

SECTION 07560

FLUID APPLIED ROOFING (OVER RIGID INSULATION, DENSDECK, & PLYWOOD)

Updated – January 23, 2008

PART 1 GENERAL

1.1 DESCRIPTION

1. Fluid applied flexible acrylic waterproofing system over ISO (Polyisocyanurate), EPS (Expanded Polystyrene), DensDeck or plywood (exterior grade non-treated). This work shall include the preparation of the roof deck, application of the roof system, flashing system, and clean up.

1.2 DESCRIPTION OF FLUID APPLIED ROOFING SYSTEM

The fluid applied roofing system must consist of a reinforced elastomeric system specifically designed for use on a roof. The system must have been approved by FMRC (Factory Mutual Research Corporation) according to Standard 4470 for Class 1 Roof Constructions which includes- Spread of Flame Fire, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage Classifications.

1.3 RELATED WORK

1. The contractor shall review all sections of these specifications to determine items of work that will interface with the application of this roofing system. Coordination and execution of related sections shall be the responsibility of the contractor.

1.4 REFERENCES

1. ASTM B117 - Test Method of Salt Spray (Fog) Testing.
2. ASTM G-29 - Test Methods for Algae Resistance.
3. ASTM E-108 - Test Method for Fire Test of Roof Coverings.
4. ASTM D-1653 - Water Vapor Transmission of Materials.
5. ASTM G26 - Practice for Operating Light- and Water-Exposure Apparatus (Xenon Arc Type) for Exposure of Nonmetallic Materials.
6. ASTM D-412- Ultimate Tensile Strength at Break.
7. ASTM D-6083- Standard Specification for Liquid Applied Acrylic Coatings used in roofing.

8. ASTM C1549- Standard test method for determination of solar reflectance near ambient temperature using a portable solar reflectometer
9. ASTM C1371- Standard test method for determination of emittance of materials near room temperature using portable emissometers
10. FM 4470- Standard for Class 1 Spread of Flame Fire, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage Classifications.

1.5 SUBMITTALS

1. Shop Drawings: Submit a scaled drawing showing the layout of joint reinforcing and all flashing details.
2. Product Data: Provide manufacturer's technical literature on products that make up the roofing system. This shall include, but is not limited to, coatings, reinforcing fabrics, flashing materials, roof drains, fasteners, etc..
3. Manufacturer's Installation Instructions: Submit all data sheets available from the manufacturer on the installation of the roofing system applicable to the work.
4. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 QUALIFICATIONS

1. Applicator Qualifications: The applicator of the roofing material specified herein shall be an approved applicator (designated by Hydro-Stop LLC). Proof of this qualification shall be provided in written form from the manufacturer of the roofing system.

1.7 QUALITY CONTROL

1. Codes and Standards: The contractor shall make him/herself thoroughly familiar with all codes, regulations, and standards governing the specified work. Any contradiction between the manufacturer's requirements and these specifications shall be brought to the attention of the manufacturer and the specifier
2. Deviations: There shall not be any deviations from these specifications unless the deviation is submitted in writing to the specifier. The request for deviation must have a letter from the roofing manufacturer's technical department approving the details of the deviation.
3. An Approved Applicator (as designated by Hydro-Stop LLC) shall be on site during all applications of any Hydro-Stop products.

4. Manufacturer's Technical Representative: An employee of the roofing material manufacturer shall be on site at least once every 7-calendar days during the work specified herein. Upon request the technical representative shall provide a written inspection report, during each site visit and submit the reports to the owner/owner's representative. The manufacturer's representative must approve the application process at specific stages before the contractor may continue including: Prior to the application of the FoundationCoat and fabric, at the completion of the FoundationCoat and fabric, and after the FinishCoat is applied.

1.8 DELIVERY, STORAGE, AND HANDLING

1. Deliver materials to site in manufacturer's unopened and undamaged containers bearing the following information:
 1. Name of manufacturer.
 2. Name of contents and products code.
 3. Net volume of contents.
 4. Lot or batch number.
 5. VOC content
 6. Storage temperature limits.
 7. Shelf life expiration date.
 8. Mixing instructions and proportions of contents.
 9. Safety information and instructions.
2. Store and protect materials from damage and weather in accordance with manufacturer's instructions.
3. Store materials at temperatures between 50 and 90 degrees F (10 and 32 degrees C). Keep out of direct sunlight.
4. Support stored material containers on pallets and cover with tarpaulin tied to bottom of pallets.

1.9 ENVIRONMENTAL REQUIREMENTS

1. Do not apply if ambient temperatures are expected to fall below 40 degrees F (4.5 degrees C) or if rain is expected before the application has time to dry.

1.10 WARRANTY

1. Provide ten-year manufacturer's Labor and Material warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

- | | | |
|----------------------------|------------|--------------------|
| 1. Hydro-Stop, LLC | Toll Free: | (800) 739-5566 |
| 1465 Pipefitter Street | Phone: | (843) 745-9600 |
| North Charleston, SC 29405 | Fax: | (843) 745-9602 |
| | Web: | www.hydro-stop.com |

2.2 MEMBRANE COMPOUND MATERIAL

1. Waterproofing Material: PremiumCoat three-stage, fabric reinforced, flexible acrylic coating, fluid applied in successive stages to form one continuous, seamless, watertight membrane; 40 mil (.04 inches / 1.016 millimeters) minimum cured total system thickness; comprised of the following:
 1. Foundation and Saturation Coats: PremiumCoat FoundationCoat (highly flexible water based 100% pure acrylic polymer resin coatings).
 2. Fabric: Hydro-Stop polyester, non-woven, stitch-bonded, and heat-set fabric.
 3. Finish Coat: PremiumCoat FinishCoat (ultraviolet light resistant, blend of highly flexible water based 100% pure acrylic polymer resin coating); color as selected from manufacturer's standard colors.
2. Reinforcing Fabric: This material shall be non-woven 100% polyester, stitch bonded, heat set fabric with the following characteristics:

Weight:	3 oz / per square yard (106.31 grams / square meter)		
Tensile Strength	Warp	74 lbs. (33.60 kg)	per ASTM D 5034
	Fill	45 lbs. (20.43 kg)	
Elongation @ Break	Warp	21.3%	per ASTM D 5034
	Fill	51.3%	
Ball Burst		111 lbs. (50.39 kg)	per ASTM D 3787
Trapezoid	Warp	13.5 lbs. (6.13 kg)	per ASTM D 117
	Fill	24.2 lbs. (10.99 kg)	
Thickness		.018 inches (.457 mm)	per ASTM D-1777

3. Cured Membrane Characteristics:

<u>PROPERTY</u>	<u>TEST</u>	<u>RESULT</u>
Elongation	ASTM D638	>300% elastomeric
Tensile Strength (cured)	ASTM D412	>2000 PSI (13,789 kPA)
Density:		12.1 lb/gal
Volume Solids:		> or = 53 %
Weight Solids:		> or = 66%

Algae Resistance	ASTM G29	No Growth Supported
Moisture Vapor	ASTM E96	3 Perms
Weathering	ASTM G26	No effect after 3,000 hours.
Salt Spray Test	ASTM B117	No effect.
Fire Rating	ASTM E108	Class A
VOC (calculated):		< 72 g/L
Susceptibility to Leakage	FM 4470	No signs of water leakage.
Windstorm Pressure	FM 4470	Meets Class 1- 90
Windstorm Pull	FM 4470	Class 1-225 on Polyisocyanurate
“	“	Class 1-270 on Expanded Polystyrene
“	“	Class 1-375 on Lightweight Concrete
“	“	Class 1-735 on Structural Concrete
Severe Hail Test	FM 4470	No separation or rupture 1-SH
Resistance to Foot Traffic	FM 4470	No sign of tearing or cracking.
Liquid Applied Acrylic		ASTM D6083 Approved
Solar Reflectance	ASTM C1549	> or = 0.90
Thermal Emittance	ASTM C1371	> or = 0.79
OTC (Ozone Transport Commission)		Compliant
California Title 24		Compliant
CRRC (Cool Roof Rating Council)		Approved
Energy Star (Dept. of Energy)		Approved
<i>(White or Cotton Finish Coat Only)</i>		

2.3 INSULATION BOARD MATERIALS

1. Acceptable recovery boards:

Polyisocyanurate - 1.5 in. (3.81cm) minimum thickness. Max board size 4ft.x 8ft. (1.219m x 2.438m) if mechanically fastened or 4ft.x 4ft. (1.219m x 1.219m) if adhered with Factory Mutual approved roofing adhesive. Closed cell with factory laminated facer. Foam core to have rated flame spread of 25 in. (63.5cm.) or less and minimum compressive strength of 250 psi. (1724 kPA)

Expanded Polystyrene -1.5 inches (3.81cm) minimum thickness a minimum of 1.5 lb/ft³ (24.30 kg/m³) density. Max board size is 4ft. x 8ft. (1.219m x 2.438m) mechanically fastened or 4ft x 4ft (1.219m x 1.219m) if adhered with Factory Mutual approved roofing adhesive.

Plywood - ¾ inch (1.905 cm.) minimum thickness tongue and groove exterior B&C grade. (Non-treated). Plywood is to be adhered with sub-floor adhesive and deck fasteners.

Densdeck - ¼ inch (.635 cm.) minimum thickness if used over an approved smooth existing substrate. ½ inch (1.27 cm.) thickness is the normal recommendation.

Tapered ISO or EPS – 1.5 inches (3.81cm) minimum thickness a minimum of 1.5 lb/ft³ (24.30 kg/m³) density. Max board size is 4ft x 4ft (1.219m x 1.219m) with a slope of not less than .25 inch per foot (2.083cm/meter).

2. Unacceptable recovery boards-

OSB – any type., Blue Board (Dow Co.), High Density Board, Perlite, and Treated Plywood.

2.4 ACCESSORIES

1. Adhesive: Insta-Stick, OlyBond, or FM (Factory Mutual) approved polyurethane adhesive, dispensed from pre-pressurized containers. Application guild lines should be dictated by the adhesive manufacture.
2. Mechanical Fasteners (preferred method): Use mechanical fasteners with plates. Fastener patterns as to be recommended by the board manufacture.
3. Cant Strips: Recommended composition materials are EPS (Expanded Polystyrene), ISO (Polyisocyanurate), and wood (non-treated). Cant strips are to be installed at all internal corners, around curbs, and at all 90 degree angles specified by Hydro-Stop LLC
4. Moisture Breathers: Install moisture breathers as recommended by Hydro-Stop LLC Technical Personal.
5. Hydro-Fiber: Bulking material used in conjunction with Foundation Coat or BarrierGuard slurry (as specified by Hydro-Stop Technical Representative) to fill cracks, voids, or low depressions on various substrates.
6. StableRust Primer: water based surfactant-free primer used in direct metal applications to stabilize and protect metal surfaces.

PART 3 **EXECUTION**

3.1 EXAMINATION

1. Verify substrate surfaces are durable, free of frozen matter, dampness, loose particles, cracks, pits, projections, or foreign matter detrimental to adhesion or application of waterproofing system.
2. Verify that substrate surfaces are smooth and not detrimental to full contact bond of waterproofing materials.
3. Verify items that penetrate surfaces to receive waterproofing are securely installed.
4. Verify that substrate areas are adequately supported and firmly fastened in place.

5. Verify that roof deck has a minimum slope of .25 inch / foot (2.083cm/meter)
6. Verify that roof does not have ponding water areas.
7. Verify that all attached vertical walls are properly waterproofed.

3.2 PREPARATION

1. Protect adjacent surfaces not designated to receive waterproofing.
2. Do not apply waterproofing to surfaces unacceptable to manufacturer.

3.3 INSTALLATION - INSULATION

1. Adhere insulation to deck with Polyurethane adhesive or proper fasteners in accordance with manufacturer's installation instructions to meet a minimum uplift requirement of 1-90. Please verify the proper uplift requirements with the specifier or your local building code authority.
2. Stager all board joints.
3. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
4. Apply no more insulation than can be covered with waterproofing on the same day.
5. Install cant strips at internal corners and metal drip edge on outside perimeter.

3.4 WATERPROOFING APPLICATION

1. Foundation Coat & Fabric Components- Consist of one coat of FoundationCoat applied to the substrate, Hydro-Stop PremiumCoat Fabric (sizes vary) laid into the wet FoundationCoat, and finally a second coat of FoundationCoat saturating the fabric from above. Care should be given to ensure that adjacent runs of fabric are overlapped a minimum of 4 inches (10.16 cm). Foundation Coats are applied at a total rate of 25-40 ft²/gal (.594 - .951 m²/liter) depending on substrate. FoundationCoat should only be applied with the use of approved roof brushes. Rolling and spraying of the FoundationCoat are absolutely forbidden.
 - A. Recovery Board Seams- Using 6 inch (30.48 centimeters) fabric and the Foundation components (as described above), waterproof all board seams, cracks, and non-working joints.. Center 6 inch (15.24 centimeters) fabric over all seams.
 - B. Roof Perimeter- Using 12 inch (30.48 centimeters) fabric and the Foundation components (described above), waterproof entire roof perimeter. Continue

waterproofing up vertical surfaces and onto deck a minimum of 6 inches (15.24 centimeters) in each direction.

- C. Roof Penetrations- Using 12 inch (30.48 centimeters) fabric and the Foundation components (described above) seal items projecting through waterproofing material watertight. Waterproof up penetrations a minimum of 6" (15.24 centimeters)
 - D. Roof Field- Using 40 in. (1.016 m) fabric and the Foundation components (as described above) seal the entire roof field. Overlap adjacent runs of fabric 4 inches (10.16 cm) minimum
- 3. Finish Coat Component- Apply 2 coats of FinishCoat at a combined total rate of 70 ft²/gal (1.664 m²/liter) over entire roof area. Minimum milage requirements are 11.5 mils (.0115 inches / .292 millimeters) wet and 6.1 mils (.0061 inches / .155 millimeters) dry per coat. Allow to dry between coats. Total Finish Coat dry thickness should be a minimum of 12.2 mils (.0122 inches / .31 millimeters).
 - 4. Completed PremiumCoat System- System must be installed to a minimum 40 mil (.04 inches / 1.016 millimeters) total cured thickness.

3.5 PROTECTION OF FINISHED WORK

- 1. Monitor finished system for 7 day, sweeping off birdbaths to allow for full cure.

3.6 CLEANING

- 1. Clean unscheduled surfaces receiving waterproofing in accordance with manufacturer's instructions.

END OF SECTION