SINCE 1904

# Pickens Roofing & Sheet Metals, Inc.

300 South Avenue
POST OFFICE BOX 2508
TELEPHONE 582-3485
FAX (803) 585-4352
Spartanburg, South Carolina 29304

June 16, 1994

Norungolo-Davis, Inc.
P. O. Box 1100
Piedmont, SC 29673

Attn: Mike Norungolo

RECEIVED
JUN 23 1994
FLUOR DANIEL, INC.

Re: Greer Weather Forecast
Nexrad Office Building

Dear Sir,

Enclosed are the Flexible Sheet Roofing submittal:

I. ITEM 69 SECTION 07530 PER PART III, SECTION J
LIST OF ATTACHMENTS

A. Install .5 perm polyethylene vapor retarder sheeting loose laid under 1/2" type "X" fire resistant gypsum board, by Georgia Pacific. ( See submittal )

B. Install Manville UltraGard Isocyanurate Roof Insulation, 4" thick screw to deck with insulation fasteners per manufacturers recommendations. (See submittal)

C. Install a white 60 mils adhered E.P.D.M. roof by Manville. (See submittal and samples)

D. Provide a ten (10) year Manville Guarantee and a twenty (20) year membrane material guarantee at completion of the job. (See sample)

F.D.I. VENDOR INFORMATION CONTROL
#10-6074-07530-001-003-000
FLUOR DANIEL INC.
☑ AAP APPROVED
☐ AAN APPROVED AS NOTED
☐ ANR APPROVED AS NOTED AND RESUBMIT
☐ DIS DISAPPROVED AND RESUBMIT
☐ IO INFORMATION ONLY
APPROVAL DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.

CAROLINAS

NATIONAL ROOFING CONTRACTORS ASSOCIATION

Please have the architect approve these submittals so we can order material. Also, ITEM 67 FLASHING AND SHEET METAL will be forwarded by separate letter.

Yours truly,
Pickens Roofing & Sheet Metals,Inc.

James M.Pickens

JMP:brs

Enclosures:
- Roof Submittals
- Sample of Manville Roofing System
- Specimen Manville 10 year Warranty
- Specimen Manville 20 year

# Product Standards and Specifications

| Product | Edge | Thick | Widths | Lengths | Standards ASTM | Standards CSA | Federal Specifications | Application Standards |
|---|---|---|---|---|---|---|---|---|
| Dens-Glass® Gypsum Sheathing | S | ½" | 4' | 8', 9', 10' | C 79* | NA | NA | — |
| Dens-Glass® Firestop® Type X Gypsum Sheathing | S | ⅝" | 4' | 8', 9', 10' | C 79* Type X | NA | NA | — |
| Dens-Shield™ Tile Base and ⅝" Dens-Shield™ Firestop® Type X | S | ½" | 4' | 8' | C 630* | NA | NA | — |
| | | ⅝" | 4' | 8' | C 630* | NA | NA | — |
| Dens-Deck™ Gypsum Roof Board, ⅝" Dens-Deck Firestop® Type X | S | ½" | 4' | 8' | C 79* | — | — | FM 4450 |
| | | ⅝" | | | C 79 Type X | | | |
| Gypsum Board | T | ½" | 4' | 8' to 12' | C 36 | A 82.27 | SS L 30d Type III Grade R | ASTM C840 GA 216 |
| | | ⅜" | 4' | 8' to 12' | | | | |
| | S, T, RE | ½" | 4' | 8' to 12' | | | | |
| | | ⅝" | 4' | 8' to 16' | | | | |
| Firestop® Gypsum Board, Type X, Type XXX and Type C | S, B, T, RE | ½" XXX | 4' | 8' to 16' | C 36 Type X | A 82.27 | SS L 30d Type III Grade X | ASTM C840 GA 216 |
| | | ⅝" XXX | | | | | | |
| | | ⅝" X | | | | | | |
| | | ⅝" C | | | | | | |
| Tile Backer Board | T | ½" | 4' | 8', 11', 12' | C 630 | A 82.97 | SS L 30d Type VII Grade W | ASTM C 840 GA 216 |
| Firestop® Tile Backer | T | ½" | 4' | 8' to 12' | C 630 Type X | A 82.27 | SS L 30d Type VII Grade X, W | GA 216 |
| | | ⅝" | 4' | 8' to 12' | | | | |
| Gypsum Sheathing | S, T & G | ½" | 4' | 8', 9'** | C 79 | A 82.27 | SS L 30d Type II Grade R, W | GA 252 |
| | | ½" | 2'*** | 8' Std* | | | | |
| Firestop® Gypsum Sheathing | S, T & G** | ⅝" | 4' | 8' Std* | C 79 Type X | A 82.27 | SS L 30d Type II Grade R, W | GA 252 |
| Backer Board and Firestop® Backer Board (Special Order) | S | ¾" | 4' | 8' std. | C 442 | A 82.35 | SS L 30d Type IV Grade R, X | ASTM C 840 GA 216 |
| | | ½" | 4' | 8' Std | | | | |
| | | ⅝" | 4' | | | | | |
| Gypsum Coreboard | | 1" | 2' | 8' to 12' | C 422 | — | SS L 30d Type IV Grade R | GA 216 |
| Shaft Liner™ Panels, Type X | S | ¾", 1" | 2' | 2' to 10' | C 422 | — | — | — |
| Gypsum Sound Deadening Board | S | ½" | 4' | 8' | C 422 | A 82.35 | SS L 30d Type IV Grade R | See Test Detail |
| Foil Back Gypsum Board | S, T, RE | ⅜" | 4' | 8' to 12' | C 36 | A 82.27 | SS L 30d Type III Grade R | ASTM C 840 GA 216 |
| | | ½" | 4' | 8' to 16' | | | | |
| | | ⅝" | 4' | 8' to 16' | | | | |
| Firestop® Foil Back Gypsum Board | S, T, RE | ½" | 4' | 8' to 16' | C 36 Type X | A 82.27 | SS L 30d Type III Grade X | ASTM C 840 GA 216 |
| | | ⅝" | 4' | 8' to 16' | | | | |
| Eternawall® Panel | MB | ½" | 4' | 8', 9', 10' | C 960 Class 1 | A 82.27 | SS L 30d Type III Grade R or Grade X, Class III | ASTM C 840 GA 216 |
| | | ⅝" | 4' | 8', 9', 10' | | | | |
| PreDec® Textured Gypsum Paneling for Mobile Homes | S | 5/16" | 4' | Cut-to-size | C 960 Class II | A 82.27 | SS L 30d Type III Grade R Class III | ASTM C 840 GA 216 |
| Dens-Cote® Plaster Base | T | ½" | 4' | 8' to 12' | C 588 | A 82.27 | SS L 30d Type VI Grade R | ASTM C 844 |
| | | ⅝" | 4' | 8' to 12' | | | | |
| Firestop® Dens-Cote® Plaster Base | — | ⅝" | 4' | 8' to 12' | C 588 Type X | A 82.27 | SS L 30d Type VI Grade X | ASTM C 844 |
| Dens-Cote® Plaster | — | — | — | — | C 587 | — | SS P 00402b Type VI | ASTM C 843 |

*Manufacturer's recommendations to relevant [illegible]

Any questions not answered by the information on this page or available from local sources [illegible]

C|H|U|L|L|E|R

# UltraGard® Isocyanurate Roof Insulation

## For Built-Up, Modified Bitumen and Single Ply Roofing Systems

### Description
UltraGard is made from polyisocyanurate foam faced with a special reinforced fiber glass mat facer.

### Application
UltraGard, a polyisocyanurate foam roof insulation, provides high thermal values for roof assemblies over nailable, non-nailable or steel decks. It may be applied using hot asphalt and/or mechanical fasteners. The facers are compatible with BUR modified bitumen and most single ply roofing membrane applications.

### Sizes
UltraGard is available in 48" x 48" (1.22m x 1.22m) and 48" x 96" (1.22m x 2.44m) boards. (The conversion factor to convert inches to millimeters is 25.4 per inch.)

### Advantages
**Membrane Compatibility.** The fiber glass reinforced facer used on UltraGard is suited for hot asphalt BUR and modified bitumen systems and is also compatible with mechanically attached, ballasted and fully adhered EPDM rubber and most other single ply roofing membrane systems.

### Thermal Values
The thermal values of UltraGard were determined in accordance with PIMA Technical Bulletin 101 (RIC/TIMA Technical Bulletin 281-I) using ASTM C 518.

Recent investigations have indicated that reduction in foam thermal performance will continue to occur after the PIMA (RIC/TIMA) six-month conditioning period. The ultimate R-value of these products will depend on individual installation circumstances.

**When calculating the anticipated thermal performance over the expected life of these products, Manville® Roofing Systems suggests the use of an R-value of 5.56 per inch of foam thickness.**

UltraGard Thermal Values.

| Product Designation | Conductance C-Value | Resistance R-Value | Thickness Nominal* |
|---|---|---|---|
| C-17 | .167 | 6.0 | 1.0" |
| C-12 | .12 | 8.3 | 1.3" |
| C-11 | .11 | 9.1 | 1.4" |
| C-10 | .10 | 10.0 | 1.5" |
| C-08 | .08 | 12.5 | 1.8" |
| C-07 | .07 | 14.3 | 2.0 - 2.1" |
| C-06 | .06 | 16.7 | 2.3" |
| C-05 | .05 | 20.0 | 2.7 - 2.8" |
| C-046 | .046 | 21.6 | 3.0" |
| C-043 | .043 | 23.0 | 3.2" |
| C-04 | .04 | 25.0 | 3.3 - 3.4" |
| C-036 | .036 | 28.0 | 3.8" |
| C-033 | .033 | 30.0 | 4.0 - 4.1" |

* Nominal thickness of material depends on the manufacturing location and will vary within the given range.

### MANUFACTURED WITH HCFC'S (HYDROCHLOROFLUOROCARBONS)
UltraGard® is produced with chemicals currently accepted as replacements in the CFC phase-out process, chemicals that significantly reduce the ozone depletion potential. All UltraGard products are manufactured with transition substances known as 141b blowing agents using only HCFC's (hydrochlorofluorocarbons). UltraGard is in compliance with EPA requirements governing all materials produced after May 15, 1993. UltraGard meets the standards of the Clean-Air Act Amendment of 1990.

# UltraGard® Isocyanurate Roof Insulation

# For Built-Up, Modified Bitumen and Single Ply Roofing Systems

### Tapered UltraGard
Tapered UltraGard is the high thermal product of choice for providing positive slope to drain on both new and reroof construction. It is available in 48" x 48" boards, tapered to 1/8" or 1/4" per foot. For more information on Manville® tapered systems, refer to pages 13 and 14.

### Applicable Standards
UltraGard has been rated in Factory Mutual fire and wind resistant systems for BUR, Single Ply and Modified Bitumen constructions. This testing is specific to the roof deck, insulation, fastener, fastener pattern and the membrane. Space limitations preclude listing all approved combinations. For current information on Schuller FM approved systems, contact a Schuller District Technical Services Specialist, Sales Representative, or the current FM Approval Guide .

UltraGard is also classified by Underwriters Laboratories, Inc. and is approved insulation for the following Class A roof constructions. (See current UL Roofing Materials and Systems Directory.) Contact Manville® Roofing Systems for more details and additional approval listings.

### BUR Constructions
3 or 4 ply fiber glass membrane with gravel, smooth or cap sheet surface and over insulated or nailable decks.

### Single Ply Constructions
1. SPM-60FR fully adhered membrane.
2. SPM-60, SPM-60FR, SPM-45, or SPM-60W ballasted membrane.

### Modified Bitumen Constructions
1. DynaKap or DynaPly with asphalt and gravel surface over combustible and noncombustible decks. New and retro-fit.
2. DynaGlas FR or DynaKap FR over combustible or noncombustible decks. New and retro-fit.

### UL Fire-Rated Assemblies
UltraGard is also listed by Underwriters Laboratories, Inc. for use in fire-rated assembly design numbers P225, P230, P232, P243, P508, P510, P514, P701, P710, P713, P717, P718, P719, P729, P801, P815, P817, P818, P819 and P821. See current UL "Fire Resistance Directory."

### Federal Specifications
UltraGard meets the physical property requirements of Federal Specification HH-I-1972/Gen and HH-I-1972/2.

### Technical Data

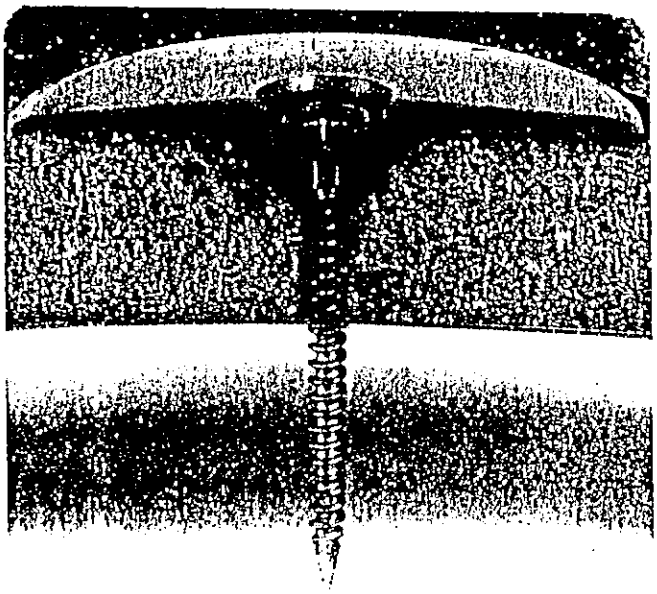
| Physical Properties | Values | Test Methods |
|---|---|---|
| Water Absorption, % by Vol— 2 hrs. | 1 max. | ASTM C 209 |
| Dimensional Stability Change 7 days @158°F, 90-100% RH Lengthwise<br>Crosswise | 4% max.<br>4% max. | ASTM D 2126 |
| Compression Resistance, 10% Consolidation, psi | 20 nom. | ASTM C 165 |
| Laminar Tensile Strength—psi | 4 min. | ASTM C 209 |

### For Use Over Metal Decks
The minimum thicknesses of UltraGard insulation over metal decks are as follows:

| Width of Rib Opening | Up to 2 1/2" max. | Up to 3 5/8" max. |
|---|---|---|
| Thickness of Insulation (Minimum) | 1.0" | 1.3" |

# UltraFast™ Fasteners

# Roof Insulation Mechanical Fastening



**Description**
A premium No. 12 hexhead roof insulation fastener coated with ClimaSeal® for superior corrosion resistance. UltraFast is required on all Schuller guaranteed systems using insulation over metal or other nailable decks. To be used with UltraFast Locking Plastic Plates or UltraFast Galvalume Metal Plates.

**Application.** UltraFast is used to attach the first or single layer of all insulation types to both metal or wood decks. (Striker Roof Insulation Fastener is available for concrete, and Gyptec is available for gypsum decks.)

**Sizes**

| Screw Length (Inches) | Insulation Range (Inches) (Top Flange) | Insulation Range (Inches) (Top or Bottom Flange) |
|---|---|---|
| 1 5/8 | 1/2 - 1 1/8 | |
| 2 1/4 | 1/2 - 1 3/4 | |
| 2 7/8 | 1 - 2 3/8 | |
| 3 1/4 | 1 - 2 3/4 | 1 - 1 1/4 |
| 3 3/4 | 1 - 3 1/4 | 1 - 3 3/4 |
| 4 3/8 | 1 5/8 - 3 7/8 | 1 5/8 - 2 3/8 |
| 5 | 2 1/4 - 4 1/2 | 2 1/4 - 3 |
| 6 | 3 1/4 - 5 1/2 | 3 1/4 - 4 |
| 7 | 3 1/2 - 6 1/2 | 3 1/2 - 4 |
| 8 | 4 1/4 - 7 1/2 | 4 1/4 - 6 |
| 10 | 6 1/4 - 9 1/2 | 6 1/4 - 8 |
| 12 | 8 1/4 - 11 1/2 | 8 1/4 - 10 |

**Advantages**
**Faster Application.** Hex washer head provides positive bit engagement for faster driveability. The X-point drills consistently through 18 gauge metal decks and also significantly increases drilling speed.

**Longer Life.** ClimaSeal coating exceeds the FM 4470 requirements for cycles of corrosion testing by 100%.

**Accurate Fastener Installation.** Hex washer head provides positive bit engagement providing straight drilling consistency.

**Technical Data**

| UltraFast Pullout Values In Metal |
|---|
| 26 Gauge/235 lbs. |
| 24 Gauge/330 lbs. |
| 22 Gauge/425 lbs. |
| 20 Gauge/496 lbs. |
| 18 Gauge/685 lbs. |
| 16 Gauge/874 lbs. |

**Note:** Test results obtained were under laboratory controlled conditions. Appropriate safety factors should be applied to these ultimate values by the customer.

| In Wood |
|---|
| 3/8" Thick/200 lbs. |
| 1/2" Thick/302 lbs. |
| 3/4" Thick/422 lbs. |

Figures based on A.C. exterior plywood, and will vary depending on the quality and type of wood.

UltraFast Ultimate Tensile Strength—1600 lbs.
UltraFast Ultimate Shear Strength—750 lbs.

**Applicable Standards**
Meets FM 4470 standards for Class I Insulated Steel Deck Construction. Also approved in Dade County, Florida.

# Manville

## SPM Fully Adhered EPDM Single Ply Roofing System

## Specification SE6A-(A)

## For use over Approved Decks or Manville Approved Insulations on Inclines up to 6" per foot

## For Regions 1, 2 & 3

**UL Classifications**

**Class A**

Max. Slope: 1"
Deck: Non-Combust.
Membrane: SPM 60FR
Insulation: UltraGard Gold, UltraGard Gold SP, Fesco Foam (Foam side up) or Wood Fiber

Max. Slope: 1/4"
Deck: Non-Combust.
Membrane: SPM 60W or SPM 60
Insulation: Fesco, UltraGard Gold, UltraGard Gold II, UltraGard Gold SP, Fesco Foam, overlaid with selected Wood Fiber

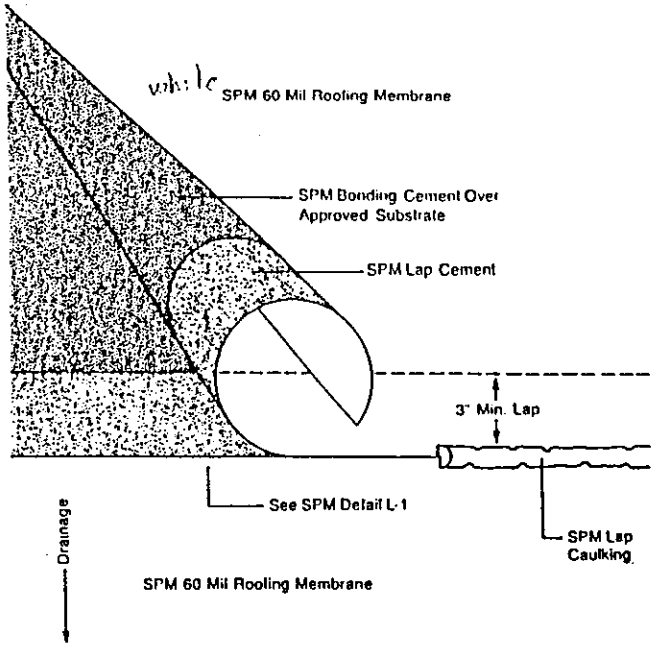
Max. Slope: 1"
Deck: Combustible minimum 15/32" Plywood
Membrane: SPM 60FR
Insulation: 1/2" Gypsum Barrier Board with Fesco Foam (Foam side up), UltraGard Gold, UltraGard Gold SP or selected Wood Fiber

**Class B**

Max. Slope: 1/4"
Deck: Combustible minimum 15/32" Plywood
Membrane: SPM 60 or SPM 60W
Insulation: 1/2" Gypsum Barrier Board with Fesco, Fesco Foam, Fes-Core or UltraGard Gold, UltraGard Gold II, UltraGard Gold SP, surfaced with 1" minimum, selected Wood Fiber

**Class C**

(See Class A&B)
SPM Color Coating is acceptable with all UL Classifications




### General

This specification is for use over any type of structural deck or existing roof construction that is suitable to receive a fully adhered membrane.

It is also for use over Fesco-Foam, UltraGard Gold, UltraGard Gold SP, 1/2" Retro-Fit or other approved roof insulations which offer a suitable surface to fully adhere the SPM membrane. Insulations should be installed in accordance with Manville Insulation Specifications 550, 552, 553, 554, or 556. Refer to the Manville Industrial/Commercial Roofing Systems Manual. It can also be used over Manville Recover Specifications RC-1, RC-2, RC-3, or RC-4.

**Design and Installation of the deck and/or substrate must result in the roof draining freely to outlets numerous enough and so located as to remove water promptly and completely. Areas where water ponds for more than 24 hours are unacceptable and will not be guaranteed.**

Note: All information contained in the current Manville Industrial/Commercial Roofing Systems Manual should be considered part of this specification.

### Flashings

Flashing details can be found in the Single Ply Membrane Products and Specifications Manual or the Manville Industrial/Commercial Roofing Systems Manual.

**Materials per 100 sq. ft. of Roof Area**

| | |
|---|---|
| SPM Membrane | 105 sq. ft. |
| SPM Bonding Cement | 1.7 gal. |
| SPM Color Coating | 1 gal. |

**Materials per 100 lin. ft. of Lap Area (3 in. lap)**

| | |
|---|---|
| SPM Lap Cement | 0.85 gal. |
| SPM Lap Caulking | 0.5 gal. |

Approximate installed weight: 37.5 - 40 lbs./sq.

### Application

Without stretching, unroll SPM Roofing Membrane over the approved substrate. Allow the membrane to relax for approximately 1/2 hour before bonding to substrate. Visually inspect the membrane for any flaws or damage which would interfere with acceptable application or performance of the membrane. Field laps to adjoining sheets must be constructed with the uphill sheet overlapping the neighboring sheet in a shingle manner to avoid any laps bucking natural drainage. Fold SPM-60 Roofing membrane back along the entire length so 1/2 of the underside is exposed, with the membrane smooth and free of wrinkles or buckles.

Apply SPM Bonding Cement to both the exposed SPM Roofing Membrane and the substrate at the rate of approximately 1 gal. per 60 sq. ft. of surface area (both surfaces). **Do not apply bonding adhesive to splice areas of the sheet.** Apply the SPM Bonding Cement evenly, with no globs or puddles, using a 9" plastic core paint roller. Allow the SPM Bonding Cement to dry until it is tacky but does not string or stick to a dry finger touch.

Roll the coated SPM Roofing Membrane into the adhesive on the substrate, avoiding wrinkles.

Set the SPM Roofing Membrane into the cemented area with a heavy roller or push broom to secure maximum contact of the two surfaces. Do not fully set any edges that are to lap over an adjoining sheet. Leave the last 12" folded back so that cleaning and lap cement may be applied.

Fold back the uncemented half of the SPM-60 Roofing Membrane and repeat steps as above. Again, avoid applying any SPM Bonding Cement to areas that are to be lap spliced.

After unrolling the subsequent sheet, position it to overlap the previous sheet by the amount of the specified lap width (a minimum of 3"), with sheet ends offset a minimum of 3'. Proceed in the same manner as described above.

**Lap Splicing**
Remove all release agent material from the lap areas of the folded back flap, and the top surface of the adjacent set sheet using clean, non linting rags with SPM Splice Cleaner or other approved solvent.

After thoroughly stirring SPM Lap Cement apply to both surfaces, using a three 3" or 4" x ½" thick paint brush at a rate of approximately 130-150 lin. ft. of 3" splice (coating both mating surfaces) per gallon (100' -120' for 4" lap). The cement should be brushed on with a conventional back and forth painting stroke (do not scrub in lap cement with a circular motion) obtaining 100% coverage on both mating surfaces; the cement coat must be smooth with no globs or puddles. Allow the cement to dry until tacky: it must not string or stick to a dry finger touch. After meeting the 'tackiness' test, an additional thumb push test is required to be certain the solvents are thoroughly flashed off and the cement is not just surface ready or skinned over. If the surface skin can be moved over the wet splicing cement underneath, allow the seam to dry longer.

Roll the top sheet toward the lap area until the cemented area is nearly touching the cement on the bottom sheet along the entire length of the lap. Allow the top sheet to fall freely into place avoiding stretching and wrinkling. Immediately roll the lap with a 2" wide steel roller, using positive pressure, toward the outer edge of the splice, and then roll along the entire length of the lap.

Apply a 12" x 12" x .060" uncured EPDM cover over all end lap, edge lap intersections ("T" joints) per flashing detail L-14.

Clean the lap edge, with Manville SPM Splice Cleaner or other approved cleaning solvent, extending at least 1" onto the top and bottom membranes. Apply a generous uniform bead of SPM Lap Caulking completely covering the lap edge. **Do not** feather the Lap Caulking with a pre-formed putty knife or trowel.

Manville recommends the application of SPM Lap Caulking application to be delayed on **all** laps until the day following the completion of the splice. The minimum delay before applying Lap Caulking is 4 hours.

**Perimeter Attachment**
The SPM membrane should be mechanically secured at all terminations and projections per Manville SPM Flashing Details.

**Surfacing (optional)**
If a color coating is desired, apply 2 coats of SPM Color Coating. Allow the newly adhered SPM Membrane to weather for a minimum of 2 weeks before the application of SPM Color Coating. Application of the SPM Color Coating should not commence until all other work on or over the roof surface is completed. The surface of the SPM Membrane should be dry, clean and free of any contaminants.

Mix the SPM Color Coating thoroughly so that it has a uniform consistency throughout the container. Apply 2 coats of the SPM Color Coating to the membrane surface with a 9" paint roller. Apply the first coat in a smooth uniform coat at the rate of approximately ½ gallon per 100 sq. ft. Apply the second coat in the same manner at the rate of approximately ½ gallon per 100 sq. ft. The second coat should be applied as soon as possible before the surface of the first coat becomes contaminated.