#### SECTION 07 57 13.01

**FLUID-APPLIED 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 Moisture cured silicone fluid roof membrane with granules and Spray Polyurethane Foam (SPF) insulation on the substrate(s) specified and all associated roofing and metal flashing components.

PART 1 - GENERAL

 Scope

 Related Work

 Reference Standards

 Guarantee and Warranties

 Quality Assurance

 Product Delivery, Storage and Handling

 Submittals - Technical and Other Documents

 Submittals – Final Documents Required Upon Completion of the Work

 Site Conditions

PART 2 - PRODUCTS

 System Components

PART 3 - EXECUTION

 Examination

 Preparation for SPF

Installation of Spray Polyurethane Foam (SPF) Insulation

Installation of Coating System

 Job Completion

 Cleaning

RELATED WORK

Applicable provisions of Division 1 shall govern work under this Section. Contractor shall consult these provisions in detail prior to proceeding with work.

[06 10 53.01 – Miscellaneous Rough Carpentry - Roofing]

[07 63 00.01 –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 his material manufacturer in order to obtain guarantees, 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**

FM ‑ Roof Assembly Classifications.

NRCA ‑ Roofing and Waterproofing Manual.

UL ‑ Fire Hazard Classifications.

ASTM TEST METHOD PHYSICAL PROPERTY

ASTM C794 Adhesion-in-Peel

ASTM D 412 Tensile Strength

ASTM D 412 Elongation

ASTM C 661 Shore A Hardness (inst-5 sec.)

ASTM D 264 Die C Tear Resistance

ASTM D-1622 Nominal Density

ASTM D-1621 Compressive Strength Parallel

ASTM C-177 K-Factor Initial/Aged

ASTM C-177 R per inch Initial/Aged

ASTM D-1623 Tensile Strength

ASTM D-1940 Closed Cell Content

ASTM C-355 Moisture Permeation Rate

**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;

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 DFD and Agency bid document. When the state five (5) year guarantee has expired the membrane supplier shall be included in the bid documents to allow the Prime Contractor a larger pool of roofing Contractors to choose from and 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;

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, replacement and/or new roofing material installed into a portion of the existing roof system to seam in to the existing roof system membrane to achieve a watertight condition.

(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.)

**Note to Specifier:**

No- Dollar-Limit (NDL) and/or Total System Warranties system warranties are preferred. Where those system warranties are required, the manufacturer will require increase performance in the overall applications and at all terminations and provides a site inspection of the finished work prior to issuance of the warranties requested.

**Liquid Coating Manufacturer State of Wisconsin Guarantee:**  Provide written (NDL) no-dollar-limit guarantee warranting all roofing and flashing required under contract, to be watertight and free from defects in materials or workmanship for a period of **[ten (10)] [fifteen (15)] [twenty (20)] years** from date of installation, as stipulated in Liquid Coating Manufacturer’s State of Wisconsin Guarantee Form. A copy of the required guarantee form is appended hereto.

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

DFD is taking the quality of SPF roofs to a new level through the use of better termination details and installation requirements. It is the hope of DFD to assure the very highest quality possible and maintain a consistency of installation from any manufacturer or contractor.

This improvement in quality should result in reduced liability for the manufacturer. Final inspection for quality control is an important element in this. This requirement does not relieve the manufacturer from conducting periodic product and Contractor installation quality control inspections of their own prior to and throughout the term of the project. **Copies of all Manufacturer and Contractor inspection reports shall be sent to DFD on a timely basis.**

Final quality control independent inspection of finished project installation is required prior to issuance of the manufacturer warranty. Manufacturer or Contractor inspections will not be accepted. Inspection must be conducted by an independent inspector that has a certificate from  Spray Polyurethane Foam Alliance (SPFA) demonstrating they have completed and passed SPFA Accreditation Course 101 - I; Fundamentals of SPF Roofing for the Independent Inspector

Prior to inspection, contractor shall furnish the inspector a copy of this specification including exhibits and details, and the Daily Log required during installation. The report shall include photos of all installed details required in this specification. **Copies of the independent inspector reports shall be included with the state’s copy of Manufacturer’s warranty.**

Fees for this inspection, all written reports and sample testing shall be included in the manufacturer project costs by inclusion of such required costs in the purchase cost of the product sold to the Contractor. The manufacturer shall provide the services of the approved accredited independent inspector.

Note: Warranty does not contain clause(s) voiding warranty due to contractor solvency, improper workmanship, contractor error, or contractor failure to follow manufacturer specification(s) and requirements to obtain the warranty requested by this project.

**Note to Specifier:**

Send one (1) copy each (In PDF/scan format via e-mail) of all Contractor submitted and “signed” roof system State guarantees, manufacturer warranties, manufacturer metal guarantee and other guarantees associated with the roof system to the DFD Project Manager.

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 manufacturer 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 manufacturer NDL (“No-Dollar-Limit”)/”Total System” warranty specified herein.

Shop fabricated metal flashing materials as specified in section 07 63 00.01 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 manufacturer total system warranty specified.

**QUALITY ASSURANCE**

Refer to “Technical Documents and Other Submittal” 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:**

Roofing Contractor shall submit manufacturer’s current written documentation stating that they are an ”approved applicator” in good standing able to perform quality work on new construction projects, remodel projects including mechanical and electrical new work penetrations or abandonment of existing roof penetrations that require minor system repair, replacement and/or new material installed into a portion of the existing roof system with intension to seam in to the existing roof system membrane to achieve a watertight condition. This requirement shall apply to all work requiring submittal of a State Guarantees and/or manufacturer warranties.

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.

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.

All moisture cured silicone and SPF component containers required to complete the project shall be on site before the start of the project.

Containers shall be labeled to include Manufacture name, address, phone number, emergency spill and bodily contamination telephone numbers, batch number, batch container in-series numbering, container content, container volume, DFD project number, project name, project location, project address, Contractor name and phone number.

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

Provide such assistance as may be required by State representative(s) visiting site. Assistance required may include, but not limited to, taking samples of application, repair of sampled areas, access to project areas, presentation of documents listed in project related specification section(s).

Any SPF and coating applied to the existing U.L. classified roofing system shall retain the existing classification for the substrate(s) in this project.

Proof of U.L. classification shall be submitted to DFD upon request. The U.L. classification must identify the type of roof system tested, date of test, manufacture name, specific product and product identification number.

Manufacture’s using and/or supplying other manufacture U.L. classified products as supplements, or in blending multiple manufacture products shall acquire a U.L. classification rating specific to the altered, new products, for the specific roof system in this project and issued to the manufacture supplying the product.

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 State 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 the manufacturer's original, unopened containers and rolls with labels intact and legible.

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 all flammable products away from spark or open flame.

Store roofing materials at a minimum of 50°F prior to use or as otherwise recommended by the manufacturer. Protect materials from freezing. Protect materials from prolonged exposure to temperatures exceeding 95°F.

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 review and 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 the Following Test Results: Three (3) copies of the; Moisture cured silicone must be approved under ASTM 6694 D -07 or later.** **Copy of independent laboratory testing must be on file with DFD Project Manager and update copies submitted for each Project.**

**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.

**Submit:** Three (3) copies of the manufacture’s technical data sheet reported indicating R-value per inch.

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)

**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

Obtain asbestos tests as follows for installation of roof system materials over existing BUR moisture scanned roof systems.

**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 one (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.

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.

**Note to Specifier;**

Delete the following waste manifest requirement where BUR system or vapor retarder membranes 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)”.]

DAILY LOG

**Submit:** One (1) copy of ambient temperature during application, times of application(s), products applied with batch numbers and roof map indicating application areas each day.

AS-BUILT DRAWING

**Submit:** One (1) copy of a fully dimensioned 8-1/2” x 11” as-built roof plan showing all insulation removal and SPF insulation fill in locations.

STATE OF WISCONSIN ROOF GUARANTEE:

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

STATE OF WISCONSIN MANUFACTURER 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.

**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.

PART 2 - PRODUCTS

**SYSTEM Components**

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

Where specific manufacturers are named, products by other manufacturers may be considered equal in accordance with the provisions of Article 17 of the General Conditions.

Other manufacturer products shall meet all requirement of this specification section and must be review by DFD prior to bid submittal.

Product specification, warranty and other documentation as required to verify product qualification shall be submitted as requested by DFD.

Submitted bids unable to meet the requirements of prior submittal and/or the requirements of these specifications will be disqualified.

Use new materials only; salvaged or used materials are unacceptable.

**Pre-approved moisture cured silicone and SPF /Manufacturers:**

Gaco Western Inc.; West Development Group; Premium Spray Products; Progressive Materials LLC; Volatile Free Inc. (VFI) or equal. Manufacturers not listed herein must be approved by DFD prior to bid opening.

Manufacturer and products substitutions not listed within this specification shall be requested and approval receive from DFD Project Manager or Architectural Engineer, in writing, **prior to the bid opening.**

Coatings shall be U.L. Listed to retain existing system UL ratings when applied to roof as specified in this project.

**Moisture cured silicone must be approved under ASTM 6694 D -07 or later.**

**Copy of independent laboratory testing must be on file with DFD Project Manager.**

Performance Values include:

Physical Property ASTM Standard Requirement

Physical Property ATM Standard Requirement

Initial percent elongation D 2370 min 100 %

Initial tensile strength D 2370 min 1.03 MPa (maximum stress)/ (150 psi)

(break)after 5000 h

accelerated weathering(break)

Final percent elongation D 2370 min 100 %

Permeance E 96 Procedure B min 14.3 3 10-8 g/Pa·s·m2 /(2.5 U.S. Perms)

Accelerated weathering D 4798 No cracking or checking; maintain at least

5000 h 50 % of initial elongation

Adhesion to SPF D 903 Min 350 N/m/(2.0 pli) wet

Tear resistance D 624 Min 3.5 kN.m/(20 lb ft/in.)

Low-temperature D 522 Min pass 1.27 cm flexibility(1⁄2 in.) mandrel–26°C (–15°F)

Approved Spray Polyurethane Foam (SPF) used for thermal insulation.

Performance Values:

### PHYSICAL PROPERTY ASTM TEST METHOD TYPICAL VALUE

Density (nominal) ASTM D-1622 2.7 pcf

Compressive Strength (minimum)

(parallel to rise) ASTM D-1621 45 psi

K Factor (Initial) ASTM C-177 0.15 btu.in/ft2.hr. °F

Closed Cell Content ASTM D-1940 90%

Dimensional Stability

(Aged 28 days, % volume change) ASTM D-2126 <2.5 @ 158oF/98% RH

Moisture (Perm/Inch) ASTM C-355 0.8

Spread of Flame\*

(2 inch thick sample) ASTM E-84 <75 (Smoke <450)

Water-Based Epoxy Primer: A two-component, water-based, multi-purpose, easy spreading epoxy primer.

Urethane-based, low solids, fast drying, penetrating, rust and general-purpose primer.

Highly concentrated, low-sudsing biodegradable cleaner used to remove grease and grime.

[Pourable Sealer (if required): 2-part polyurethane sealer intended for use by the manufacturer to seal pitch pans and other penetrations.]

Other products, not specifically described, but required for a complete and proper installation of the work in this section shall be selected by the Contractor subject to the approval of the DFD Project Manager.

PART 3 - EXECUTION

**EXAMINATION**

Contractor shall examine substrate for conditions that might detrimentally affect the application and shall report all unsatisfactory conditions to Manufacturer and will not proceed until these conditions have been corrected.

It is the Contractor’s responsibility to isolate the area of work such that no overspray will settle onto the property of others associated or not associated with this project or the facility. The Contractor must notify the Facility if movable equipment or vehicle(s) must be relocated to prevent such over spray. Stationary equipment or other property at the work area shall be the Contractor’s responsibility to protect at all times.

The Contractor must isolate by fencing or other means, the Contractor’s setup/operations area.

Commencing work implies acceptance of existing conditions as satisfactory to the outcome of this work.

Air intake vents, blowers, air conditioning units and evaporative coolers shall be disconnected or otherwise modified to prevent fumes from entering into the building or from contaminating the roof surface with condensate water.

**PREPARATION FOR COATING**

Plan work and take whatever action is necessary to prevent dirt and debris from entering the building during [construction] [removal of existing roofing materials].

**Note to Specifier:**

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

**Note to Specifier:**

Select appropriate section(s) from below:

***[Bur w/Gravel:***

Replace deteriorated or structurally unsound decking.

Remove non imbedded gravel or slag surfacing materials using stiff-bristle brooms or mechanical sweeper and power vacuum as may be required. Hydro-vacuuming may be used as an alternate to the above.

**CAUTION:** Do not allow large amounts of material to accumulate and overload deck structure. Be sure all drains are clear and functioning.

Remove all imbedded gravel, excess asphalt, and loose membrane within 2” of edge termination.

Replace deteriorated or structurally unsound decking.

Cut-out blisters, ruptures, soft spots, and other deteriorated areas and repair with approved polyurethane foam to elevation of existing roof.

Remove wet roofing and insulation and repair with approved polyurethane foam to elevation of existing roof.

Comply with manufacturer's published instructions for preparation of substrates to receive approved polyurethane foam. Clean substrate of dust, debris, and other substances detrimental to roofing work.

Areas of excessive amounts of cold applied materials shall be removed down to felts.

Prime per manufacturers recommendations.

Eliminate areas of ponding using approved polyurethane foam.]

***[Bur Smooth:***

Replace deteriorated or structurally unsound decking.

Remove all excess asphalt and loose membrane within 2” of edge termination.

Cut-out blisters, ruptures, soft spots, and other deteriorated areas and repair with approved polyurethane foam to elevation of existing roof.

Remove wet roofing and insulation and repair with approved polyurethane foam to elevation of existing roof.

Comply with manufacturer's published instructions for preparation of substrates to receive approved polyurethane foam. Clean substrate of dust, debris, and other substances detrimental to roofing work.

Areas of excessive amounts of cold applied materials shall be removed down to felts.

Prime per manufacturers recommendations.

Eliminate areas of ponding using approved polyurethane foam.]

***[Pre-engineered Metal:***

Sweep or blow dirt and dust from roof surface. Power wash roof with liquid detergent and rinse thoroughly with clean water.

Use concentrated chlorine solution to treat areas of mildew, fungus or algae.

Remove all loose coating back to well adhered area.

Remove and prime all excess rust and scale.

Remove areas of ponding to substrate, prime, and neatly replace with approved spray foam to assure adequate drainage.

Inspect all flashings and terminations and repair to requirements for warranty issuance.

Repair all surface damage.

Allow roof to dry completely before proceeding with application.

Prime per manufacturers recommendations, including but not limited to, rust.]

***[New Construction Lightweight Concrete:***

Acceptable lightweight concrete decks for use with the applicable approved fasteners are:

1. Cementitious Wood Fiber and Gypsum use fasteners with a minimum pullout of 225 pounds per fastener for cementitious wood fiber or 300 pounds per fastener for gypsum.
2. Lightweight Insulating Concrete use fasteners with a minimum pullout of 300 pounds per fastener.

Fiber board or gypsum board underlayments will be ½ inch minimum thickness and will meet ASTM C-208-72 and will be of the "Sheathing, Regular Density" type, often termed ("high density roof insulation”). ISO-board underlayments will be 1 inch minimum thickness. When using underlayment great care should be taken to insure it is not contaminated with water in any form.

Special care must be taken to protect underlayment materials from moisture or other contaminants.

Moisture contamination will seriously affect the quality of the spray foam applied over contaminated underlayment.

Upon receipt at job site underlayment should be unwrapped, inspected, and stored in a dry protected area and on clean, raised platforms with securely anchored weather protective covering.

The underlayment must be mechanically fastened in accordance with Factory Mutual or System Manufacturer’s wind uplift requirements.

Underlayment shall be installed in a staggered pattern with joints butted together without gaps or openings.

Joints gaps exceeding ¼” shall be caulked or taped with suitable material.

Underlayment installation shall be limited to that which can be foamed to full thickness in one day.

Prime underlayment per manufacturer’s recommendations.

When foaming directly to light weight concrete deck:

1. Concrete should be completely cured and dry.
2. Remove curing compounds if present, by etching with 10% muriatic acid and brooming, followed by clean water rinse. Allow to thoroughly dry before applying priming.
3. Remove all dust or powder from surface.
4. Prime per manufacturer’s recommendations.]

***[New Construction Metal Deck:***

Acceptable steel decks for use with the applicable approved fasteners are:

1. 22 gauge steel or heavier use fasteners with a minimum pullout of 425 pounds per fastener.

Fiber board or gypsum board underlayments will be ½ inch minimum thickness and will meet ASTM C-208-72 and will be of the "Sheathing, Regular Density" type, often termed ("high density roof insulation”).

ISO-board underlayments will be 1 inch minimum thickness. When using underlayment great care should be taken to insure it is not contaminated with water in any form.

Special care must be taken to protect underlayment materials from moisture or other contaminants.

Moisture contamination will seriously affect the quality of the spray foam applied over contaminated underlayment.

Upon receipt at job site underlayment should be unwrapped, inspected, and stored in a dry protected area and on clean, raised platforms with securely anchored weather protective covering.

All metal joints should be correctly lapped, sealed, and fastened in accordance with System Manufacturer’s recommendations.

The underlayment must be mechanically fastened in accordance with Factory Mutual or System Manufacturer’s wind uplift requirements.

Underlayment shall be installed in a staggered pattern with joints butted together without gaps or openings.

Joints gaps exceeding ¼” shall be caulked or taped with suitable material.

Underlayment installation shall be limited to that which can be foamed to full thickness in one day.

Prime underlayment per manufacturer’s recommendations.]

***[New Construction Structural Concrete:***

When foaming directly to structural weight concrete deck:

1. Concrete should be completely cured and dry.
2. Remove curing compounds if present, by etching with 10% muriatic acid and brooming, followed by clean water rinse. Allow to thoroughly dry before applying priming.
3. Remove all dust or powder from surface.
4. Prime per manufacturer’s recommendation.

Acceptable structural concrete deck for use with the applicable approved fasteners is:

Concrete rated 3,000 psi or greater use fasteners with a minimum pullout of 800 pounds per fastener.

Fiber board or gypsum board underlayments will be ½ inch minimum thickness and will meet ASTM C-208-72 and will be of the "Sheathing, Regular Density" type, often termed ("high density roof insulation”). ISO-board underlayments will be 1 inch minimum thickness.

Wet underlayment shall be removed from the site.

Special care must be taken to protect underlayment materials from moisture or other contaminants.

Moisture contamination will seriously affect the quality of the spray foam applied over contaminated underlayment.

Upon receipt at job site underlayment should be unwrapped, inspected, and stored in a dry protected area and on clean, raised platforms with securely anchored weather protective covering.

All metal joints should be correctly lapped, sealed, and fastened in accordance with System Manufacturer’s recommendations.

The underlayment must be mechanically fastened in accordance with Factory Mutual or System Manufacturer’s wind uplift requirements.

Underlayment shall be installed in a staggered pattern with joints butted together without gaps or openings.

Joints gaps exceeding ¼” shall be caulked or taped with suitable material.

Underlayment installation shall be limited to that which can be foamed to full thickness in one day.

Prime underlayment per manufacturer’s recommendations.]

***[Single-ply:***

Remove ballast materials using stiff-bristle brooms or mechanical sweeper and power vacuum as may be required.

Hydro vacuuming may be used as an alternate to the above.

CAUTION: Do not allow large amounts of material to accumulate and overload deck structure.

Clean substrate of dust, debris, and other substances detrimental to roofing work.

Remove membrane from perimeter of field and flashings.

Remove wet roofing and insulation and repair with approved insulation to elevation of existing roof.

Mechanically fasten recovery board over entire surface of roof.

Acceptable steel decks for use with the applicable approved fasteners shall be 22 gauge or heavier. Use fasteners with a minimum pullout of 425 pounds per fastener.

Fiber board or gypsum board recovery board will be ½ inch minimum thickness and will meet ASTM C-208-72 and will be of the "Sheathing, Regular Density" type, often termed ("high density roof insulation”).

ISO-Board recovery board will be 1-inch minimum thickness. When using recovery board great care should be taken to insure it is not contaminated with water in any form.

Special care must be taken to protect recovery board materials from moisture or other contaminants.

Moisture contamination will seriously affect the quality of the spray foam applied over contaminated recovery board.

Upon receipt at job site recovery board should be unwrapped, inspected, and stored in a dry protected area and on clean, raised platforms with securely anchored weather protective covering.

All metal joints should be correctly lapped, sealed, and fastened in accordance with System Manufacturer’s recommendations.

The recovery board must be mechanically fastened in accordance with Factory Mutual or System Manufacturer’s wind uplift requirements.

Recovery board shall be installed in a staggered pattern with joints butted together without gaps or openings.

Joints gaps exceeding ¼” shall be caulked or taped with suitable material.

Recovery board installation shall be limited to that which can be foamed to full thickness in one day.

Prime underlayment per manufacturer’s recommendations.]

**INSTALLATION OF SPRAY POLYURETHANE FOAM (SPF) INSULATION**

**CAUTION**: Care must be taken in applying silicone coatings near tie-in lines. Silicone can inhibit foam or primer adhesion and lead to delamination.

**Note to Specifier:**

Insert R-value minimum average required.

Installed spray polyurethane foam (SPF) average thickness shall meet an average **[R-00]** (***Contractor :*** R-value, thickness to be determined by manufacture’s technical data sheet reported R-value.)  SPF minimum average thickness shall be 1.5 inches over BUR/ Gravel substrates and 1.25 inches over all other substrates regardless of R-value required above. All SPF terminated neatly at designated places.  Turn up at all vertical surfaces a minimum of 3" or 2½ times the minimum foam thickness.

Contractor shall submit manufacture published insulation R-value data. See submittals required.

Foam shall be applied by use of “robotic” application equipment. Manual application will not be acceptable except at terminations and penetrations, or where safety or structural limitation prevents the use of the equipment required for a robotic application and it is considered impractical.

Foam lift applications of less than ½" thickness are not acceptable.

Mask areas where SPF is to be terminated to prevent surface contamination with SPF over spray.

SPF spray application shall be limited to that which can be completed to full SPF thickness in one day. All exposed SPF tie-in end laps and side laps must be primed at the end of each workday.

The completed SPF surface shall be smooth to orange peel texture; popcorn texture is not acceptable.

The completed SPF surface shall be free of pinholes and/or "glass windows" caused by improper equipment calibration or climatic conditions. The SPF shall not have any soft or spongy areas or areas with hard or brittle strings of improperly proportioned material

Eliminate areas of ponding using approved SPF to create positive drainage.

Remove protective masking at terminations.

Apply protective coating to SPF surface on the same day as SPF is installed.

When unexpected or unusual conditions occur and SPF is not completed to full thickness in one day and/or SPF is left exposed, unprimed, or uncoated overnight, consult manufacturer for written recommendations specific to this job and occurrence. Note areas and date on roof drawing and include with a copy of manufacturer’s written recommendations specific to that occurrence, and written report stating reason for delay, attach all to Daily Log.

**INSTALLATION OF COATING SYSTEM**

General:

**CAUTION**: Care must be taken in applying silicone coatings near tie-in lines. Silicone can inhibit foam or primer adhesion and lead to delamination.

Do not apply coating when moisture is present on the substrate.

Wind barriers shall be used if wind conditions could affect the quality of the material being applied.

Coating must cover all surfaces completely. An extra pass of coating material may be required at all edges and penetrations.

Base coat(s) and primer(s) shall be allowed to cure before proceeding with subsequent applications.

All coating and primers shall be coated within recommended time period. If application is delayed beyond that time, consult Manufacturer for primer recommendations.

No traffic shall be permitted on the coated roof surface for a minimum of 3 days. Damage to the surface by other trades shall not be the responsibility of the roofing contractor.

Application Thickness:

**(15 YEAR NDL SYSTEM)**

[Minimum Application Thickness: Base coat and intermediate coat total thickness shall be minimum 25 TDM (Total Dry Mils) or per Manufacturer’s warranty requirement, whichever is greater.]

**(20 YEAR NDL SYSTEM)**

[Minimum Application Thickness: Base coat and intermediate coat total thickness shall be minimum 30 TDM (Total Dry Mils) or per Manufacturer’s warranty requirement, whichever is greater.]

Application rates must be checked periodically to assure proper coating thickness. This may be done with a wet film gauge or by checking coverage of a known quantity. (i.e. 5 gallons covers 333 sq. ft. (4’x83’) or. 7 ½ gallons covered 500 sq. ft. (Both examples = 1 ½ gallons per square.)

Each contactor should estimate coating requirements based on actual experience and needs to figure losses due to applicator experience, surface texture, wind, waste, and other factors increasing estimated gallons required.

The minimum dry mil thickness of all coatings, as well as the minimum dry mil thickness of the topcoat(s) shall meet the minimums required by Manufacturer for the warranty period.

**Application of approved moisture cured silicone coating:**

Apply base coat to the minimum thickness required. Double coat flashing and edge termination including expansion joint covers, parapets and flashing.

Apply intermediate coat of contrasting color to the minimum thickness required. The intermediate coat shall completely cover the base coat.

Base coat and intermediate coat must cover all surfaces completely extending at least 2" beyond foam on vertical terminations. An extra pass of base coat material is required at all edges and penetrations.

Contractor needs to figure losses due to over spray, foam texture and wind increasing estimated gallonage required.

Apply top coat of contrasting color to the minimum thickness required to embed granules. The final color shall be approved by DFS Project Manager.

Broadcast 3M #10 or equal granules to refusal into wet topcoat to fully cover vertical surfaces. (Minimum rate of approximately 40 lbs per 100 sq. ft.)

The top coat(s) shall completely cover the base coat(s) including expansion joint covers, parapets and flashing.

All coatings shall be allowed to cure the minimum required by manufacturer before proceeding with subsequent coating applications. Refer to “Application”section of Technical Data Bulletins for application instructions.

Application rates must be checked periodically to assure proper coating thickness. This may be done with a wet film gauge or by checking coverage of a known quantity. (i.e. 5 gallons covers 333 sq. ft. (4’x83’) or. 7 ½ gallons covered 500 sq. ft. (Both examples = 1 ½ gallons per square.)

Remove excess non-adhered granules to prevent wash-off to drains on downspouts.

Provide additional metal counterflashing per DFD detail at all existing mechanical, electrical, plumbing, skylight and roof hatch curbs where none exist.

Complete installation of roof drains on a daily basis (membrane and lead shall extend under the clamping ring). Provide new clamping ring-to-bowl hardware (bolts, clamps, etc.). Replace broken or otherwise unusable clamping rings. Replace broken or missing strainers with new cast iron strainers.

Temporary installation at drain bowl assemble shall not be allowed. Clamping rings and sealant shall be applied to assure a water tight installation.

Contractor shall rod and clean all drain bodies and piping to be clean and free of previous asphalt and coal tar system seepage 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.

Drain strainers shall be cleaned and prepared to receive fluid-coating(s) as required for roof system.

[Mechanical venting/exhaust hoods, plumbing and electrical penetrations/piping shall be cleaned and prepared to receive fluid-coating(s) as required for roof system.]

Refasten all mechanical equipment and remount other rooftop equipment as necessary.

Ponding water is defined as standing water on the surface of the roof membrane after 72 hours of reasonable drying weather, after a rain.

[Refill pitch pockets with pourable sealer. Fill in minimum of two (2) lifts. Shape final lift to shed water.]

**JOB COMPLETION**

Inspect completed roofing system and correct all defects to meet the specification and/or warranty requirements including a visual inspection for:

Transparent or thin areas: if areas appear to be undercoated, recoating may be needed to ensure final thickness to meet the Manufacturer’s specifications.

Delamination- Verify that all coated areas appear to be fully adhered to the substrate. A visual inspection looking for typical signs of poor adhesion such as flaking, blistering etc. should be made. Re-priming and/or recoating will be required if such areas are apparent.

Pin Holing- Certain job or site conditions may result in pin holing or out gassing during curing or pin holes in the substrate. Again, a visual inspection looking for typical signs of out gassing such as excessive pockmarks, pinholes etc. should be done.

Manufacturer representative shall also inspect the completed roofing system and notify the Contractor and DFS Project Manager of any defects in the application.

Restrict construction traffic and equipment movement on the completed roofing system to only essential personnel.

Provide appropriate protection against traffic and construction activities on completed roofs.

Damage to the roof by other trades shall not be the responsibility of the Manufacturer Roofing Applicator.

**CLEANING**

Repair or replace defaced or disfigured finishes caused by work of this Section. In areas where finished surfaces are soiled by application of the moisture cured silicone and SPF or any other source of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.

Over spray shall be completely removed from all areas to DFD satisfaction and surrounding area original conditions.

Over spray found on movable equipment and other property of those associated or not associated with the Facility, State or this project shall be removed and cleaned such that the property is brought back to its original condition.

Clean up all debris, excess materials, and equipment and remove from site.

All claims of this nature must be satisfied prior to final payment.

Contractor shall rod and clean all drain bodies and piping to be clean and free of previous asphalt and coal tar system seepage. All drains shall be fully operable and free flowing.

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