



Repairing & Recoating SPF Roofing Systems



Be Aware of Potential Liabilities

- Existing SPF roof and roof deck assembly
- Building code compliance
- Insurance approvals
- Compatibility of materials



Obtain Background Information

- Roof leakage history
- Height
- Wind loads
- Age and history of building
- Age and history of the roof system(s)
- Occupancy & use of building
- Insulation requirements
- Roof system warranty status



Exterior Inspection

- Exterior wall construction & condition
- Indication of settlement
- Condition of gutters, downspouts
- Condition of fascia
- Stains on walls
- Plant growth
- Indications of insect or animal damage.



Interior Inspection

- Roof deck type and condition
- Indications of roof leaks
- Severity and pattern of leaks
- Condition of roof deck support structure
- Condition of fasteners
- Location of plumbing, internal and overflow drains
- Interior climate (temperature and humidity)
- Asbestos or other regulated material



Roof Assembly Evaluation

- Roof assembly (decking & existing roof system sound & securely fastened
- Moisture saturated materials identified and removed
- Surface contaminants identified and removed



Visual Inspection

- Blisters, splits, cracks
- Damage from impact
- Type and condition of drainage system
- Evidence of ponding
- Evidence of structural movement
- Debris or vegetation
- Evidence of insect or animal damage



Inspect Gutters, Scuppers, & Drains

Check for :

- leaves/pine needles
- dirt
- granules

Check seals of:

- drains
- scuppers

Screens and strainers
in place





Inspect Rooftop Units & Penetrations

Check skylights

- fogged
- cracked
- broken
- leaking





Inspect Rooftop Units & Penetrations

Check for
chemicals or spills

- chemicals or materials should not be exhausted onto the roof.



Inspect Flashings, Edges, Expansion/Control Joints

- Masonry walls should be checked for moisture penetration and/or deterioration



Check for damage



Mechanical damage

BIRD
DAMAGE





Inspect Expansion Control Joints

Check expansion joints for signs of excessive movement.





Check for Poor Adhesion



POOR COATING ADHESION



Check for Poor Drainage



PONDING



Check for Pinholes



Inspect for Foam Cracks

- Check for foam cracks

Causes:

- structural settlement
- temperature change causing metal to expand and contract.





Inspect for Structural Movement Cracks





Inspect Masonry Walls and Caps

Check coping joints and metal flashing

- all coping joints to be caulked

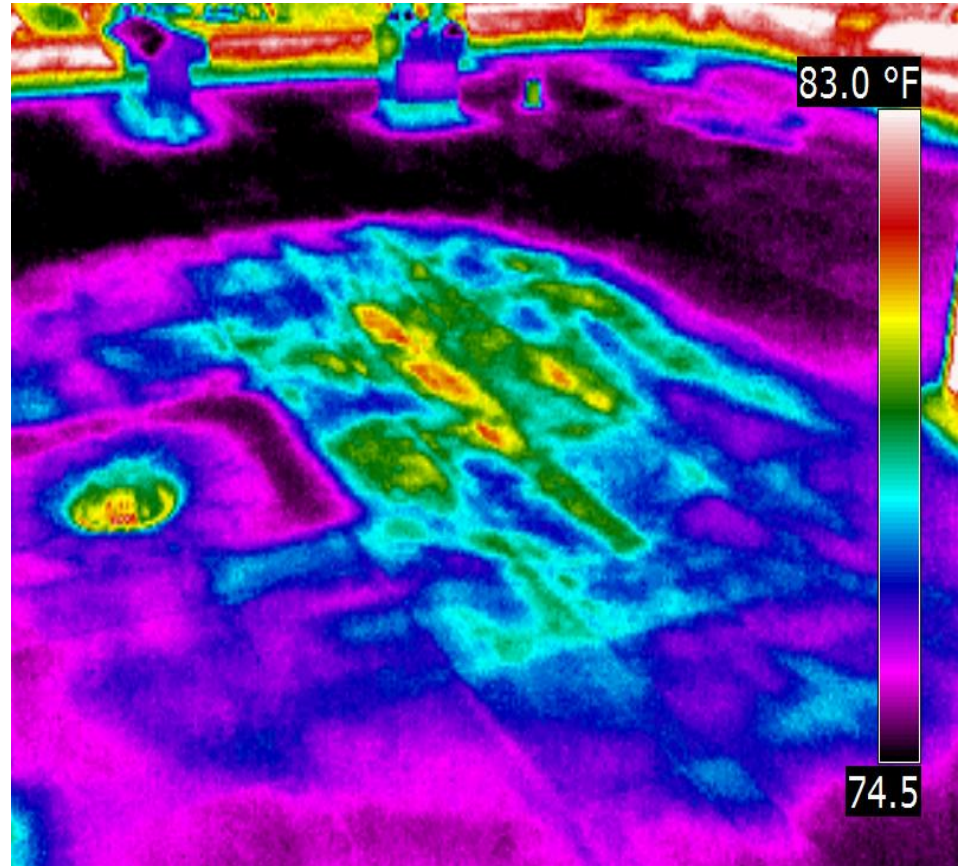
Does anyone see anything else wrong in this picture?





Physical Inspection

- Perform a moisture survey (non-destructive followed by moisture probe in suspect areas)





Wet foam being marked during survey for later repair





Tools

Sampling Tools



Temperature & humidity gauge



Depth gauges



Moisture meter



Optical Comparator





Samples

- Minimum 2 cores per roof section
 - 2" – 3" diameter
- one core per 10,000 sq ft
- Minimum 3 slit samples per roof section

or per 10,000 sq ft

1/2" Wide

2-3" Long

3/4" Deep

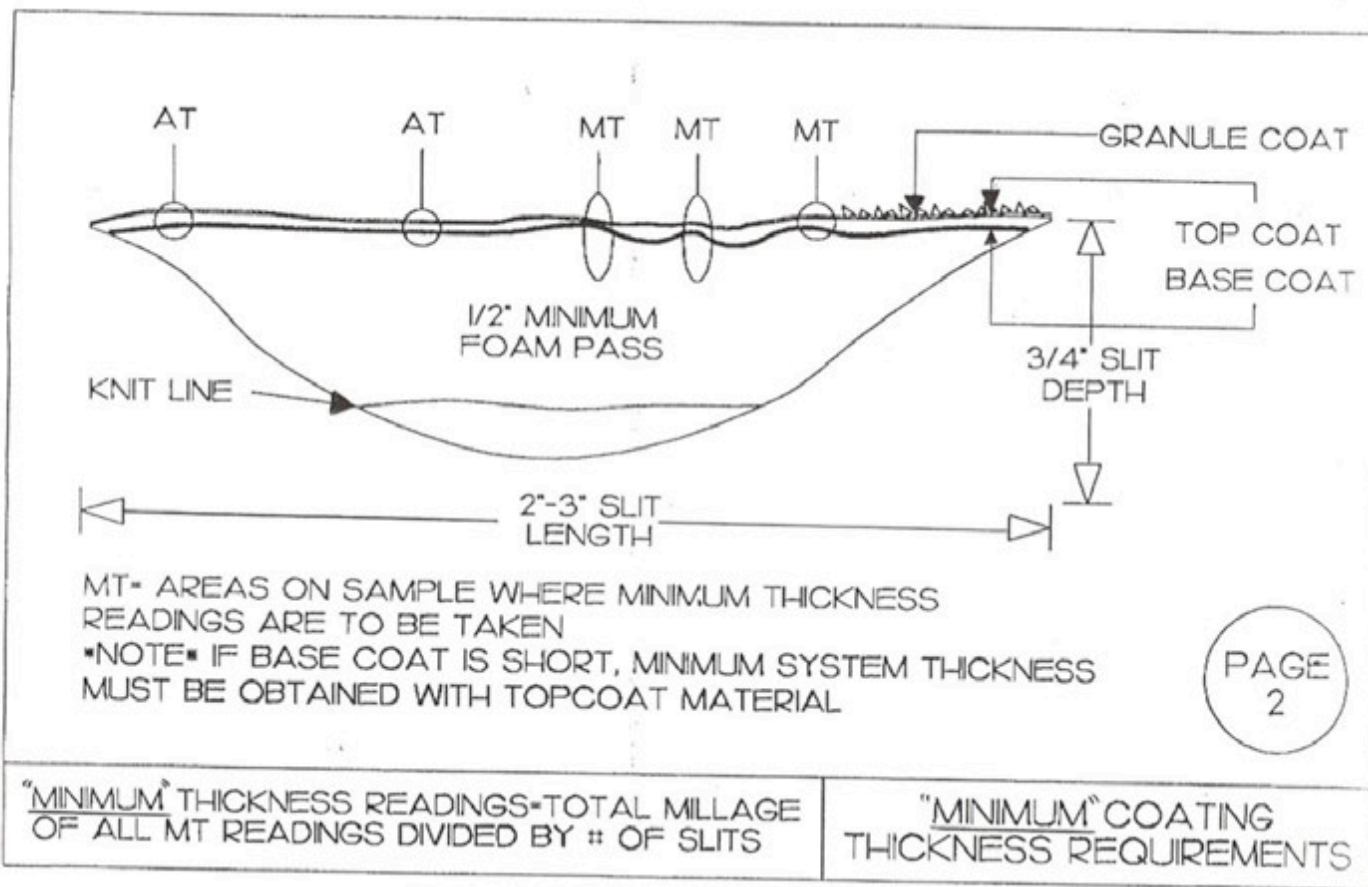




Slit Sample

- Obtain Samples from:
 - Field of the roof
 - Pass lines
 - Parapet wall, roof edge
 - Visible defects

Reading a Slit Sample





Slit Sample Analysis

- Total foam thickness
- Identify type of coating
- Coating thickness (base, middle, top coat)
- List Coating defects such as
 - Thin coating
 - Poor physical properties
 - Poor adhesion
 - UV degradation



Core Sample Analysis

- Total thickness of foam
- Number and thickness of foam lift
- Measure density and determine compressive strength
- List defects such as
 - UV Degraded Foam
 - Thin lifts
 - Poor adhesion
 - Poor cell structure
 - Off ratio



Roof Sketch

- Location of slit and core samples
- Areas of pinholes, uncured coating, blisters, mechanical damage
- Poor drainage
- Repairs needed to:
 - Foam stops, parapet walls, gutters, edges, expansion joints, counter-flashing, etc.
- Water saturated areas
- Sub-roof damage or deterioration
- Areas of special consideration
- Repairs needed to:
 - Vent pipes, drains, roof hatches, equipment curbs, guy wires, hot stacks, skylights, mechanical units, walkways, sleepers, pitch-pans, etc.



LEGEND

- S-1 SLIT SAMPLE LOCATION
C-A CORE SAMPLE LOCATION
FB FOAM BLISTER
IR IMPROPER REPAIR
EF EXPOSED FOAM
WF WET FOAM
PCA POOR COATING ADHESION
PW PONDED WATER
TC THIN COATING
MD MECHANICAL DAMAGE
⊕ ROOF DRAIN
① PHOTOGRAPH LOCATION

DEVIATIONS

- FOAM BLISTERS = 10 SF
IMPROPER REPAIRS = 10 SF
EXPOSED FOAM = 1 SF
WET FOAM = 5 SF
POOR COATING ADHESION = 2 SF
PONDED WATER = 100 SF
THIN COATING = 250 SF
MECHANICAL DAMAGE = 1 SF

FINAL ROOF SKETCH

**PROJECT FOAM
FOAM CITY, USA**

Job Number
1234567

Scale
NTS

Date
MM-DD-YY
Drawn By
XXX
Reviewed By
YYY
Drawing No.
1 OF 1



Selecting a Coating

- Perm rating required
- Compatibility with existing roof coating
- Manufacturer's or specifier's recommendation
- Environmental conditions
- Fire resistance & code or Insurance requirements
- Slope limitations
- Coating with successful field history in your climate
- Coating specifically designed for use with



Coating: Minimum Physical Properties

- 100% elongation
- 2000 hours accelerated weathering, no cracking or checking
- Passes mandrel low temperature flexibility test (- 15⁰ F) 2000 hours accelerated weathering
- 120 psi tensile strength



SPF Minimum Physical Properties

- 2.5 pcf
- 40 psi compressive strength
- 90% Closed cell content
- 75 Flame spread or less



Important considerations

- Aesthetics:
 - Color, surface profile, reflectivity, visibility
- Environmental Factors
 - Temperature extremes, wind, hail, chemical emissions
- Roof Top Traffic
 - HVAC servicing, mechanical maintenance
- Ease of Maintenance
 - Ability to repair or modify w/in-house staff;
 - Ability to be re-coated
- Codes and Insurance
 - Verify re-coating maintains required code and insurance approvals.



Repairing the SPF Roof for Recoat

- Repair small mechanical damage (less than 3") with sealant
 - Install sealant so surface is higher than surrounding area
 - Use sealant recommended by the coating manufacture
 - Ensure repair area is clean, dry and edges beveled
 - Foam cores may be use with sealant in some cases



Repairing the SPF Roof

- Remove blistered SPF
 - Use test cuts to determine cause and extent of problem.
 - Blister fields require removal of layers of foam that caused the blister (scarifying)
 - Individual blisters may be removed and refoamed
 - Cut blisters back at a 45 degree angle and remove coating from around the blister
 - Fill blister voids with SPF not coating or sealant



Repairing the SPF Roof

- Weather eroded foam and coating
 - Grind or scarf foam to expose clean, dry SPF
- Provide positive drainage
 - Install additional drains or scuppers
 - Build up low areas by applying additional SPF
- Repair or replace deteriorated flashing



Preparing the Surface

- Power wash with water
- Use environmentally safe detergent only if surface is not clean with water



- Do not use solvent

Surface Preparation

- Power wash with clean water after using detergent solution
- Test for chalking, power wash again if chalking still exists

Chalking



Surface Preparation

- Remove all non-compatible materials
 - Asphalt patches
 - Improper sealants
 - Roofing cement
 - Sheet membranes





Surface Preparation

- Prime?
 - Check with coating supplier
 - If primer is required apply same day as base coat
 - If in doubt:
 - Prepare 2 test patches one with primer and one without
 - Test adhesion after properly cured



Coating Application

- Inspect and clean the area to be coated
 - Remove the loose small pieces of debris that can interfere with a continuous seal of surface with coating.
 - While blowing the roof, look for pieces of debris stuck in the surface of the foam.
 - Cut out any small imperfections in the foam.
 - Because caulking repairs need to be cured before coating, it may be more practical to apply your base coat and repair the imperfections after the coating is cured.



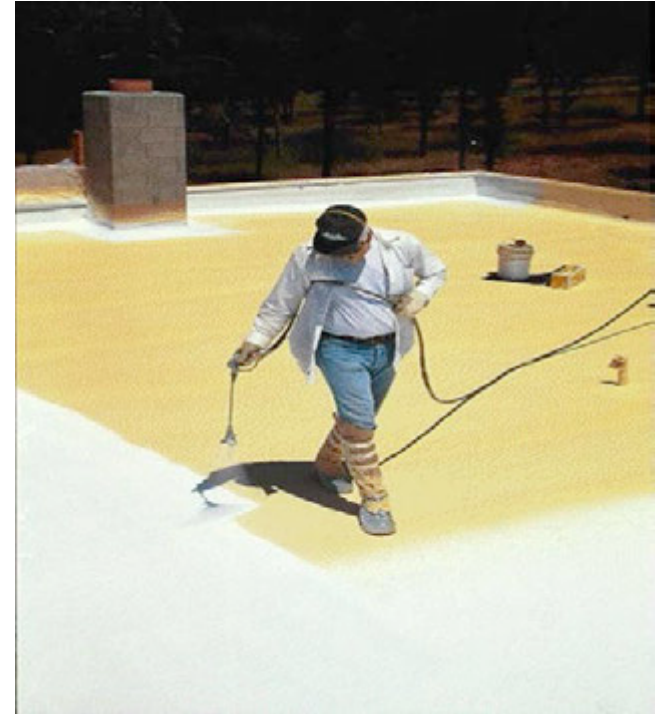
Coating Application

- Highly recommended in warmer, drier months
- Cooler temperatures retard curing and may increase moisture on roof surface
- Apply base coat at specified thickness
- Allow base coat to cure and measure coating thickness before applying top coat



Coating Application

- Spraying Techniques
 - Contrasting colors aid in uniform application.
 - Thinner and multiple passes may be required to achieve specified mils when excessive heat is present to prevent coating blisters.
 - Terminate a minimum of 2" past foam edge
 - Better productivity and more uniform dry film thickness when spraying using a crosshatch technique.





Coating Application

- Spraying Techniques
 - Install in straight lines with a 50% overlap.
 - Spray at 90 degree angle
 - Feather edges to prevent excess material build up.
 - Apply additional material to rough areas
 - Apply additional coating material on freshly shaved SPF. Don't spray a light pass of foam over it.
 - Base coat surface must be clean and dry before additional coats are applied



Coating Application

- Cross hatch subsequent coats
- Roll or brush coating at edges and other hard to coat places
- Triple coat edges and vertical surfaces



Quality Control Sampling

- Base Coat Sampling
 - Each base coat must be sampled. The base coating must be brought up to the specified thickness prior to any granule coat.
 - Once granules are installed, you can no longer effectively add coating at a rate less than 2 gals/ square.



Final Quality Control Inspection

- Obtain slit samples to verify thickness, quality and adhesion
- Verify sufficient coating on roof edges, drains, penetrations, vertical surfaces
- Verify termination lines on walls and penetrations are even and straight
- Check for coating defects
 - Adhesion
 - Pinholes
 - Uncured coating
 - Thin coating