

SECTION 07540  
ADHERED THERMOPLASTIC (PVC) MEMBRANE ROOFING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Work of this section shall include the furnishing of material and labor to install a complete adhered Thermoplastic roofing system including membrane, flashings and other components as may be required for a complete installation.

1.02 RELATED SECTIONS

- A. Section 07212 – Roof insulation
- B. Section 07565 – Roof Covering Removal and Preparation for Reroofing.
- C. Section 07900 - Joint Sealers

1.03 REFERENCES

- A. ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing".  
Classification: Type II, Grade I.

1.04 QUALITY ASSURANCE

- A. Manufacturer:
  - 1. Company specializing in manufacturing the roofing membrane specified in this Section with ten years of manufacturing experience.
- B. Installer:
  - 1. Roofing system shall be applied only by a Roofing Contractor authorized by Thermoplastic Roofing Membrane manufacturer prior to installation (Thermoplastic Roofing Membrane manufacturer "Contractor").
  - 2. Shall have at least five years experience in installing specified system.
  - 3. Upon completion of the installation and the delivery to Thermoplastic Roofing Membrane manufacturer by the Contractor of certification that all work has been done in strict accordance with the contract specifications and Thermoplastic Roofing Membrane manufacturer's requirements, a Thermoplastic Roofing Membrane manufacturer Technical Service Representative will review the installed roof system wherever a Standard or System warranty has been specified.
  - 4. There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Owner's Representative and Thermoplastic Roofing Membrane manufacturer.
  - 5. All work pertaining to the installation of Thermoplastic Roofing membrane and flashings shall only be completed by Contractor personnel trained and authorized by the Thermoplastic Roofing Membrane manufacturer in those procedures.

1.05 SUBMITTAL

- A. Product Data:
  - 1. Submit copies of roofing products Technical Information Sheets (TIS) for all products used on this project.
  - 2. Material Safety Data sheets
- B. Samples:
  - 1. Submit samples of roof membrane and fasteners.
- C. Application Information:

1. Submit copy of Roofing System application specification.
2. Submit copy of job related details including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, drains, and any other relevant details.

D. Warranty: Submit warranty sample.

E. Roofing system Manufacturer required pre-installation certificate if any.

F. Drawings:

1. Submit manufacturers shop drawing for tapered insulation.
  - a. Shop drawings shall show complete layout of the tapered system and shall comply with the drainage patterns required. Only the manufacturer's tapered insulation shop drawings will be acceptable.

#### 1.06 REGULATORY REQUIREMENTS

A. Conform to applicable local building code requirements.

B. Factory Mutual Research Corporation (FM) - Norwood, MA: Class 1-60 (required for most situations)

C. Underwriters Laboratories, Inc. - Northbrook, IL: Class A assembly

#### 1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers dry, undamaged, seals and labels intact and legible.

B. Store all materials clear of ground and moisture with weather protective covering.

C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability

D. Store roof insulation in weather protected environment; keep dry during application..

E. As a general rule all adhesives shall be stored at temperatures between 40 degree F (5 degree C) and 80 degree F (27 degree C). Read instructions contained on adhesive canister for specific storage instructions.

F. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

#### 1.08 ENVIRONMENTAL REQUIREMENTS AND JOB CONDITIONS

A. General:

1. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice.
2. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application. Consult Manufacturer's Technical Specifications on cold weather application.
3. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

B. Work under adverse weather conditions may only be allowed after consultation with and securing of written approval from Thermoplastic Roofing Membrane manufacturer.

- C. Install only the amount that can be made weathertight each day, all flashing and detail work in the installed new roof area shall be completed on the same day. All seams shall be heat welded before leaving the job site that day.
- D. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Contractor shall provide the necessary equipment to dry the surface prior to application.
- E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- G. Take measure to address incompatibility between thermoplastic roofing products and asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Incompatible materials shall not remain in contact with Thermoplastic Roofing membranes. Contractor shall consult Thermoplastic Roofing Membrane manufacturer regarding compatibility, precautions and recommendations.
- H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Contractor shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over roofing felt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.
- I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air or similar methods.
- J. The Contractor shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.
- K. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, where found shall be reported to Owner immediately. Cease work where such materials are found.
- L. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Contractor and properly transported to a legal dumping area authorized to receive such material.
- M. The Contractor shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.
- N. Consult Thermoplastic Roofing Membrane manufacturer for precautions regarding installation over coal tar pitch or a resaturated roof requiring special consideration to protect the Thermoplastic Roofing membrane from volatile fumes and materials.
- O. Verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Contractor shall report any such blockages in writing (letter copy to Thermoplastic Roofing Membrane manufacturer) to the Owner's Representative for corrective action prior to the installation of the Thermoplastic Roofing Membrane manufacturer roof system.

- P. Contractor shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner of such condition in writing for correction at the Owner's expense (letter copy to Thermoplastic Roofing Membrane manufacturer).
- Q. The Contractor shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values.
- R. The Thermoplastic Roofing membrane shall not be installed under the following conditions without consulting Thermoplastic Roofing Membrane manufacturer's Technical Dept. for precautionary steps:
  - 1. The roof assembly permits interior air to pressurize the membrane underside.
  - 2. Any exterior wall has 10 percent or more of the surface area comprised of opening doors or windows.
  - 3. The wall/deck intersection permits air entry into the wall flashing area.
- S. Precautions shall be taken when using adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.
- T. Thermoplastic Roofing membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.

#### 1.09 WARRANTY

- A. Type/Term:
  - 1. Provide 30-year Manufacturer's Roofing total System Warranty. Warranty shall include membrane, roof insulation, membrane accessories and metal edging.
- B. Coverage:
  - 1. Warranty:
    - a. Limit of liability: No Dollar Limitation
    - b. Scope of coverage: Repair any leak in the Thermoplastic Roofing Membrane Roofing System caused by the ordinary wear and tear of the elements, punctures, rooftop service traffic, manufacturing defect in Manufacturer's materials and the workmanship used to install these materials.

#### PART 2 PRODUCTS

##### 2.01 ACCEPTABLE MANUFACTURERS

- A. Sika Sarnafil (or Sarnafil): 16614 W. 158 St., Ste 303, Lockport, IL 60441.
- B. GAF: 900 S. Frontage Road - Suite 350, Woodridge, IL 60517
- C. Dow Roofing Systems, LLC: Nine Sullivan Road, Holyoke, MA 01040-2800

##### 2.02 MEMBRANE MATERIALS

- A. Sarnafil Thermoplastic Roofing 10G410-20, 30 year thermoplastic membrane with fiberglass reinforcement.
  - 1. Membrane thickness: 80 mil (2.0 mm), Membrane manufacturer is to certify that the polymer thickness is of the polymer thickness specified. Certification is to be signed by the membrane manufacturer's quality control manager. ASTM +/- tolerance for membrane thickness is not accepted.
  - 2. Color: EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 (ENERGY STAR listed).

## 3. Physical Properties - As shown in the following table:

| <u>Parameters</u>   | <u>ASTM<br/>Test Method</u>                     | <u>ASTM D-4434<br/>Spec.<br/>Requirement</u> | <u>Typical Physical<br/>Properties</u> |
|---|---|--|--|
| Reinforcing Material  | -   | -  | Fiberglass                             |
| Overall Thickness(1), min., inches (mm)                     | D638  | 0.045 (1.14)                                 | 80 Mil                                 |
| Thickness Above Scrim                                       | -   | -  | 0.023 (avg.)                           |
| Tensile Strength, min., psi (MPa)                           | D638  | 1500 (10.4)                                  | 1600 (11.1)                            |
| Elongation at Break, min. (machine / transverse)            | D638  | 250% / 220%                                  | 250% / 220%                            |
| Seam strength(2), min. (% of tensile strength)              | D638  | 75   | 80                                     |
| Retention of Properties After Heat Aging                    | D3045   | -  | -                                      |
| Tensile Strength, min., (% of original)                     | D638  | 90   | 95                                     |
| Elongation, min., (% of original)                           | D638  | 90   | 90                                     |
| Tearing Resistance, min., lbf (N)                           | D1004   | 10 (45.0)                                    | 14 (63.0)                              |
| Low Temperature Bend, -40° F (-40° C)                       | D2136   | Pass   | Pass                                   |
| Accelerated Weathering Test (florescent light, uv exposure) | G154  | 5,000 Hours                                  | 10,000 Hours                           |
| Cracking (7x magnification)                                 | -   | None   | None                                   |
| Discoloration (by observation)                              | -   | Negligible                                   | Negligible                             |
| Crazing (7x magnification)                                  | -   | None   | None                                   |
| Linear Dimensional Change                                   | D1204   | 0.10 % max.                                  | 0.02%                                  |
| Weight Change After Immersion in Water                      | D570  | ± 3.0% max.                                  | 2.5%                                   |
| Static Puncture Resistance, 33 lbf (15 kg)                  | D5602   | Pass   | Pass                                   |
| Dynamic Puncture Resistance, 7.3 ft-lbf (10 J)              | D5635   | Pass   | Pass                                   |
| Initial Solar Reflectance                                   | E903  | -  | 0.83                                   |
| Emissivity  | E408, C1371,<br>Other                           | -  | 0.90                                   |
| Solar Reflective Index (SRI)                                | E1980   | -  | 104                                    |
| Recycled Content (5 & 10 ft. sheets only)                   | 8 to 12% Pre-Consumer / Up to 1% Post Consumer. |  |  |

## Notes

- (1) Typical Physical Properties data is applicable for 0.048 in (1.2 mm) membrane thickness and greater.  
(2) Failure occurs through membrane rupture not seam failure.

B. Approved Equals: Prior written approval. See Section 01600 Product Requirements.

## 2.03 FLASHING PRODUCTS

- A. Membrane for vertical surfaces: .Sarnafil Thermoplastic Roofing G410-15 60 mil (1.5 mm)
- B. Miscellaneous Flashing: Sarnastack, 0.048 inch (48 mil/1.2 mm) thick Thermoplastic Roofing G410 membrane.
- C. Roof drain insert: Sarnadrain-RAC, PVC-coated, heavy-duty aluminum roof drain insert that mechanically seals to the drainpipe interior, made of 0.080 inch (2 mm) thick 6063 aluminum with a urethane seal.
- D. Sarnacircle-"G": Circular 0.048 inch (48 mil/1.2 mm) thick G410 membrane patch welded over T-joints formed by overlapping thick membranes.
- E. Sarnacorners – Universal Prefabricated outside and inside flashing corners made of 0.060 inch (60 mil/1.5 mm) thick membrane that are heat-welded to membrane or Sarnaclad base flashings.

- F. Open Post Flashing: Prefabricated post flashing, 0.048 inch (48 mil/1.2 mm) thick, with an open seam used to flash obstructed rooftop conduits and pipes 1/2 to 1-1/4 inch (12.7-31.8 mm) in diameter. Open Post Flashings shall be heat welded in place and terminated at the top of the penetration completing the pipe penetration detail.
- G. Sealant: Sikaflex-1a Sealant
- H. Pitch pocket filler: Thermoplastic Roofing Ier - A two-component urethane adhesive.
- I. Flashing attachment adhesive: Sarnacol 2170 Adhesive, and Sarnacol 2170 VC solvent-based, low VOC Adhesive.
- J. Separation felt: Sarnafelt - A non-woven polyester or polypropylene mat cushion layer that is necessary behind G410 or G459 Flashing Membrane when the flashing substrates are rough or incompatible with the flashing membrane.

2.04 INSULATION PRODUCTS

- A. Sarnatherm - Atlas ACFoam-IV A rigid isocyanurate foam insulation composed of a closed cell polyisocyanurate foam core laminated to a high performance coated glass facer. Two layers of 1.5 inch each for a total of 3 inches thick.
- B. Also see Section 07217

2.05 ATTACHMENT COMPONENTS

- A. Membrane Adhesive: Sarnacol 2121 Adhesive - A water-based adhesive used to attach the membrane to horizontal or near-horizontal substrates. Application rates are as follows:

| SARNACOL 2121 APPLICATION RATES FOR BARE BACK MEMBRANE |  |   |          |   |             |  |
|--|--|---|----------|---|-------------|--|
|  | Adhesive Rates – Gallons per 100 Square Feet<br>(Liters per Meter <sup>2</sup> ) |   |          |   |             | Approximate<br>Sq. Ft./Pail<br>(meter <sup>2</sup> ) |
|  | Substrate  |   | Membrane |   | Total       |  |
| Isocyanurate Paper Facer                               | 1.50 (0.61)  | + | 0        | = | 1.50 (0.61) | 333 (30.94)  |
| Smooth Plywood   | 1.50 (0.61)  | + | 0        | = | 1.50 (0.61) | 333 (30.94)  |
| GP DensDeck Prime                                      | 1.25 (0.51)  | + | 0        | = | 1.25 (0.51) | 400 (37.16)  |
| USG Securock Gypsum-Fiber                              | 2.00 (0.81)  | + | 0        | = | 2.00 (0.81) | 250 (23.23)  |

Notes:

There is a significant increase in drying time due to an increase in humidity or a decrease in temperature. Do not install when outdoor or substrate temperatures during drying period are expected to fall below 40 degree F (5 degree C).

Do not allow adhesive to skin-over or surface-dry prior to installation of membrane.

Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.

- B. Fasteners: Sarnafastener #12, HD and Sarnaplate-HD/CD or other Sarnafil approved fastening products suitable for the specified membrane and insulation.

2.06 PRIMER: Sarnafil products as recommended by membrane manufacturer for appropriate applications.

2.07 VAPOR BARRIER: Sarnavap-10- A 10 mil (0.25 mm) thick polyethylene vapor barrier/air barrier.

2.08 MISCELLANEOUS ACCESSORIES AND MATERIALS: Provide miscellaneous products such as sealants, fasteners, nailers etc. for a complete installation of the roofing system.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that removal of existing roofing materials is complete.
- B. Examine roof deck to determine that it is sufficiently rigid to support roofers and their mechanical equipment and that deflection will no strain or rupture roof components or deform deck.
- C. Verify that surfaces and site conditions are ready to receive work. The surface must be clean, dry, smooth, free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the membrane. All roughened surfaces, which could cause damage, shall be properly repaired before proceeding. Correct defects in the substrate before commencing with roofing work. All surface voids of the immediate substrate greater than 1/4" wide must be properly filled with an acceptable insulation or suitable fill material
- D. Examine roof substrate to verify that it is properly sloped to drains.
- E. Start work with sealants and adhesives at 60° - 80° F.
- F. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Appropriate measures must be taken to assure that fumes from adhesive solvents are not drawn into the building through air intakes.

### 3.02 PROTECTION OF OTHER WORK

- A. Protect metal, glass, plastic, and painted surfaces from adhesives and sealants.
- B. Protect neighboring work, property, cars, and persons from spills and overspray from adhesives, sealants and coatings and from damage related to roofing work.
- C. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trade.

### 3.03 VAPOR RETARDER

- A. Where applicable install vapor barrier per manufacturer's instructions.

### 3.04 ROOF INSULATION INSTALLATION

- A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- B. Seal deck joints, where needed, to prevent bitumen drippage.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly fit insulation to all penetrations, projections, and nailers. Insulation shall be fit tightly, with gaps not greater than 1/4". All gaps greater than 1/4" shall be filled with acceptable insulation. Under no circumstances shall the roofing membrane be left unsupported over a space greater than 1/4". Tapered insulation shall be installed around roof drains so as to provide proper slope for drainage. Miter roof insulation edges at ridge, valley and other similar non-planar conditions.
- E. When installing multiple layers of insulation, all joints between layers shall be staggered at least 6 in.
- F. Install fasteners to avoid conduits and other possible piping in and under the deck.
- G. Mechanical Attachment
  - 1. Insulation shall be mechanically fastened to the deck with approved fasteners and plates at a rate according to the insulation manufacturer's and Thermoplastic Roofing Membrane manufacturer's recommendations for fastening rates and patterns. The quantity and locations of the fasteners and plates shall also cause the insulation boards to rest evenly on the roof deck/substrate so that there are no significant and avoidable air spaces between the boards and the substrate. Each insulation board shall be installed tightly against the adjacent boards on all sides.
  - 2. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration into structural deck

recommended by the fastener manufacturer and Thermoplastic Roofing Membrane manufacturer.

3. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.

### 3.05 MEMBRANE PLACEMENT AND ATTACHMENT

#### A. Adhesive Applied Membrane Installation:

1. Over the properly installed and prepared substrate, Sarnacol 2121 adhesive shall be poured out of the pail and spread using notched 1/4 x 1/4 x 1/4 inch (6 x 6 x 6 mm) squeegees.
2. The adhesive shall be applied at a rate according to Thermoplastic Roofing Membrane manufacturer requirements (no adhesive is placed on back of the membrane). The formation of a film on the surface of the adhesive shall not be allowed to occur.
3. The membrane shall be carefully unrolled into the wet adhesive while the edges are overlapped 3 inches (75 mm). T
4. he membrane shall be pressed firmly into the adhesive layer with a water-filled, foam-covered lawn roller by frequent rolling in two directions.
5. Notes:
  - a) Sarnacol 2121 shall not be used if temperatures below 40 degree F (5 degree C) are expected during application or subsequent drying time.
  - b) No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner.
  - c) Sarnacol 2121 shall not be used on vertical surfaces or sloped surfaces greater than a 2 inch (50 mm) rise per 1 horizontal foot (0.3 m).

#### B. Hot-Air Welding Of Seam Overlaps

1. General
  - a) All seams shall be hot-air welded. Seam overlaps should be 3 inches (76 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.
  - b) Welding equipment shall be provided by or approved by Thermoplastic Roofing Membrane manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Thermoplastic Roofing Membrane manufacturer Technical Service Representative prior to welding.
  - c) All membrane to be welded shall be clean and dry.
2. Hand-Welding
  - a) Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
  - b) The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
  - c) The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch (20 mm) wide nozzle shall be used.
3. Machine Welding
  - a) Machine welded seams are achieved by the use of Thermoplastic Roofing Membrane manufacturer's automatic welding equipment. When using this equipment, Thermoplastic Roofing Membrane manufacturer's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable

generator is recommended. No other equipment shall be operated simultaneously off the generator.

- b) Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

4. Quality Control of Welded Seams

The Contractor shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark gray material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Contractor at locations as directed by the Owner's Representative or Thermoplastic Roofing Membrane manufacturer's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Contractor at no extra cost to the Owner.

3.06 MEMBRANE FLASHINGS

- A. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Thermoplastic Roofing Membrane manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Contractor's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- B. Reinstall existing metal coping and counterflashing removed during existing roof removal operations and stored for installation, examined products for damages and replace as required, complete with application of sealant.

3.07 TEMPORARY CLOSURE

- A. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system are the responsibility of the contractor. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed as required by the manufacturer
- B. Correct identified defects or irregularities.

3.09 CLEAN-UP

- A. Clean all contaminants from building and surrounding areas.
- B. Remove trash, debris, equipment from project site and surrounding areas.
- C. Repair or replace damaged building components or surrounding areas to the satisfaction of the building owner.

END OF SECTION