

SECTION 07 54 19
POLYVINYL CHLORIDE (PVC) ELAVLOY (KEE) ROOFING

1.1 SUMMARY

A. Section Includes:

1. Fully adhered PVC membrane roofing system with insulation over concrete deck.
2. Fully adhered PVC membrane roofing system without insulation over concrete deck.
3. Fully adhered PVC membrane roofing system with insulation over metal deck.
4. Pre-manufactured roof specialties.

B. Related Sections:

1. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
2. Division 07 Section "Building Exterior Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.2 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Bring conflicts between Specifications, Drawings, and the referenced documents to the attention of the Resident Engineer, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual or test designation in effect the date the Notice to Proceed with the Work is given.

B. American Society of Civil Engineers/Structural Engineering Institute:

1. ASCE/SEI 7-2005: Minimum Design Loads for Buildings and Other Structures

C. ASTM International:

1. ASTM C 1289-05 Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
2. ASTM D 1079-05a Terminology Relating to Roofing and Waterproofing
3. ASTM D 4263-83 (Reapproved 2005): Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

4. ASTM D 4434-04 Specification for Poly(Vinyl Chloride) Sheet Roofing
 5. ASTM D 5036-99 (Reapproved 2005): Practice for Application of Adhered Poly(Vinyl Chloride) Sheet Roofing
 6. ASTM D 6878-03 Specification for Thermoplastic Polyolefin Based Sheet Roofing
 7. ASTM E 108-05 Test Methods for Fire Tests of Roof Coverings
 8. ASTM E 119-05a Test Methods for Fire Tests of Building Construction and Materials
 9. ASTM E 1980-01 Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
- D. Bay Area Air Quality Management District (BAAQMD):
1. Regulation 8-51 - Adhesive and Sealant Products.
- E. Code of Federal Regulations
1. 40 CFR 59, Subpart D-2006: National Volatile Organic Compound Emission Standards for Architectural Coatings
- F. Cool Roof Rating Council (1738 Excelsior Ave.; Oakland, CA 94602; 866-465-2523; 510-485-7175; www.coolroofs.org)
1. CRRC-1-2005: Product Rating Program
- G. FM Approvals
1. FM Approvals 4470-1986 Approval Standard Class 1 Roof Covers (with 1987 and 1992 Supplements)
 2. RoofNav. Undated.
- H. FM Global:
1. FM Global Loss Prevention Data Sheet 1-28-2005: Design Wind Load
 2. FM Global Loss Prevention Data Sheet 1-29-2005: Roof Deck Securement and Above-Deck Roof Components
- I. National Roofing Contractors Association:
1. The NRCA Roofing and Waterproofing Manual. 5th ed. 2001 (Revised 2006).
- J. U.S. Department of Energy:
1. DOE Roof Products Qualified Product List. Undated.
- 1.3 DEFINITIONS
- A. Roofing Terminology: See ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 SYSTEM DESCRIPTION

A. Roofing Assembly with Insulation and Concrete Deck:

1. Recover board adhered to existing deck, if roofing manufacturer and Owner determine that a recover board is required due to the conditions of the existing concrete deck.
2. First layer of board insulation adhered to concrete deck.
3. Subsequent layers of board insulation, including tapered insulation where indicated, adhered to first layer.
4. Cover board mechanically fastened to insulation.
5. Fully adhered PVC membrane.
6. Flashings, counterflashings, metal termination bars, walkpads and other accessories.

B. Roofing Assembly with Insulation at Metal Deck:

1. First layer of board insulation mechanically fastened to the metal deck.
2. Subsequent layers of board insulation, including tapered insulation where indicated, adhered to first layer.
3. Cover board mechanically fastened to insulation.
4. Fully adhered PVC membrane.
5. Flashings, counterflashings, metal termination bars, walkpads and other accessories.

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
1. Fire/Windstorm Classification: Class 1-90 guidelines according to 2000-05 standards.
 2. Hail Resistance: MH.

- D. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist the factored design uplift pressures calculated according to SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems."
- E. Energy Performance Requirements: Provide Energystar compliant single ply roofing.
 - 1. Provide a membrane roofing system that complies with the following values for solar reflectance for white membranes when tested according to CRRC-1:
 - a. Reflectivity: 0.86, ASTM C 1549.
 - b. Emissivity: 0.86, ASTM C 1371.
 - c. Solar Reflection Index (SRI): 111, ASTM C 1980-01.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 - 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
 - 2. Roof insulation.
 - 3. Roof paver, full sized, in each color and texture required.
 - 4. Metal termination bars.
 - 5. Six insulation fasteners of each type, length, and finish.

1.7 INFORMATIONAL SUBMITTALS

- A. Quality Assurance Submittals:
 - 1. Qualification Data: For qualified Installer and manufacturer.
 - 2. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with performance requirements.

3. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
4. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.
5. Field quality-control reports.
6. Installer's letter of acceptance of roof deck and parapet substrates.
7. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

B. Project Closeout Submittals:

1. Maintenance Data: For roofing system to include in maintenance manuals.
2. Warranties: Sample of special warranties.

1.8 LEED SUBMITTALS

- A. Product Data for Credit SS 7.2: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement.
- B. Product Data for Credit EQ 4.1: For adhesives and sealants, including printed statement of VOC content.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is FM Approvals approved for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. Source Limitations: Obtain components including roof insulation fasteners and accessories for membrane roofing system from same manufacturer as membrane roofing.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.

1. Meet with Resident Engineer, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Inspect preparation for reroofing work.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 5. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
 6. Review structural loading limitations of roof deck during and after roofing.
 7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 8. Review governing regulations and requirements for insurance and certificates if applicable.
 9. Review temporary protection requirements for roofing system during and after installation.
 10. Review roof observation and repair procedures after roofing installation.
- F. Pre-installation Roofing Conference: Conduct conference at Project site.
1. Meet with Resident Engineer, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
 1. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
 2. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.11 PROJECT CONDITIONS

- A. Weather Limitations:
 1. Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

- A. Special Warranty:
 1. Roofing work subject to the terms of the Article "Warranty of Construction", FAR clause 52.246-21, except extend the warranty period as stated below.
 2. Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 3. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, roof pavers, and other components of membrane roofing system.
 4. Warranty Period: 20 years from date of Substantial Completion.
 5. Special Conditions Included in Warranty:

- a. Manufacturer shall pay all costs to replace or restore to its original condition all flat stock and tapered roof insulation that becomes moisture saturated due to leaks resulting from faulty materials or workmanship.
- b. Manufacturer shall pay all costs associated with replacement of rusted or otherwise defective "approved" fasteners.
- c. The warranty shall cover 100 percent replacement cost.
- d. There shall be no penal sum associated with this warranty.
- e. The Owner shall be able to make temporary repairs without voiding the warranty.
- f. Copies of the roof plan, details and specifications shall be attached to the warranty.
- g. There shall be no exclusions in the warranty for consequential damages.

B. Special Project Warranty:

1. Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PVC Roofing Membrane:

1. PVC sheet, white, as follows:
 - a. ASTM D 4434, Type III, fabric reinforced: 80 mils thick.
 - b. Sheet Flashing: Reinforced PVC.
 - c. Include cants, flashings, reglets and other accessories required for a complete installation.

B. Recover Board/Cover Board:

1. Recover Board: ¼ inch high density, closed cell polyisocyanurate foam board with clay-coated fiber glass facer having a minimum compressive strength of 150 psi, compatible for use with PVC membranes.
2. Cover Board: If the manufacturer's representative recommends the installation of a recover board as required by conditions of existing concrete deck, provide board recommended by roofing assembly manufacturer.

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard water-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
- D. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.

2.3 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway rolls, approximately 3/16 inch thick, and acceptable to membrane roofing system manufacturer.
 - 1. Color: Safety Yellow.

2.4 ROOF BOARD INSULATION

- A. General: Preformed roof insulation boards manufactured by PVC membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289-02 Type II, Class I, Grade 2, felt or glass-fiber mat facer on both major surfaces.

- C. Tapered Insulation: At locations indicated and where required, provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches, unless otherwise indicated.
 - 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain.
 - 2. Fabricate to slopes indicated, but provide a minimum slope for tapered insulation crickets of 1/2-inch per foot larger than roof slope.
- D. Insulation Accessories: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- F. Insulation Adhesive: Manufacturer's recommended modified asphalt, asbestos-free, cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.

2.5 PRE-MANUFACTURED ROOF SPECIALTIES

- A. Roof Edge Metal Systems: Pull-out resistance: Minimum 540 lbs. per lineal foot by SPRI Test Method RE-1, utilizing an extruded aluminum anchor bar and snap-on fascia cover.
 - 1. Factory Mutual "Approved" certification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 3. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

4. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
5. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
 1. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 SUBSTRATE BOARD

- A. General: Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
- B. Metal Deck: Mechanically fasten substrate board to deck to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.
 1. Fasten substrate board to top flanges of steel deck according to recommendations in FM Approvals' "RoofNav" and FM Global Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification
- C. Concrete Deck: If recommended by roofing manufacturer's representative as required by existing concrete deck conditions, install one layer of substrate board by adhering it to the substrate.
 1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. and allow primer to dry.
 2. Where indicated, set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.4 INSULATION INSTALLATION

- A. General: Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
 - 1. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
 - 2. Install tapered insulation under area of roofing to conform to slopes indicated.
 - 3. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
 - B. Roof Drains: Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - C. Lay-out: Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - D. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. and allow primer to dry.
 - 2. Where indicated, set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
 - E. Cover Board: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
 - 2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- 3.5 ADHERED MEMBRANE ROOFING INSTALLATION
- A. General: Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
 - 1. Install sheet according to ASTM D 5036.

2. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
 3. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- B. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
1. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
 2. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- C. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- D. Deck Drains: Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.6 BASE FLASHING INSTALLATION

- A. General: Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
1. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
 2. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
 3. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
 4. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.8 MANUFACTURED SPECIALTIES INSTALLATION

- A. Install in accordance with manufacturer's written instructions and Factory Mutual requirements.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
 - 1. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
 - 2. Additional inspections, at Contract's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Resident Engineer.
 - 1. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

3.11 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: <Insert name of Owner>.
 2. Address: <Insert address>.
 3. Building Name/Type: <Insert information>.
 4. Address: <Insert address>.
 5. Area of Work: <Insert information>.
 6. Acceptance Date: <Insert date>.
 7. Warranty Period: <Insert time>.
 8. Expiration Date: <Insert date>.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding 80 mph;
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction Contracts, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contract.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 074419