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SPEC NOTE: **HRS (Henry Restoration System) Henry Permax 3.0 Spray Polyurethane Foam and Henry Pro-Grade® 285 or Pro-Grade® 285 Fast Set Acrylic Roof Coating for Existing MB/BUR Roofs.** This specification is ideally suited for the protection and maintenance of existing granulated or smooth surfaced modified bitumen (MB) or smooth surfaced asphalt built-up roofing (BUR) to extend the life of the roofing assembly. Although prepared in CSI three (3) part format, this specification should be adapted to suit the requirements of the individual project and be included as a separate section under Division 07 - Thermal and Moisture Protection.

SPEC NOTE: This document is intended as a reference for the recommended installation procedures of the products/assembly described below. Although this specification section follows the recommendations of the Construction Specifications Institute (CSI), Manual of Practice including MasterFormat, SectionFormat, and PageFormat; It is the discretion of the project specification author to use the information within as a whole, or in part, to set a minimum standard of performance for specified products/assembly on a project specific basis. Areas noted “[project specific]” are intentionally omitted and shall be updated and coordinated by the project specification author.

SPEC NOTE: This document includes Henry notes for information purposes and to assist the architect/specification writer in making appropriate decisions. A Henry “SPEC NOTE” will always immediately precede the text to which it is referring. The section serves as a guideline only and should be edited with deletions and additions to meet specific project requirements.

SPEC NOTE: Delete “SPEC NOTE” sections in the final copy of the specification.

SPEC NOTE: This specification is not intended for application over coal tar roofs, single-ply, silicone coatings, or roofs previously covered with loose or embedded gravel ballast.

SPEC NOTE: Use extreme caution when applying and walking on coated surfaces. Coated surfaces are extremely slippery and can create a fall hazard resulting in injury or death.

SPEC NOTE: Coverage rates indicated in guide specifications DO NOT include material calculations for waste..

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**SECTION 07 01 50**

**COATED FOAMED ROOFING**

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SPEC NOTE: This guide specification has been written in accordance with the Construction Specifications Institute (CSI) Manual of Practice and use of General Contractor/installing Subcontractor identified accordingly. Modify Sections as required for projects where no General Contractor is allocated.

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**GENERAL**

* 1. GENERAL REQUIREMENTS
		1. The General Conditions, Supplementary Conditions, Instructions to Bidders, and Division 01- General Requirements shall be read in conjunction with and govern this section.
		2. The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the installing Subcontractor the extent of their Work.
	2. SUMMARY
		1. This Section includes requirements for supplying labor, materials, tools, and equipment to complete the Work as shown on the Drawings Architectural Division as specified herein including, but not limited to, the following:
			1. Spray Polyurethane Foam Primer
			2. Spray Polyurethane Foam
			3. Sealant
			4. Roof Coating
			5. Roof Granules (optional)
			6. Walkways (optional)

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SPEC NOTE: Edit Paragraph below to suit project requirements: Add Sections as applicable.

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* 1. RELATED REQUIREMENTS

* + 1. DIVISION 07 – Thermal and Moisture Protection Section 07 01 20 – Maintenance of Thermal Protection
		2. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.13 – Roof Moisture Survey
		3. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.16 – Roof Maintenance Program
		4. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.19 – Preparation for Re-Roofing
		5. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.23 – Roof Removal
		6. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.81 – Roof Replacement
		7. DIVISION 07 – Thermal and Moisture Protection Section 07 01 50.91 – Roofing Restoration
		8. DIVISION 07 – Thermal and Moisture Protection Section 07 01 60 – Maintenance of Flashing and Sheet Metal
		9. DIVISION 07 – Thermal and Moisture Protection Section 07 01 90 – Maintenance of Joint Protection

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SPEC NOTE: Projects not referencing LEED delete Sections “1.03. J” and “1.05.E” as stated below.

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* + 1. DIVISION [project specific] - LEED Requirements Section [project specific] – [project specific].
	1. ALTERNATES
		1. Submit requests for alternates in accordance with Section [project specific].
		2. Materials must meet the following criteria:
			1. Spray polyurethane foam:
				1. Densities less than 2.8 nominal density in accordance with ASTM D1622
			2. Roof coatings:
				1. UL approved as a component within Class “A” and “B” fire rated roof coverings.
		3. Alternate submission format to include:
			1. Online certification listings:
				1. FM Approval
				2. UL Approval
			2. Evidence that alternate materials meet or exceed performance characteristics of product requirements and documentation from an approved independent testing laboratory certifying that the performance of the system including auxiliary components exceed the requirements of the local building code.
			3. Product Data:
				1. Spray Foam and Roof Coating Manufacturer’s guide specification.
				2. Spray Foam and Roof Coating Manufacturer’s complete set of technical data sheets for assembly.
				3. Energy Star listing.
			4. Certificates:
				1. Product certification that the assembly components are supplied and warranted by single source Spray Foam and Roof Coating Manufacturer.
				2. Statement that installing Subcontractor is authorized by Spray Foam and Roof Coating Manufacturer to complete Work as specified.
				3. LEED:

Health Declaration Product (HPD) Certificate

* + - 1. Warranty:
				1. Complete set of warranty verification documents as required by the Spray Foam and Roof Coating Manufacturer.
			2. References clearly indicating that the Spray Foam and Roof Coating Manufacturer have successfully completed projects of similar scope and nature on an annual basis for a minimum of ten (10) years.
		1. Submit requests for alternates to this specification a minimum of ten (10) working days prior to bid date. Include a list of twenty-five (25) projects executed over the past five (5) years.
		2. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.
	1. REFERENCES
		1. American Society for Testing and Materials (ASTM):
			1. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
			2. ASTM C794: Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
			3. ASTM C1549: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
			4. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
			5. ASTM D1623 Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
			6. ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
			7. ASTM D2240 Standard Test Method for Rubber Property-Durometer Hardness.
			8. ASTM D2369 Standard Test Method for Volatile Content of Coatings.
			9. ASTM D471: Water Absorption
			10. ASTM D4799 Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Fluorescent, UV, Water Spray, and Condensation Method).
			11. ASTM D6694: Specification for Liquid Applied Silicone Coating Used in Spray Polyurethane Foam Roof Systems.
			12. ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings.
			13. ASTM E2178 Standard Test Method for Air Permeance of Building Materials.
			14. ASTM E96: Water Vapor Transmission of Materials
			15. ASTM E1980: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces Miami-Dade County Product Control NOA (Notice of Acceptance)
		2. Factory Mutual (FM):
			1. Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction
		3. International Code Council Evaluation Service (ICC-ES): Coated Foam Roofing
		4. Underwriters Laboratories (UL):
			1. UL Inc.: Class A Classification for use in roof coverings
		5. US Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED)
	2. ADMINISTRATIVE REQUIREMENTS
		1. Pre-installation meetings:
			1. When required, and with prior notice, a Spray Foam and Roof Coating Manufacturer representative will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the assembly.
	3. SUBMITTALS
		1. Provide the following requested information in accordance with Section [project specific] Submittal Procedures.
		2. Action Submittals:
			1. Product Data:
				1. Spray Foam and Roof Coating Manufacturer’s guide specification.
				2. Spray Foam and Roof Coating Manufacturer’s complete set of technical data sheets.
				3. Spray Foam and Roof Coating Manufacturer’s complete set of guide detail drawings.
				4. LEED: Spray Foam and Roof Coating Manufacturer’s HPD or product certificate
				5. Energy Star listing.
			2. Certificates:
				1. Product certification that the assembly components are supplied and warranted by single source Spray Foam and Roof Coating Manufacturer.
				2. Statement that installing Subcontractor is authorized by Spray Foam and Roof Coating Manufacturer to complete Work as specified.
				3. Statement that installing Subcontractor is Spray Polyurethane Foam Alliance (SPFA) qualified applicator.
			3. Warranty:
				1. Complete set of warranty verification documents as required by the Spray Foam and Roof Coating Manufacturer.
	4. QUALITY ASSURANCE
		1. Single Source Responsibility:
			1. Obtain spray polyurethane foam and roof coating and auxiliary materials including primers, primary roof coating, fabric reinforcement, sealants, and adhesives from a single Spray Foam and Roof Coating Manufacturer regularly engaged in the manufacturing and supply of the specified products.
			2. Installing Subcontractor to verify product compliance with federal, state, and local regulations controlling use of Volatile Organic Compounds (VOC).
		2. Manufacturer Qualifications:
			1. Spray Foam and Roof Coating Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
				1. Spray Foam and Roof Coating Manufacturer must not issue warranties for terms longer than they have been manufacturing and supplying specified products for similar scope of Work.
		3. Installer Qualifications:
			1. Installing Subcontractor must be authorized to install Manufacturer’s spray polyurethane foam and roof coating.
			2. Perform Work in accordance with the Spray Foam and Roof Coating Manufacturer’s published literature and as specified in this section.
			3. Maintain one (1) copy of the Spray Foam and Roof Coating Manufacturer’s instructions on site.
			4. At all times during the execution of the Work allow access to site by the Spray Foam and Roof Coating Manufacturer representative.
			5. If meeting with the Spray Foam and Roof Coating Manufacturer during project construction, contact the Spray Foam and Roof Coating Manufacturer a minimum of two weeks prior to schedule meeting.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Delivery of Materials:
			1. Materials shall be delivered to the jobsite in undamaged and clearly marked containers indicating the name of the Spray Foam and Roof Coating Manufacturer and product.
		2. Storage of Materials:
			1. Store materials as recommended by the Spray Foam and Roof Coating Manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including, but not limited to, MSDS sheets, Product Data sheets, product labels, and specific instructions for personal protection.
			2. Keep solvents away from open flame or excessive heat.
			3. Spray polyurethane foam and roof coating should be stored in closed containers.
			4. Refer to Spray Foam and Roof Coating Manufacturer’s published literature.
		3. Handling:
			1. Provide adequate ventilation for protection from hazardous fumes.
			2. Protect areas not included in scope of work from overspray.
			3. Refer to Spray Foam and Roof Coating Manufacturer’s published literature.
			4. Verify material onsite is applied within allowable shelf life.
	6. SITE CONDITIONS
		1. Environmental Requirements:
			1. No Work shall be performed during rain or inclement weather.
			2. No Work shall be performed on frost covered or wet surfaces.
		2. Protection:
			1. It is the responsibility of the installing Subcontractor to protect all surfaces not included in scope of Work from overspray including, but not limited to, windows, doors, adjacent areas, and vehicles.
			2. Protective coverings shall be secured against wind and shall be vented if used in conjunction with applications preventing collection and moisture.
			3. Installing Subcontractor to post signs noting potential overspray hazard within 400ft (122 M) of applications.
			4. All air intake ventilation equipment shall be turned off to prevent fumes from entering building.
			5. No smoking signs must be posted as mandated by local fire ordinances.
		3. Ensure all preparation Work is completed prior to installing roof coating and spray polyurethane foam.
		4. All equipment shall be grounded during operations.
	7. WARRANTY
		1. Warranty Submittals to Spray Foam and Roof Coating Manufacturer:
			1. Contact Henry sales representative for a complete list of required documents and procedures prior to material purchase. Warranties submitted without required documents and procedures completed may result in delay or rejection of warranty request.

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SPEC NOTE: Contact the local Henry representative to obtain a current sample warranty for further clarification.

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* + 1. Warranty Terms:
			1. Installing Contractor:
				1. Installing Subcontractor must warranty the installation; provide material and labor costs for repair in the event of a leak as a result of faulty workmanship for a period of two (2) years from the date of installation completion.
			2. Manufacturer's Single Source Warranty; choose from the following:
				1. Warranty terms are based on cured roof coating thickness.

Refer to Section “3.03 H Application of Roof Coating”

* + - * 1. Manufacturer’s Single Source Material Plus Warranty:

Installing Subcontractor must be a Material Plus Authorized Subcontractor.

Manufacturer must warranty the products; provide material and labor costs for repair for a period of [10 years] [15 years] [20 years] years from the date of installation completion as a result of any of the following:

Manufacturing product defect

* + - * 1. Manufacturer’s Single Source Gold Seal Warranty:

Installing Subcontractor must be a Gold Seal Authorized Subcontractor.

Manufacturer must warranty the products and installation; provide material and labor costs for repair for a period of [10 years] [15 years] [20 years] years from the date of installation completion as a result of any of the following:

Manufacturing product defect

Faulty workmanship

1. **PRODUCTS**
	1. MANUFACTURERS
		1. Spray polyurethane foam, roof coating, and auxiliary materials must be obtained as a single-source from the Spray Foam and Roof Coating Manufacturer to ensure total system compatibility and integrity.
		2. Acceptable Manufacturers:
			1. Henry Company

999 N. Sepulveda Blvd. Suite 800

El Segundo, CA 90245

(800) 486-1278

[www.henry.com](http://www.henry.com)

* 1. MATERIALS
		1. Spray polyurethane foam and roof coating assembly shall comply with the following system requirements:
			1. FM Assembly Properties:
				1. Roof System: Liquid Applied System
				2. Application: Re-Cover
				3. Cover Securement: none
				4. Deck Type: Existing Roof
				5. Slope: 1.0
				6. Windstorm Classification: [90, 180, 270]
				7. Internal Fire Classification: [1, NC]
				8. External Fire Classification: A
				9. Hail-Resistance Classification: [MH, SH]
			2. Spray polyurethane foam:
				1. Thermal Resistance Value (R-value): Minimum project specific
			3. Primary roof coating:
				1. Energy Performance:

Initial Solar Reflectance (ASTM C1549): 88%

Solar Reflective Index (SRI): 111

ENERGY STAR: Certified

* + - * 1. Tested Fire Response Characteristics:

Standard Test Methods for Fire Tests of Roof Coverings (ASTM E 108 or UL 790): Class A

* + 1. Primary Products: (Basis of Design):
			1. Spray Polyurethane Foam:
				1. Two (2) component spray polyurethane foam; roof system, having the following properties:

Basis of design: Permax 3.0

Nominal Density (ASTM D1622): 3.0 lbs/ft³

Compressive Strength (ASTM 1621): 45-50 psi

Closed Cell Content: 90% minimum

Aged Thermal Performance:

K Factor (ASTM C518): 0.145

Tensile Strength (ASTM D1623): 70 psi

Water Vapor Transmission (ASTM C355): 1.9 perms

Water Absorption (ASTM D2842): 0.017 gm/cc

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SPEC NOTE: Contact Henry for additional roof coating color options.

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* + - 1. Roof Coating:
				1. Water based acrylic latex elastomeric roof coating; having the following properties:

Basis of design: Pro-Grade® 285 Acrylic Elastomeric Coating

Color: White

Elongation (ASTM D2370):

Initial: >240%

After 1000 hr. aging: >155%

Fungi Resistance Rating (ASTM G-21): 0

Volatile Organic Content (VOC) (ASTM D3960/EPA Method 24): 50 g/l max

Solar Reflective Index (SRI) (ASTM E1980): 109

Solar Reflectance (ASTM C-1549):

Initial: 0.86

Three (3) years: 0.69

Solids Content by Volume: >58-62%

Tear Resistance (ASTM D624): > 80 lbf/in

Tensile Strength Film (Initial) (ASTM D2370): >270 psi

Thermal Emittance (ASTM C1549):

Initial: 0.90

Three (3) years: 0.91

Water Vapor Permeance (ASTM E96): <50 perms

* + - * 1. Fast setting water based acrylic latex elastomeric roof coating; having the following properties:

Basis of design: Pro-Grade® 285 Fast Set Acrylic Elastomeric Coating

Color: White

Elongation (ASTM D2370):

Initial: >245%

After 1000 hr. aging: >230%

Fungi Resistance Rating (ASTM G-21): 0

Volatile Organic Content (VOC) (ASTM D3960/EPA Method 24): 50 g/l max

Solar Reflective Index (SRI) (ASTM E1980): 100

Solar Reflectance (ASTM C-1549):

Initial: 0.81

Solids Content by Volume: >58-62%

Tear Resistance (ASTM D624): > 80 lbf/in

Tensile Strength Film (Initial) (ASTM D2370): >390 psi

Thermal Emittance (ASTM C1549):

Initial: 0.90

Water Vapor Permeance (ASTM E96): <50 perms

* + 1. Assembly Auxiliary Materials:
			1. Spray Polyurethane Foam Primer:
				1. Contact Spray Foam and Roof Coating Manufacturer for a complete list of recommended primers.
			2. Sealants:
				1. Roofing Sealant:

Elastomeric acrylic patching compound specially formulated for repairing and preventing roof leaks prior to coating with an acrylic reflective coating; having the following physical properties:

Basis of Design Product: 289 White Roofing Sealant

ASTM C920, Class 25.

Elastomeric polymer latex compound; having the following properties:

Basis of design: 513 Elasto Flashing Compound

Color: White

Solids:

By Volume: 78.2%

By Weight: 68%

Flash Point (ASTM D3278): >212 degrees F

Tensile Strength Film - Initial (ASTM D2370): 282.2 psi

Volatile Organic Content (VOC) (ASTM D3960/EPA Method 24): 100 g/L

Maximum VOS: 0.83 lbs/gal

* + - 1. Roof Granules:
				1. Ceramic coated roof granules, and having the following properties:

Basis of design: Permax Roof Granules

Color: White

Sieve Size: varies; refer to Spray Foam and Roof Coating Manufacturer published literature

* + 1. Additional Materials:
			1. Cleaner:
				1. Refer to Section 3.02. D. Surface Cleaning
			2. Edge Metal Primer:
				1. Contact Spray Foam and Roof Coating Manufacturer for a complete list of recommended products.
			3. Walkways (optional):
				1. 20-40 mesh silica sand or quartz
1. **EXECUTION**
	1. EXAMINATION
		1. The installing Subcontractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with the Spray Foam and Roof Coating Manufacturer’s published literature. Commencement of Work or any parts thereof shall mean installing Subcontractor acceptance of the substrate.
			1. Do not install roof coating over saturated insulation
			2. Do not install spray polyurethane foam and roof coating over saturated substrates
		2. As a requirement for meeting warranty conditions the existing roof system must be tested for leaks. It is the installing Subcontractor’s responsibility to verify the existing roof membrane and assembly are dry and leak free prior to installation of roof coating.
			1. Maintain a copy of moisture detection survey for reference and verification of substrate condition prior to installation of spray polyurethane foam and roof coating.
			2. Moisture detection survey includes all of the following:
				1. Visual inspection
				2. Moisture analysis; choose from one or more of the following:

Infrared Thermography

Nuclear Scan

Electric Capacitance / Impedance Testing

Core samples

* + 1. Adhesion Test:
			1. Not required.
		2. Verify existing substrate and assembly flashings are dry, leak-free, and in accordance with Spray Foam and Roof Coating Manufacturer’s published literature.
			1. Contact Spray Foam and Roof Coating Manufacturer prior to spray polyurethane foam and coating installation where substrates are irreparable and require cover board.

* + 1. Verify skylights, scuppers, gutters, penetrations, and structures located within area of Work are firmly secured and in good working condition prior to installation. Clean, repair, or replace to correct substrate deficiencies as required in accordance with MB/BUR Roofing Membrane Manufacturer’s published literature to obtain a continuous and secure substrate in accordance with Spray Foam and Roof Coating Manufacturer’s published literature prior to installation of spray polyurethane foam and roof coating.
		2. Existing assembly must be continuous and secured prior to application of spray polyurethane foam and roof coating.
		3. Do not apply spray polyurethane foam and roof coating until substrate and environmental conditions are in accordance with Spray Foam and Roof Coating Manufacturer’s published literature.
	1. PREPARATION
		1. All surfaces must be sound, dry, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
		2. Existing roof membrane, insulation, and all substrates must be dry and in accordance with Spray Foam and Roof Coating Manufacturer’s published literature prior to installation of roof coating.
		3. Gravel removal:
			1. Fully embedded gravel:
				1. Not required.
			2. Loose and partially embedded gravel:
				1. Remove gravel and prepare existing roof membrane taking caution not to inject water into roofing substrate.
				2. Acceptable methods of gravel removal

Dry vacuum

Wet vacuum

* + - 1. Refer to Spray Foam and Roof Coating Manufacturer published literature.
		1. Surface Cleaning:
			1. Confirm local ordinances and jurisdiction restrictions prior to selecting from the following cleaning methods.
			2. Clean and prepare existing membrane roofing taking caution not to inject water into roofing substrate.
			3. Acceptable Methods of Cleaning
				1. Pressure washer with greater than 2000psi.
				2. Algae, mildew, or fungus:

Treat with a tri-sodium phosphate (TSP) or equivalent non-filming detergent and water solution.

Clear water rinse until all cleaning residue is removed.

* + - * 1. All substrate areas must be completely dry prior to spray polyurethane foam and roof coating application.
				2. Refer to Spray Foam and Roof Coating Manufacturer’s published literature.
		1. All areas must promote positive drainage.
			1. Contact Spray Foam and Roof Coating Manufacturer’s technical support or local sales representative for ponding area repair procedures.
		2. Removal and replacement of existing roof membrane, wet insulation and /or defective roof substrate:
			1. Completely remove existing roof membrane, wet insulation, and /or defective materials and replace roofing membrane to match existing in accordance with MB/BUR Roofing Membrane Manufacturer published literature.
			2. Replace insulation and roofing membrane to match existing ensuring a continuous and flush substrate; secure in accordance with MB/BUR Roofing Membrane Manufacturer published literature.
			3. Contact Spray Foam and Roof Coating Manufacturer’s technical support or local sales representative for project specific detailing, repair procedures, and minimum cure times prior to installation of spray polyurethane foam and roof coating where new roof membrane transitions to existing roof membrane.
		3. Detailing/Flashing:
			1. All detailing and flashings shall be completed prior to installation of spray polyurethane foam and roof coating.
			2. All detailing and flashings shall be installed per Spray Foam and Roof Coating Manufacturer’s published literature.
			3. Existing assembly must be continuous and secure prior to application of spray polyurethane foam and roof coating.
			4. Repair defects including splits, cracks, blisters, deteriorated flashings, ridging of felts, cracked metal edging, and any other defects affecting the water tightness of the roofing system in accordance with SPFA guidelines and Spray Foam and Roof Coating Manufacturer’s published literature.
			5. Blisters; choose from one of the following methods:
				1. Less than six (6) inches in diameter:

Nailable substrates:

Remove gravel from blister of existing roof membrane where applicable.

Slit blister.

Fasten and secure cut edges to roof deck using square head nails or screws and plates.

Non-nailable substrates:

Cut and remove to deck.

* + - * 1. Greater than six (6) inches in diameter:

Cut and remove to deck.

* + - 1. Ridging of felts:
				1. Cut out defect to provide a smooth flat surface.
				2. Remove gravel from cut edges of existing roof membrane where applicable.
				3. Fasten and secure cut edges to roof deck using square head nails or screws and plates.
				4. Deep voids left from vacant ridge may be filled with spray polyurethane foam to promote positive drainage.
			2. Refer to Spray Foam and Roof Coating Manufacturer’s detail drawings for installation procedures including, but not limited to, the following:
				1. Equipment platform
				2. Expansion joints
				3. Parapets
				4. Penetrations
				5. Perimeter edge
				6. Roof curbs
				7. Roof drains
				8. Skylights
				9. Thru-Wall Scuppers
		1. Edge Metal:
			1. Fabricate and install twenty-four (24) gauge metal foam stop where required in accordance with Spray Foam and Roof Coating Manufacturer’s published literature.
			2. Etch and prime surfaces as recommended by Spray Foam and Roof Coating Manufacturer prior to installation of spray polyurethane foam and roof coating.
	1. INSTALLATION
		1. Ensure substrate is ready to receive spray polyurethane foam and roof coating in accordance with Spray Foam and Roof Coating Manufacturer’s published literature.
		2. Roof coating may settle during storage. Mix roof coating prior to use with drill and mixer blade until consistent viscosity is achieved.
		3. Environmental Conditions:
			1. Do not apply primers, spray polyurethane foam, or roof coating when inclement weather conditions are predicted during the application and curing period.
			2. Temperature Limitations:
				1. Spray polyurethane foam:

Substrate temperature must be above 45 degrees F (7 degrees C) and rising and 6 degrees F (3 degrees C) above dew point temperature and rising.

* + - * 1. Roof Coating:

Substrate temperature must be above 35 degrees F (2 degrees C) and rising and at least 6 degrees F (3 degrees C) above the dew point temperature and rising.

* + - 1. Wind:
				1. Wind velocity shall not exceed 12-15 miles per hour.
		1. Spray polyurethane foam installation shall be limited to areas where specified thicknesses can be achieved and coated for over-night protection by end of day in accordance with Spray Foam and Roof Coating Manufacturer published literature.
		2. Detailing/Flashing:
			1. All detailing and flashings shall be completed prior to installation of spray polyurethane foam and roof coating.
			2. All detailing and flashings shall be installed per Spray Foam and Roof Coating Manufacturer published literature.
			3. Existing assembly must be continuous and secure prior to application of spray polyurethane foam and roof coating.
			4. Refer to Section 3.02 Preparation.
		3. Application of Spray Polyurethane Foam:
			1. Prime substrate in accordance with Spray Foam and Roof Coating Manufacturer published literature.
			2. Apply spray polyurethane foam in accordance with SPFA and NRCA guidelines.
			3. Apply spray polyurethane foam to promote positive drainage and at a minimum overall slope to comply with local ordinances.
				1. Slope at edge metal, roof drains, and scuppers:

Taper spray polyurethane foam at minimum 1/4 inch per foot (1:48) slope and a distance of up to three (3) feet from edge or drain outlet.

* + - 1. Lift thickness:
				1. Install spray polyurethane foam in accordance with SPFA guidelines
				2. Apply spray polyurethane foam to promote positive drainage.
				3. Field of roof:

Smooth surfaces:

Minimum one (1) inch thick

Rough surfaces:

Minimum one and a half (1.5) inches thick

* + - * 1. Refer to Spray Foam and Roof Coating Manufacturer published literature.
			1. Surface Finish:
				1. Acceptable textures: Orange peel, coarse orange peel, verge of popcorn.
				2. Unacceptable textures: Popcorn and tree bark.
		1. Roof Marking:
			1. Mark desired area in accordance with published literature so that the appropriate amount of roof coating is applied per square. Re-measure prior to installation of second coat to ensure proper millage requirements.
			2. Contact Spray Foam and Roof Coating Manufacturer for roof marking instructions.
				1. Coverage rates are theoretical and do not take into account for material loss due to spraying, surface texture, waste, etc.
				2. Install a test patch to determine how much coating per square is required over asphaltic textured surfaces.
				3. Adjust application rates based on test patch results in order to meet specified requirements.

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SPEC NOTE: Warranty configurations are based off of overall roof coating thickness. Coordinate “3.03.H. Application of Roof Coating” with “1.11 Warranty”. Choose from the following application methods and delete sections not applicable to project.

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* + 1. Application of Roof Coating:
			1. Application rates apply to both Material Plus and Gold Seal Warranties.
			2. Ten (10) year warranty:
				1. Base Coat:

Apply roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

* + - * 1. Top Coat:

Apply roof coating perpendicular to preceding cured roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Total dry thickness shall be in accordance with warranty requirements.

* + - * 1. Optional Granules:

Apply roof coating perpendicular to preceding cured roof coating at three-quarter (0.75) gallon per square [Twelve (12) wet mils]

Broadcast roof granules into wet roof coating at a minimum thirty (30) pounds per square in accordance with manufacturer published literature.

Allow roof coating to dry.

* + - 1. Fifteen (15) year warranty:
				1. Base Coat:

Apply roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

* + - * 1. Intermediate Coat:

Apply roof coating perpendicular to preceding cured roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

* + - * 1. Top Coat:

Apply roof coating perpendicular to preceding cured roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Broadcast roof granules into wet roof coating at a minimum thirty (30) pounds per square in accordance with manufacturer published literature.

Total dry thickness shall be in accordance with warranty requirements.

* + - 1. Twenty (20) year warranty:
				1. Base Coat:

Apply roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

* + - * 1. Intermediate Coats:

Apply roof coating perpendicular to preceding cured roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

Apply roof coating perpendicular to preceding cured roof coating at one and a half (1.5) gallons per square [Twenty-four (24) wet mils]; Fifteen (15) mils DFT.

Allow roof coating to dry.

Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.

* + - * 1. Top Coat:

Apply roof coating perpendicular to preceding cured roof coating at one (1) gallon per square [Sixteen (16) wet mils]; Ten (10) mils DFT.

Broadcast roof granules into wet roof coating at a minimum thirty (30) pounds per square in accordance with manufacturer published literature.

Total dry thickness shall be in accordance with warranty requirements.

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SPEC NOTE: For added traction at areas anticipating periodic traffic due to roof maintenance and around mechanical equipment install an additional layer of roof coating in accordance with “3.03.I Walkways”.

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* + 1. Walkways: (optional)
			1. Verify overall spray polyurethane foam and roof coating is in accordance with warranty requirements.
			2. Verify substrate is thoroughly clean and free of debris or contamination prior to subsequent application. Wash roof coating as required and allow roof coating to dry.
			3. Apply additional roof coating at traffic areas at a minimum one (1) gallon per square (Sixteen (16) wet mils).
			4. Apply silica sand or quartz uniformly into wet roof coating at a rate of 20-30 pounds per 100 square feet.
			5. Allow roof coating to dry.
			6. Remove loose particles to avoid clogging drains.
	1. FIELD QUALITY CONTROL
		1. Limit traffic on roof coated surfaces for a minimum of two (2) days. Damage to surface by other trades shall not be the responsibility of the installing Subcontractor.
		2. Final Observation and Verification:
			1. Final inspection of spray polyurethane foam and roof coating membrane assembly shall be carried out by the Owner’s representative, the installing Subcontractor, or Spray Foam and Roof Coating Manufacturer as required by warranty.
				1. Gold Seal Warranty requires Manufacturer final observation and verification for warranty issuance.
			2. Contact Spray Foam and Roof Coating Manufacturer for warranty issuance requirements.
	2. CLEANING
		1. Promptly as the Work proceeds, and upon completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
		2. Check area to ensure cleanliness and remove debris, equipment, and excess material from the site.

END OF SECTION