers and U.L. labels.

Deliver materials in sufficient quantity to allow continuity of work.

Materials used on the job must be stored in such a manner as not to create a nuisance or hazard.

Store materials on clean, raised platforms, with breathable, weather protective covering when stored outdoors. Provide continuous protection from materials against weathering and moisture absorption.

Factory applied "shrink-wrapping" is not considered to be an acceptable weather protective covering. Improper storage practices will be grounds for rejection of questionable materials.

Store flammable products away from spark or open flame.

Store primers, coatings, sealants and similar materials between 60 degrees and 80 degrees Fahrenheit.

Contaminated and Damaged Materials: Remove damaged or contaminated materials from site.

DO NOT store materials in a manner which will overload any portion of the building.

Handle all materials in a manner which will not damage the material. All damaged materials shall be removed from project site.

Select and operate material handling equipment and store materials as not to damage existing construction or applied roofing, and without overloading the building structural system.

**SUBMITTALS - TECHNICAL AND OTHER DOCUMENTS**

**At the preconstruction meeting and prior to start of work,** **submit the following for approval by Owner.**

Prior to the start of any work, all of the following submittals as required herein, shall be brought to the pre-construction meeting in the amount specified, for review and approval by DFD Project Manager.

The following information shall be included on all submitted documents:

Agency/Location/Address where work is performed obtained from the Agency Contact listed to include Building Name, Bldg. State Number, Roof Areas, DFD Project Number and total sq. ft. of all roof areas.

MEMBRANE SUPPLIER WARRANTY ACKNOWLEDGEMENT

Upon receiving the Contract Offer from the Owner, Contractor shall immediately notify the membrane supplier of intent to purchase the product and to obtain the warranty as specified by this Section.

**Submit**: Three (3) copies of the Contractors dated notification letter sent to the membrane supplier.

**Submit:** Three (3) copies, on membrane supplier letterhead, stating acknowledgement of such notice and agreement to provide the warranty required by this Section. The letterhead acknowledgement shall include the date such letter was issued, Owner Project title, Project number, Section number(s), membrane supplier representative signature and be addressed to the Roofing Contractor.

CONTRACTOR AND WORKER QUALIFICATION

**Submit:** Three (3) copies of the membrane suppliers current written documentation stating the Contractor is an ”approved Contractor applicator” in good standing, for the work specified herein shall to be submitted to Owner at the preconstruction meeting. Document shall be up to date, indicate Contractor name, certification status, year of issue and duration of such status.

**Submit:** Three (3) copies of the membrane supplier’s certificate of successful completion (If available from membrane supplier) of training for each roofer employed on this project shall be submitted to Owner at the preconstruction meeting. Document shall be up to date, indicate worker name, certification status, year of issue and duration of such status.

**Submit:** Three (3) copies of a list of all workers to be employed on this project. The list shall indicate each workers name and trade. Project supervisor and main contact person shall be identified. (See Quality Assurance herein)

ROOF DRAIN VERIFICATION

**Submit:** Three (3) drawing copies indicating location of coordinated drain and scupper locations. For new construction or remodel projects with tapered deck structure or tapered insulation systems, the Prime Contractor shall setup a meeting between the roofing contractor, plumbing contractor and other contractors as required to coordinate the final drain location. A final roof drain and scupper drawing shall be submitted to the Architect/Engineer for review and approval after all locations are established. All penetrations shall be reviewed such that they do not impede water flow. Saddles and crickets may be required to transfer water around such obstructions. (See Quality Assurance herein)

MEMBRANE SUPPLIER INSTALLATION INSTRUCTIONS

**Contractor shall submit specified amount of manufacturer’s current paper-print installation and detail manual to be used for on-site inspection/verification of work performed.**

**Submit:** One (1) copy of the membrane suppliers most current version, complete edition paper-copy installation and detail 3-ring or spiral bound manual. Partial submittals taken from within the bound manual are not acceptable.

**Submit:** Web-site information to allow access to membrane supplier’s most current installation and detail manual.

EMERGENCY AND OFFICE CONTACT PHONE LIST

**Submit:** Three (3) copies of the Contractor’s office superintendent and job foreman daytime, after hours and weekend office and cell phone numbers to be given to the Agency Contact at the pre-installation meeting.

MATERIAL LIST

**Submit:** Three (3) copies of a list of all materials intended for use on the project, to include roofer and all other sub-contractor composite system materials, starting at the roof deck and identified by manufacturer's name, size, thickness, type or grade. List shall be submitted on Roofing Contractor's letterhead stationery. Submit product data sheets as required.

Contractor shall state the following at the bottom of the material list submittal:

**“New products installed on this project do not contain asbestos”.**

RECYCLED MATERIALS:

**Submit:** Three (3) copies of a materials recycle plan to Owner for review. Include recycle business name, address, contact, and phone number where all recycled roofing material removed by this project will be delivered.

**Note to Specifier:**

When removing an existing roof where existing materials might contain asbestos, insert the following paragraph(s).

[ASBESTOS TESTING

**Submit:** Three (3) copies of test results including a drawing indicating location where tests samples are taken. Contractor replacing the roof system is required to take a minimum of two (2) samples of existing roof system(s) components encountered starting at the roof deck including existing vapor retarder, to be sent to a testing lab. Take (1) sample at the base flashing and one (1) sample from the field of the roof. Additional samples are required where roof areas are not of the same roof system or installation period. Each test result shall properly identify the Owner Project No., project location, bldg. name, bldg. number & roof area/location where the test sample was taken. Test lab and associated removal and disposal charges shall be the responsibility of the Contractor at no additional cost the project.

A Contractor owner or employee shall have taken the exterior asbestos supervisor course and possess current documentation that they are an ‘Exterior Asbestos Supervisor’ able to take existing roof system samples as required to be tested for possible asbestos contamination.

All workers removing asbestos must be certified to perform the work.

ASBESTOS – POSITIVE RESULTS

**Submit:** Three (3) copies of the necessary regulatory notifications for asbestos removal or three (3) copies of core sample test results indicating the roofing materials slated for removal do not contain asbestos. (Refer to General Requirements Article “HAZARDOUS SUBSTANCES – ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB’S)” for additional information.)

**Test lab results must be submitted prior to start of work]**

SAFETY REPORT

**Submit:** One (1) copy of a written report to be given to the Agency Representative at the preconstruction meeting, describing in detail the Contractors implementation of specific OSHA regulations, Contractor’s worker safety program methods/means, roof perimeter safety and identification of the “watch person” required at all roof levels. Identify fire extinguisher and their locations, all equipment/operators on roof/ground in setup/storage area and travel routes used while performing the work.

[TAPERED INSULATION DRAWING:

**Submit:** Three (3) copies in addition to the number of copies the Contractor needs returned, of insulation supplier's shop drawings showing the layout of the tapered insulation. Shop drawings shall show actual locations and sizes of all roof drains and other pertinent rooftop equipment.]

**Note to Specifier:**

The Following Two (2) Paragraphs are Apply for New Construction or Plumbing Remodel Projects.

[General Contractor shall setup a meeting between the roofing contractor and plumbing contractor to coordinate the final drain location.

The Contractor tapered insulation drawing shall be submitted to the Owner for approval after drain locations are established.]

Roofing Contractor and supplier shall not scale the bid documents to establish the drain layouts.

Roofer shall verify that the submitted and approved tapered insulation drawing layout starts at the established drain bowl.

Tapered insulation installed contrary to the low point of the drain, over flow or scupper locations shall be cause for rejection of the work and therefore shall be removed, at no cost to the project, and re-installed to start at the drain bowl.

MSDS DATA:

**Submit:** One (1) copy of all MSDS paperwork for each products used on this project to be given to the Agency Representative at the preconstruction meeting.

CONTRACTOR ON-SITE APPROVED DOCUMENTS

Contractor shall maintain at least one (1) copy each of the construction set specification and drawings, addenda, value enhancement, “Request for Information” (RFI), “Construction Bulletin” (CB) and “Change Order” (CO) documents and all other approved signed submittals on site throughout construction.

Contractor shall maintain at least one (1) copy of the latest version of the membrane suppliers handbook including details and technical information concerning application techniques for all primary roofing system materials required by the work.

Contractor shall maintain at least one (1) copy of the Material Safety Data Sheets (MSDS) manual for all materials including those used on this project.

**SUBMITTALS – FINAL DOCUMENTS REQUIRED UPON COMPLETION OF THE WORK:**

**Prior to final payment, submit the following to Owner as one (1) package including a cover page listing all documents sent:**

The following information shall be included on all guarantees, warranty and other submittal documents:

Agency, city or township, street address where work was performed, building name, Owner Project number, Owner (DOA) building #, all roof areas involved and total sq. ft. of all roof areas.

**Note to Specifier;**

Require Contractor to take digital photo records, as required.

DIGITAL PHOTOS:

**Submit:** One (1) copy of a CD with all photos taken.

Provide digital camera photos throughout the project as required by these specifications and/or requested by Owner.Contractor shall take multiple digital camera photos of the following to be submitted electronically, via e-mail to Owner. **Cell phone photos are not acceptable.**

Contractor shall take and submit digital camera photos’ of the various difficult watertight locations and mechanical fastening that will be hidden from view or otherwise concealed beneath the completed work. Multiple photos shall be taken of the entire installation starting at the roof deck and continuing throughout the roof system installation as it progresses in layers, as required per specification

Contractor shall take and submit digital camera photos of all changes to the scope of work to include existing conditions as the work takes place in its various stages of demolition and of the new Work as it takes place throughout its various stages.

Provide digital camera photos of the completed work. Photos shall include the various metal flashing details, transitions and penetration height changes and in general an over-all view of the field of all roof areas. Photos shall be identified by the roof area where photos are taken.

[RECYCLED MATERIALS

**Submit:** Three (3) copies of a completed material recycle plan to Owner for review. Include recycle business name, address, contact, and phone number where all recycled roofing material removed by this project will be delivered.

Upon completion, Contractor shall submit a final summary of the progress reports, including the percentage of recycled waste (weight or volume) to the quantity of waste that would have been otherwise land filled.

Submit recycler receipt for all deliveries showing all received product their weight and % calculation as described in GENERAL REQUIREMENTS, Article 38.

Submit a final summary of the progress reports, including the percentage of recycled waste (weight or volume) to the quantity of waste that would have been otherwise land filled.

Submit recycler receipt for all deliveries showing all received product their weight and % calculation.

Material kept for reuse and delivered to the Contractor’s property or given away at the site by the Contractor shall be identified as well. The total sq. ft. bulk sum of all material shall be recorded and submitted.

[Contact the following or another recycling company to arrange for pickup of EPDM and/or whole-piece insulation intended for disposal by the Contractor.

“Nationwide Foam, Inc.”: Recycles insulation and will arrange for flatbed drop off and removal at a cost less than landfill fees. Contact: Ken Wardrop at (888) 820-2760 Ext. 29 or e-mail at ken@nationwidefoam.com.

Contact local concrete companies or earth fill providers concerning disposal of existing concrete and/or stone ballast.

Contact a metal recycling company for metal debris containers, pickup or delivery of metal debris intended for disposal.]

**Note to Specifier;**

Delete the following waste manifest requirement where BUR system or vapor retarder are not involved in existing roof system removal.

[WASTE MANIFEST:

**Submit:** Two (2) copies of the Waste Manifest Records to DFD Project Manager if required in accordance with General Requirements Article “HAZARDOUS SUBSTANCES – ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB’S)”.]

[AS-BUILT DRAWING:

**Submit:** One (1) Drawing: Fully dimensioned as-built roof plan showing all seam and patch locations, actual locations and sizes of roof drains, vents, fans, etc.]

[AS-BUILT DRAWING:

**Submit:** One (1) Drawing: Fully dimensioned as-built roof plan showing actual locations of all wet areas removed and the actual dimension of each area.]

STATE OF WISCONSIN ROOF GUARANTEE:

Submit one (1) original guarantee as required herein. (Refer to GUARANTEE article in Part 1 of this Section).

MEMBRANE SUPPLIER ROOF WARRANTY

**Submit:** One (1) of the original membrane suppliers warranty of all membrane warranties required herein. (Refer to GUARANTEE article in Part 1 of this Section).

MISCELLANEOUS METAL WARRANTY:

**Submit:** One (1) original of manufacturer warranty as required by Specification Section.

[LIGHTNING PROTECTION CERTIFICATION**:**

**Submit:** One (1) original document of all testing required by Specification Section 26 41 00.1).]

SETTLEMENT CERTIFICATE [AND WAGE RATE AFFIDAVIT]:

**Submit:** One (1) copy of each document.

The following information shall be included on all submittal documents.

Agency/Location/Address where work is performed to include the Building Name, Bldg. State Number, Roof Areas, Owner Project Number and total sq. ft. of all roof areas.

PART 2 - PRODUCTS

**membrane Suppliers and Materials**

All products used in this installation shall be compatible with one another and the membrane intended for use.

Owner has pre-approved specific membrane manufacturers and membrane suppliers whose membrane is labeled specifically for them.

Approved Membrane Manufactures and Membrane Suppliers:

Carlisle SynTec Systems; Manufacturer.

Firestone Building Products; Manufacturer.

GenFlex LLC: Supplier - Membrane manufactured by Firestone Building Products.

Johns Manville; Manufacturer.

Mule-Hide Products Co. Inc.; Supplier - Membrane manufactured by Carlisle SynTec Systems.

Versico Roofing Systems; Supplier - Membrane manufactured by Carlisle SynTec Systems.

Manufacturer shall have had membrane in production and use on roof systems for a minimum of ten (10) years.

Unapproved manufacturer and/or supplier products installed on the Project shall be cause for rejection of the roof system in its entirety and shall be completely replaced at no cost to the Project.

All associated products required by the manufacturer and membrane supplier for proper, complete and warranty specified installation of the specified membrane shall be approved and provided by the approved membrane manufacturer.

Use new materials only; salvaged or used materials are unacceptable and shall be removed from the site and be recycled.

Membrane: ASTM D4637, Type I; Non-reinforced black 60-mil EPDM (Ethylene Propylene Diene Monomer) elastomer.

***Note to Specifier:***

**White EPDM** is NOT an acceptable alternate membrane..

**Concrete or LG-Board** is NOT an acceptable alternate for a ballasted system.

**Stone ballast roofs** have a shorter life expectancy and are therefore NOT recommended unless reusing stone on re-roof project, as a cost effective method. Verify that salvaged stone is not contaminated with sharp debris from other trades.

**45-mil membrane i**s NOT recommended for long life roof systems.

**90-mil membrane** are used when longer life roof system is required and where in conjunction with metal roof systems. Request a thirty (30) year NDL.

Uncured Flashing: Uncured black 60-mil EPDM elastomer as recommended by the membrane manufacturer or membrane supplier.

Cured Flashing: ASTM D4637, Type I; Non-reinforced black 60-mil EPDM elastomer as recommended by the membrane manufacturer or membrane supplier.

Bonding Adhesives, Cements, Tapes, Sealants and Accessories: Foam and solvent based adhesives and related prepping and cleaning agents required for the installation of a fully-adhere system membrane, seams, membrane flashing, membrane to insulation, insulation to insulation and deck shall be approved and supplied by the approved membrane provider.

**Water-base adhesives:** These products are not an acceptable for use in cold climate.

**Asphalt:** is NOT an acceptable insulation adhesive. [Unless specific conditions, like existing roof tie-in, require its use to adhere to the existing concrete deck or existing vapor retarder.]

Perimeter Securement Strip: ASTM D4637, Type II; reinforced, 60 mil EPDM elastomer as recommended by the membrane manufacturer or membrane supplier.

Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A or O; FS TT-S-00230C, Type II, Class A; one-part polyurethane base, elastomeric joint sealing compound such as Sika Chemicals "Sikaflex 1a", Sonneborn-Contech "Sonolastic NP1" or Tremco "Vulkem 116" or “Dymonic".

**Note to Specifier:**

It is required to design roofs in accordance with the provisions of the State Energy Code relative to system “U” value. When specifying tapered insulation, use average thickness for basis of calculations.

**INSULATION**

Tapered Insulation: ASTM C1289 – 13e1, Type II, Class 1, Grade 2; rigid board Polyisocyanurate insulation with felt or fibrous mat facing on both sides, factory tapered to per foot slope.

Tapered insulation board shall have a start thickness at the perimeter of the roof drain of 1/2”. Maximum board size = 48” x 48”; maximum board thickness (including fill boards) = 2-1/2”. Insulation system design and layout drawing provided shall indicate a minimum of two (2) layers to allow for staggering of insulation joints in both directions.

Polyisocyanurate: ASTM C1289– 13e1, Type II, Class 1, Grade 2; rigid board insulation with felt or fibrous mat facing on both sides. For mechanically attached boards, maximum size = 48" x 96"; for adhered boards, maximum size = 48” x 48”. Thickness = As required by construction drawings or “New Work Report”. [1-1/2”] [2.0”]. Insulation system design and layout drawing provided shall indicate a minimum of two (2) layers to allow for staggering of insulation joints in both directions.

**As of January 01, 2014 Polyisocyanurate board/tapered stock R-values are changed to meet advances in testing methodology to meet the new ASTM C1289-13e1 testing methods. Example; 1” is now rated to equal R5.6. It will now require flat stock Polyisocyanurate equaling 4.5” or a calculated tapered Polyisocyanurate insulation system to achieve a minimum average of R25.2 .**

***Note to Specifier:***

Factory tapered to [1/8” - use when re-roofing] [1/4” - use in new construction] [1/2” or more– use in new construction as required]

Roof drain sump of 1/2” and shall not exceed a maximum slope of 3/4” within the sump area.

OPTION to Tapered Polyisocyanurate insulation - Expanded polystyrene must equal Polyisocyanurate “R” value required by the specification and/or drawings.

Average R-value to be achieved by the new roof system shall be stated on the drawings or within the roofing specification.

Tapered insulation layout drawing submittal shall state the average R-value to be achieved by the new roof system prior to approval of the system.

[Tapered Insulation Option: ASTM C578, Type IX; expanded polystyrene rigid board insulation factory tapered to per foot slope. Tapered insulation board shall have a start thickness at the perimeter of the roof drain sump of 1/2”. Maximum board size = 48” x 48”; maximum board thickness (including fill boards) = 2-1/2”. Insulation system design and layout drawing provided shall indicate a minimum of two (2) layers to allow for staggering of insulation joints in both directions.]

“Cricket” and “saddle” tapered board shall be factory supplied and tapered as required and/or specified to properly direction water flow to the nearest drain or scupper.

On-site fabricated “cricket” or “saddle” tapered insulation installations are not acceptable and shall be cause for rejection of the Work.

[Wood Fiber: ASTM C208, Type II, Grade 1; 1/2" high-density wood fiber rigid board insulation.]

**Vapor Retarder**

***Note To Specifier:***

See DFD Master Roofing Specification 07 51 13 concerning placement of organic vapor retarder over substrate.

[**None required**]

[Vapor Retarder: Minimum requirement: 6 mil Polyethylene sheeting.]

[Vapor Retarder: Consisting of two (2) plies No. 15 organic felt set into full mopping of (minimum twenty five (25) pounds per square) of hot asphalt directly adhered to the [concrete] thermal barrier mechanically attached to the steel roof deck. Thermal barrier shall be attached to the steel deck with a minimum of eight (8) fasteners per 4x8 board or manufacturer’s requirements, whichever is more conservative.]

[Vapor Retarder: Membrane supplier’s approved self-adhered vapor retarder with a perm rating of .5 or less directly adhered to the [concrete] [thermal barrier mechanically attached to the steel roof deck. Thermal barrier shall be attached to the steel deck with a minimum of eight (8) fasteners per 4x8 board or manufacturer’s requirements, whichever is more conservative.]

**MISCELLANEOUS**

***Note To Specifier:***

**“Densdeck” Type** overlay hard board/ protection board installed directly below membrane is considered an unnecessary expense and is NOT required nor acceptable in roof systems.

**Membrane/Ballast Felt** between stone ballast and membrane is considered an unnecessary expense and is NOT required nor acceptable in roof systems.

Plumbing Vent Flashing: Pre-molded boot with stainless steel draw-band clamp shall be approved and supplied by the membrane supplier.

Termination Bar: ASTM B209, Series 3000, Temper H-14; minimum 0.10" thick, 1.25" wide aluminum with reverse bend for sealant application along top edge shall be approved and supplied by the membrane provider.

Fasteners shall be approved and supplied by the membrane provider.

For Fastening Perimeter Securement Strip: Polymer coated screw and plate as recommended and supplied by the membrane supplier.

For Fastening Membrane to Wood: 1-1/4" galvanized roofing nails through 1" metal discs.

For Fastening Termination Bar to Concrete or Masonry: Zinc alloy expansion shield with hardened steel pin.

Pavers: Concrete pavers intended for rooftop use. Standard, nominal 2’ x 2’ x 2”.

2" x 8" x 16" concrete pavers are not acceptable.

Manufacturer EPDM walk pads are not preferred over 2’ x 2’ x 2” concrete pavers.

[Ballast: Minimum nominal size 1-1/2" [2”] diameter, smooth river bottom stone or as required by membrane supplier.]

[Reuse existing saved stone ballast that appears clean and free of other trades debris, is river run solid stone, average size 1-1/2” or 2”. Split or decaying stone and stone smaller than 1-1/2” shall not be considered for re-use.]

[Provide ballast and additional ballast as required to replace removed concrete or other ballast per ANSI/SPRI document RP-4. “Wind Design Standard for Ballasted Single-Ply Roofing Systems”.]

Pourable Sealer: 2-part polyurethane or other sealer intended for use by the membrane provider to seal provider approved penetrations accessories components. Sealer and penetrations accessories components shall be included in the membrane supplier warranty. Specified products noted on bid documents shall be upgrade to be provider’s products and shall be included in required warranty.

Other products, not specifically described, but required for a complete and proper warranted system installation as required by this section shall be selected by the Contractor to be included in the Work, identified on a materials list and subject to the approval of the Owner.

part 3 - EXECUTION

**EXAMINATION**

Examine the areas and conditions under which work in this section will be installed. Notify the Owner of any conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

**SITE CONDITIONS**

Apply roofing in dry weather. All roofing materials installed during rain shall be removed and replaced with dry materials at the Contractor's expense.

DO NOT apply roofing unless authorized by the Owner when the working hour’s ambient temperature is below 32 degrees Fahrenheit. Under no circumstances will any seaming, flashing or adhesive activities be allowed when the ambient temperature is below 20 degrees Fahrenheit, or the wind chill factor is below 0 degrees Fahrenheit.

Existing materials designated to remain, which are damaged or defaced as a result of the work shall be replaced at Contractor's expense to like new condition.

Install all rooftop mounted equipment in a watertight manner and repair any damage to sheet metal or other components related to connection and protection of the roof system.

Prevent materials from entering and clogging roof drains and conductors. Remove roof drain plugs when no work is taking place or when rain is forecast.

Protection of surfaces: Take every precaution to prevent water leakage, or debris falling into the building interior, or other such occurrences. Contractor is responsible for any and all damage to the building interior or its contents that occur as a direct cause of the Work and due to the Contractors methods and mean practice to accomplish the Work required herein.

Provide special protection or avoid heavy traffic on completed work. Temporary protection shall be erected/installed at all interior and exterior locations as required to prevent damage and/or marring of the existing surface. Walkways and work platforms shall be provided as necessary.

Wall surfaces shall be protected with tarpaulins or other suitable cover to prevent damage, staining or discoloration that might result from operations such as removal, disposal, replacement or removing of equipment or materials to the roof surface. Windows, doorways, docks, walkways, etc. may require special protection measures.

Disposal of materials: All materials to be disposed of shall be loaded directly into trucks by means that will prevent damage to existing or new surfaces and to control pollution. Free-fall of debris from heights over 15’ will not be allowed.

Contractor is responsible for any charges, such as landfill fees, incurred for disposal of materials.

**Proceeding with the work shall signify the Contractor’s acceptance of the substrate being covered by this Work.**

***Note to Specifier:***

Architect/Engineer shall include a note on new construction roof drawing and plumber drawing bid documents requiring the General Contractor to call a meeting between the roofing contractor and plumbing contractor to coordinate the final drain location. Tapered insulation drawing shall be re-submitted to the AE after drain locations are approved by all, in writing. Tapered insulation installed contrary to the low point of the drain, over flow or scupper locations shall be cause for rejection of the work.

 Approved tapered insulation drawing layouts shall be reviewed by the Contractor installing the work in this section prior to start of such work, and before ordering the materials, to assure that the tapered insulation layout will correspond with the exact location of new and/or existing roof drains and primary through-wall and/or roof edge drain scupper locations.

Tapered insulation systems that are not installed such that they drain directly and positively to the roof drain shall be removed and installed correctly by the roofing Contractor at no additional cost to the project.

***Note to Specifier:***

Designer must calculate insulation depth to be achieved by the new tapered roof system design at all roof edge, outer wall and roof-to-wall intersection and properly identify structural wall/wood blocking height requirements in relation to metal flashing coverage and counterflashing receiver height.

**SUBSTRATE PREPARATION**

Plan work and take whatever action is necessary to prevent dirt and debris from entering the building during the Work required by this Section.

***Note to Specifier:***

If required, insert language relative to removal and disposal of existing roofing system. Include archival information on existing materials, if available.

**[See Existing and New Work Report after this section – *used when and if reports are developed to understand existing roof conditions and new roof installation requirements*.]**

[For concrete decked areas only, an existing bituminous vapor retarder, if found to be present, may remain if well adhered.]

[Remove existing stone ballast and stockpile on the ground for reuse.]

[Agency may have a location on site to dispose of stone ballast not intended for reuse.]

All vertical surfaces to receive new flashing materials shall be thoroughly cleaned of existing adhesives, sealants, bituminous materials, etc.

Verify that wood blocking, curbs and nailers are securely anchored and that roof openings and penetrations are in place and set and braced. Verify that roof drains are properly clamped into position.

Pressure Treated Plywood and Lumber: These products shall not be specified or provided for use in roofing projects as a substrate material intended to receive mechanical fasteners used to secure metal roof panels, panel clips, metal coping, roof penetration curbs cap and Counterflashing, all other metal flashing, roofing insulation and membrane installations that are a part of the roof system.

The membrane supplier shall approve of all mechanical fasteners used to secure all roof system components.

Contractor shall take multiple digital photos to be submitted electronically to the Owner showing the various locations and types of mechanical fastening that will be hidden from view or otherwise concealed beneath the completed roof system.

Verify that the substrate is clean, dry and free from sharp projections and depressions and that all surfaces and site conditions are ready to receive new materials.

[Bottom flanges (ribs) of steel deck shall be void of moisture and all other debris.]

Where coal-tar pitch bitumen cannot be completely removed from the roof deck, mechanically attach a layer of thermal barrier to the roof deck as recommended or required by the manufacturer. Use manufacture’s required fastener and fastener density per deck type.

Notify the Owner if the existing deck is found deteriorated, decayed or deformed preventing proper installation or drainage of new system.

**installation of VAPOR RETARDER**

**[None required.]**

**[Vapor Retarder over Steel Deck and Concrete Deck NOT sealed at Perimeters or MEP Penetrations:** A minimum 6-mil vapor retarder shall be specified and required over the entire metal roof deck and be tape sealed at membrane lap, perimeter and all penetrations, on all new construction Project roofs, remodel Projects or mechanical equipment Projects penetrating the new or existing roof system and/or requiring roof replacement, where the interior of the building will be open to outside elements during construction or closed off from outside elements for protection to perform wet work and to provide heated areas at the interior under the new roof system. The vapor retarder will help prevent new construction moisture transfer into the new roof system insulation during interior Work.]

[**Vapor Retarder:** Minimum requirement: 6-mil Polyethylene sheeting lapped minimum 1’-0” and turned up at the perimeter and penetrations a minimum 4”. Provide “duct” tape type seal at all laps, perimeter and all penetrations.]

[**Vapor Retarder:** Membrane supplier’s approved self-adhered vapor retarder with a perm rating of .5 or less directly adhered to the [concrete] [thermal barrier mechanically attached to the steel roof deck. Thermal barrier shall be attached to the steel deck with a minimum of eight (8) fasteners per 4x8 board or manufacturer’s requirements, whichever is more conservative.]

[**Vapor Retarder:** Consisting of two (2) plies No. 15 organic felt set into full mopping of (minimum twenty five (25) pounds per square) of hot asphalt directly adhered to the [concrete] [thermal barrier mechanically attached to the steel roof deck. Thermal barrier shall be attached to the steel deck with a minimum of eight (8) fasteners per 4x8 board or manufacturer’s requirements, whichever is more conservative. *Note to Specifier: See DFD Master Roofing Specification 07 51 13 concerning placement of organic vapor retarder over substrate.]*

**INSTALLATION OF NEW ROOF SYSTEM**

Install all nailers and wood blocking in accordance with Section 06 10 53.

[**Abandoned Equipment Openings in Deck:** For hole size 3’ x 3’provide ¼” thick plate steel over opening. Plate shall bear minimum 4” beyond opening, laid in two (2) continuous beads of silicone sealant and mechanically fastened into concrete deck at 4 corners. Hole size over 3’ ’ x 3’ shall be structurally reviewed by the Owner and in-filled with material structurally compatible with existing deck. Owner shall provide the Contractor with detail(s) and/or written instructions to perform the Work.]

**[“New Construction Fully-Adhered Systems” Requiring Mechanical Fastening To Metal Deck:**

The first layer of insulation (Min. 1-1/2”) only shall be mechanically fastened over existing or specified vapor retarder, if required, over metal deck. Additional layers of insulation shall be fully-adhered over the first layer in membrane suppliers approved adhesives to encapsulate the mechanical fastener and its fastener plate. Metalic mechanical fastener plates are acceptable for use in the system. Plastic or other materials plates are not acceptable.

**[New Construction -“Cold Weather” Option, Installation of a Mechanically Fastened Roofing System:**

Prepare screw/plate/insulation to receive application of a minimum 6” x 6” piece of manufacturer peel-and-stick over each screw/plate mechanical fastener to entomb the application and aid in preventing direct condensation/moisture contact with the screw/plate. The goal would be to prevent future possible rusting of the plate at the screw head and failure of the roof system.]

[Repair all damage to vapor retarder before installation of first layer of insulation.]

[**Mechanical Fasteners:** Shall be sized to be long enough to fasten into the upper flute of the metal deck only, with a maximum 3/4" penetration unless membrane supplier requires additional penetration, in writing. No fasteners shall be installed that could be long enough to penetrate the lower flute of the metal deck. Fasteners installed that are longer than stated herein shall be cause for rejection of the Work, removal of such fasteners and repair of the metal deck, to the Owners satisfaction.]

[**Exposed to Interior Fasteners:** Shall be color coordinated to match the interior color of the metal deck and submitted for Owner review and written approval. Un-approved or incorrect colored fasteners shall be cause for rejection of the Work or be painted to match the color of the metal deck.]

Install insulation as follows:

[**Fully-adhered insulation over mechanically fastened insulation over metal deck:** Fasten first layer of insulation per manufacturer recommendations over existing or specified vapor retarder, if required, and adhere additional layers in solvent bases adhesives as recommended by membrane supplier. Metalic mechanical fastener plates are acceptable for use in the system. Plastic or other plates materials are not acceptable.]

[**Fully-adhered insulation over concrete deck:** Fully-adhere multiple layer(s) of insulation in low-rise and/or solvent based adhesives as recommended by membrane supplier.]

[**Ballast Roof System over Tapered Insulation:** Loose lay tapered insulation system in accordance with the approved shop drawings.]

[**Ballast Roof System over Structurally Sloped Deck:** Loose lay multiple layer(s) of insulation.]

Stagger insulation joints in all layers to include flat stock and tapered insulation, a minimum of 6" in both directions.

Install insulation boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeters of roof areas and around penetrations and projections.

**Provide:** Sumps around all roof drains using tapered insulation as required or detailed. Unless otherwise indicated, sump shall be 48” x 48”. Insulation shall have a constant, gradual slope from the perimeter of the sump to the drain bowl. Severely sloped sumps will be rejected.

**Provide New:** Clamping ring-to-bowl hardware (bolts, clamps, etc.). Tap out existing bolt holes prior to installation of new bolts. Replace broken or otherwise unusable clamping rings.

**Replace:** All broken or missing strainers with new cast iron strainers.

Complete installation of roof drain assembly on a daily basis. Temporary installation at drain bowl assemble shall not be allowed. Clamping rings and sealant shall be applied to assure a water tight installation at the end of each work day.

**Rod and Clean Drain:** When complete and roof is free of debris, Contractor shall rod and clean all drain bodies and piping to the first elbow to be clean and free of previous asphalt and coal tar system seepage, re-roofing debris and all other debris that may impede proper drainage.

All drains shall be made to be fully operable and free flowing and maintained in such condition throughout construction and after final drain bowl strainer re-installation.

Existing strainers are to receive two coats of non-fibrated aluma-coating or equal after final installation of roof system.

Install membrane in accordance with the membrane supplier’s recommendations and the following:

Use largest membrane panels practical to minimize field seams; where necessary, lap all seams in direction of flow.

Unroll membrane over the insulation and position without stretching. Allow to relax approximately 30 minutes or more, per membrane supplier’s instructions, prior to seaming.

Additional Counterflashing: Provide new like metal counterflashing per DFD detail at all existing roof top units and roof hatches where none exist, to cover and protect membrane termination, unless unit will be lifted allowing membrane to be placed up and over curb framing and secured at the interior surface of existing and new curb blocking.

**Termination Bar:** Restrain membrane at the roof perimeter, at higher walls and around all curbed and other penetrations base flashing using mechanically fastened continuous perimeter securement strip/metal termination bar, per manufacturer’s instructions.

Prior to seaming, thoroughly clean membrane of excess dirt, dust, talc, etc. Use manufacturer recommended cleaning agent. Scrub sheets with warm soapy water and rinse with clean water to insure clean surfaces.

**Primers and adhesives:** Mix all materials by stirring proper lengths of time as recommended by the membrane supplier. Consult membrane supplier’s literature for application techniques regarding use of rollers or brushes.

**Cold Weather Application:** Contact membrane supplier for written adhesive application temperature restrictions.

All field seams shall be minimum 3". Seams may be made using either adhesives or tapes. After seaming, roll seams with a 2" wide steel roller, using positive pressure. ROLL PERPENDICULAR TO SEAM ONLY.

Apply flashing to seal membrane to vertical elements, at all T-seams and at other appropriate locations in accordance with the manufacturer's recommendations and the following:

Cured flashing shall be used over the water-dam portion of the roof edge/fascia at all roof perimeters.

Uncured flashing shall be used on mechanical equipment curbs, other penetrations and T-seams. (Cured flashing may be substituted for uncured flashing where a minimum of 95% adhesion is obtained.)

Totally bond (95 to 100%) all flashing to its substrate and round all exposed corners.

Use a minimum 6” x 6" patch of uncured flashing over T-seams. (A T-seam is defined as two field seams which cross to form a "T".)

Forming of uncured flashing may be assisted with use of a hot air blower; take care not to overheat or "burn" material.

Thoroughly clean and apply sealant to all field fabricated seams in the membrane and flashing systems in accordance with the membrane suppliers detailed specifications. Sealant shall be applied at the end of each day.

Flash plumbing vents as detailed to provide a minimum height of 8" above the finished roof surface.

**Extend Standard Plumbing Vent Stacks:** Extend as necessary to provide a minimum height of 8" above the finished roof surface. No extensions used to achieve the minimum height shall be shorter than 4”. See DFD Standard Detail on DFD web-site for approved method.

**Concrete Pavers:** Install one (1) row of concrete pavers around all powered equipment, two (2) pavers at roof hatch exit, roof access doors, and at the top and bottom of all rooftop wall mounts ladders or stairways.Provide concrete pavers over a second layer of “protection” membrane, minimum 45-mil EPDM.

Existing clean EPDM roof membrane removed by the re-roofing Contractor may be acceptable for reuse under the concrete paver.

Standing water shall be diverted by use of saddles or cricket. Ponding water is defined as standing water on the surface of the roof membrane after 72 hours of reasonable drying weather, after a rain.

[Apply ballast in accordance with the membrane manufacturer’s recommendations and in compliance with ANSI/SPRI document RP-4, “Wind Design Standard for Ballasted Single-Ply Roofing Systems”.]

**CLEANING**

Inspect adjacent roof systems, their drain strainers and the grounds below the work area and remove debris associated with this project.

Repair or replace defaced or disfigured finishes caused by work in this Section. In areas where finished surfaces are soiled by asphalt or any other source soiling, caused by Work of this Section, consult with membrane supplier for cleaning advice, product recommendation and conform to their instructions.

\*\*\* END OF SECTION \*\*\*