SECTION 07 56 00
FLUID-APPLIED ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section specifies a roof coating preparation including preparation of concrete deck and substrate to receive fluid-applied flashing.

B. Application of fabric-reinforced fluid-applied roof membrane and flashings to prepared existing concrete deck.

1.2 QUALITY ASSURANCE:

A. Manufacturer’s Qualifications: Obtain products from single manufacturer or from sources recommended by manufacturer for use with fluid applied roofing and incorporated in manufacturer’s warranty.

B. Installers Qualifications: Work is to be performed by installer having three (3) years’ experience for work relating to this section and approved in writing by fluid applied roofing manufacturer.

C. Roof coating pre-installation conference: Conduct a pre-installation conference with the Installer, roofing manufacturer’s representative and COR to review project requirements and installation methods and procedures. Items to be reviewed include:

1. Drawings and specifications.
2. Coating manufacturer’s written installation instructions, including surface preparation.
3. Drainage during each stage of coating, including drain plugging and plug removal procedures.
4. Finalize the installation schedule and confirm availability of materials and installer’s personnel.
5. Location and specific requirements related to base flashing, drainage locations, penetrations and other conditions that will affect installation.

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Samples:

1. 150 mm (6 inch) square cured sheet of roofing system without backing, showing color, and texture.
2. System proposed for flashing and reinforcing.

C. Manufacturer's Certificates:

1. Installer approval.
2. Certificate stating that material utilized on the job will be of the same formulation as materials covered by the test report.

D. Manufacturer's Literature and Data:
1. Coating system materials giving physical properties, wet mil thickness in relation to dry mil thickness, and other related information.
2. Manufacturer's printed instructions for application of coating materials to be installed.

E. Test Reports: Test report from an independent commercial testing laboratory showing that materials meet specified requirements.

F. Manufacturer warranty.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to job site in manufacturer's original factory sealed containers labeled to identify product, manufacturer and point of manufacture.

B. Observe precautions appropriate to flammable materials and "safety notes" included in coating material manufacturer's printed instructions to installer before, during, and immediately following application of these materials.

1.5 JOB CONDITIONS:

A. Install fluid applied roofing only on dry surfaces free of water, surface condensation, rain, snow, ice, frost, dirt and debris.

B. Do not proceed when temperature of surfaces to receive coating and flashing, is lower than 5 degrees C (40 degrees F).

C. Complete work on roof deck and install penetrations and projections through roof deck before roofing and flashing work is applied.

D. Maintain emergency egress from the Boiler Plant at all times.

1.7 WARRANTY:

A. Construction Warranty: Comply with FAR clause 52.246-21 “Warranty of Construction”.

B. Manufacturer Warranty: Manufacturer shall warranty their fluid applied roofing for a minimum of twenty (20) years from date of installation and final acceptance by the Government.

C. Installer’s Warranty: Installer shall warranty their work for a minimum of two (2) years from date of final acceptance by the Government.

D. Manufacturer Inspection and Preventative Maintenance Requirement: By manufacturer’s technical representative, to report maintenance

responsibilities to the Government necessary for the preservation of the Government's warranty rights. The cost of the manufacturer's inspections and preventive maintenance is included in the contract sum. Inspections to occur in years 2, 5, 10 and 15 following date of acceptance by the Government.

1.8 APPLICABLE PUBLICATIONS:

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

B. ASTM International (ASTM):

D3960.....Volatile Organic Compounds in Liquid Applied Roofing Materials

D1079 .....Standard Terminology Related to Roofing and Waterproofing

D750-12.....Rubber Deterioration in Carbon-Arc Weathering Apparatus

D1149-07(R2012).....Rubber Deterioration-Surface Ozone Cracking in a Chamber

E96/E96M-13.....Water Vapor Transmission of Materials

PART 2 - PRODUCTS

2.1 ROOFING MATERIALS:

A. Obtain components for coating system from same manufacturer.

B. Basis of Design Manufacturer: The roof coating system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Subject to compliance with requirements, shall provide and install the basis-of-design product or an approved equivalent.

1. Polyurethane roof coating base coat, single-part moisture curing, for use with a compatible top coat: Basis of design product AlphaGuard MT Base Coat or approved equivalent.
2. Polyurethane roof coating system top coat, low odor, low VAC single part, for application over compatible base coat: Basis of design product AlphaGuard MT TC or approved equivalent.
3. Top coat color: Patina Green or approved equivalent.

C. Coating materials are to meet the following requirements:

Property	Test Method	Base Coat	Top Coat
Combustible Characteristics	UL790	Pass	Pass
Volatile Organic Compounds (max)	ASTM D3960	35 g/L	40 g/L
Hardness, Shore A	ASTM D2240	80	85
Solids by Volume	ASTM D2697	87%	87%
Accelerated Weathering (After 5000 hours in Weatherometer)	ASTM G154	Pass	Pass
Solar Reflectance Index	ASTM E1980	- -	>105

2.2 CONCRETE/CEMENT PRIMER:

A. Primer shall be a two-component, 100% solids, epoxy penetrating primer made specifically for application to concrete and cement.

B. Primer shall be compatible with roof coating system.

C. Basis of design primer: Tremco AlphaGuard C-Prime or approved equivalent.

2.3 METAL SURFACE PRIMER:

A. Metal surface primer shall be a single-component, water based primer to promote adhesion of the base coat to metal surfaces.

B. Primer shall be compatible with roof coating system.

C. Basis of design primer: Tremco AlphaGuard M-Prime or approved equivalent.

2.4 ASPHALTIC SURFACES PRIMER:

A. Asphaltic surface primer shall be a single-component, multi-substrate primer to promote adhesion of the base coat to surfaces recommended by the manufacturer.

B. Primer shall be compatible with roof coating system.

C. Basis of design primer: Tremco AlphaGuard WB-Prime or approved equivalent.

2.5 REINFORCING FABRIC:

A. Polyester reinforcing fabric that is 100% stitch bonded, mildew-resistant intended for reinforcement of compatible fluid-applied coatings and flashings.

B. Fabric shall be compatible with roof coating system.

C. Basis of design reinforcing fabric: Tremco Permafab or approved equivalent.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACE:

A. Verify that surfaces to receive coating and flashing are in sound condition and free of projections, depressions, grease, oil, asphalt, tar, paint, wax, dust, or other debris that may prevent proper application of coating.

B. Allow concrete and/or cementitious surfaces to cure a minimum of 28 days and clean free of waterproofing agents, form release agents, and curing agents that might act as bond breakers. Proceed only when maximum moisture content of the substrate as measured with a moisture meter is 16 percent.

C. Detergent Cleaning: Remove oil, grease smear and asphalt residue with trisodium phosphate. For oil contaminated surfaces, use steam cleaning in conjunction with a strong emulsifying detergent. Rinse thoroughly with potable water.

D. Mechanical Abrasion: Smooth precast and formed concrete surfaces must be cleaned, roughened and made absorptive by mechanical abrasion. Remove surface laitance and abrade surface to CSP 3-6 in accordance with ICRI Guideline 310.

E. Acid Etching: Where mechanical abrasion cannot be utilized, acid etch concrete deck with 15 percent hydrochloric acid solution. Following etching, flush surface with water to neutralize the surface; remove salts and residue from the reaction.

F. Testing: Following surface preparation, perform testing to verify concrete substrate is adequate prepared to receive fluid-applied coating in accordance with manufacturer's written instructions.

1. PH Test: Verify pH level is within range acceptable to roofing manufacturer when tested per ASTM D 4262.

2. Pull Test: Verify that the cleaned surface pulls concrete when tested per ASTM D 4541.

3. Moisture Test: Verify that concrete substrate is visibly dry and free of moisture when tested by plastic sheet method per ASTM D 4263.

G. Report adverse roof deck conditions of any type in writing to Contracting Officer Representative (COR). Commencement of work

constitutes acceptance of roof surfaces by installer as satisfactory for application of roofing and flashing.

3.2 PREPARATION OF EXISTING FLASHINGS:

A. Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components that cannot be repaired to weathertight and like-new condition.

B. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris, and prepare for application of re-coating system.

C. Do not damage metal counterflashings that are to remain. Replace damaged metal counterflashings with counterflashings of same metal, weight or thickness, and finish.

D. Roof Drains: Remove drain strainer and clamping ring. Grind metal surfaces down to clean, bare, metal. Prime metal surfaces with manufacturer's recommended primer.

E. Confirm and/or restore functionality of roof drains at the end of each work day.

3.3 APPLICATION:

A. Install coating with tools and equipment approved by coating material manufacturer. Wet film thickness of coating materials to be as recommended by coating material manufacturer to obtain the specified dry film thickness. Check wet film thickness frequently by use of a wet mil thickness gauge. Control application of fluid-applied material by maintaining careful balance at all times between material consumption and area covered. Apply quantity of coats to achieve minimum dry film thickness as required by the coating manufacturer.

B. Fluid Applied Flashing Application: Fluid-Applied Flashing and Detail Base Coat Application: Complete base coat and fabric reinforcement at parapets, curbs, penetrations, and drains prior to application of field of fluid-applied membrane. Apply base coat in accordance with manufacturer's written instructions.

1. Extend coating minimum of 8 inches (200 mm) up vertical surfaces and 4 inches (100 mm) onto horizontal surfaces.
2. Back roll to achieve minimum coating thickness of 48 mils (1.2 wet mm) unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.

3. Embed fabric reinforcement into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
4. Roll surface of fabric reinforcing to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
5. Roof Drains: Install base coat onto surrounding membrane surface and metal drain bowl flange. Install target piece of fabric reinforcement immediately into wet base coat and roll to fully embed and saturate fabric. Reinstall clamping ring and strainer following application of top coat. Replace broken drain ring clamping bolts.
6. Allow base coat to cure prior to application of top coat.
7. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of fabric reinforcement.

C. Fluid-Applied Coating Application:
1. Surface Priming: Prime surfaces to receive fluid-applied coating using coating manufacturer's recommended product for surface material. Apply at application rate recommended by manufacturer.
   a. Ensure primer does not puddle and substrate has complete coverage.
   b. Allow to cure completely prior to application of coating. deck.
2. Base Coat: Apply base coat in accordance with manufacturer's written instructions. Back roll to achieve minimum coating thickness of 48 wet mils (1.2 wet mm) unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
   a. Apply base coat on prepared and primed surfaces and spread coating evenly.
   b. Embed fabric reinforcing fabric into wet base coat. Lap adjacent flashing pieces of fabric minimum 3 inches (75 mm) along edges and 6 inches (150 mm) at end laps.
   c. Roll surface of fabric reinforcing fabric to completely embed and saturate fabric. Leave finished base coat with fabric free of pin holes, voids, or openings.
   d. Allow base coat to cure prior to application of top coat.
   e. Following curing of base coat and prior to application of top coat, sand raised or exposed edges of fabric reinforcement.

3. Top Coat: Apply top coat uniformly in a complete installation to field of roof and flashings.
   a. Prime base coat prior to application of top coat if top coat is not applied within 72 hours of the base coat application, using manufacturer's recommended primer.
   b. Apply top coat to flashings extending coating up vertical surfaces and out onto horizontal surfaces 4 inches. Install top coat over field base coat and spread coating evenly.
   c. Back roll to achieve wet mil thickness of 32 wet mils (0.8 wet mm) unless thicker application is recommended by manufacturer.
   d. Avoid foot traffic on new fluid-applied membrane for a minimum of 24 hours.

3.4 FIELD QUALITY CONTROL

A. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation, and submit report to the COR. Notify COR at least 48 hours in advance of dates and times of inspections. Inspect work as follows:
   1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
   2. Following application of re-coating to flashings and application of base coat to field of roof.
   3. Upon completion of re-coating but prior to re-installation of other roofing components.

B. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.

C. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.5 PROTECTING AND CLEANING

A. Protect roofing from damage and wear during remainder of construction period. Repair damage to coating or other work prior to project completion.

B. Correct deficiencies in or remove coatings that do not comply with requirements, repair substrates, and reapply coatings.

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

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