PACIFIC GROVE UNIFIED SCHOOL DISTRICT

PACIFIC GROVE HIGH SCHOOL ROOFING AND PAINTING PROJECT
Bid Number: D84-Rebid

ADDENDUM NO. 2

May 22, 2026

To: Prospective Bidders

The following changes, modifications, and additions to the Call for Bids for the Pacific Grove Unified School District Pacific Grove High School Roofing and Painting Project, Bid Number D84-Rebid are made a part thereof and are subject to all of the requirements thereof as if originally specified. Bidders must acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the bidder to disqualification.

The following Modifies the Deadline for Receiving Bids:

Call for Bids must be received prior to 11:00 a.m. on **June 9, 2026**.

The Following is Added to the Bid Specifications in the Call for Bids:

Notwithstanding anything to the contrary in the Call for Bids, bidders may submit Requests for Substitution for materials equivalent to the roof coating Weatherweld R-1P-16-45-A specified in the Call for Bids, with appropriate documentation to the District Office prior to 11:00 a.m. on May 27, 2026. The District will provide bidders with a response to any requests for substitutions for roofing materials by June 1, 2026.

Requests for substitution of "or equal" roofing materials shall include comparative spec-data of the specified material and the proposed substitution as set forth in the Contract Documents; requests without this information will be automatically rejected. Requests for substitution shall be submitted on the Owner's form, a copy of which is attached. Any such substitute materials shall meet or exceed the standards and requirements set forth in Board Resolution No. 1198.

Attachment:

PGUSD Substitution Request Form/Roofing

Resolution No. 1198

Date Posted: May 22, 2026

PGUSD SUBSTITUTION REQUEST FORM

ROOFING

We hereby submit for your consideration the following product in substitution of the specified item for the following project:

PROJECT NAME: Pacific Grove High School Roofing and Painting Project

BID NO. D84-Rebid

SPECIFICATION: Weatherweld R-1P-16-45-A

PROPOSED SUBSTITUTION:

Please submit with this form manufacturer literature to include warranty, product specification and data sheets for material substitutions to demonstrate conformance with the detailed requirements in the bid specifications.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

Contractor/Firm:_____

Contact Phone: (___) _____Contact email:_____

Name:_____Signature: _____

Title: _____ Date:_____

Signature shall be by a person who has authority to legally bind their firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

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1. Why can the original specification not be followed as written?

   _____

   _____

2. List any changes this substitution would cause including but not limited to schedule delays, additional scope requirements and/or additional materials:

   _____

   _____

3. Please indicate how the substitution is equal to or superior to the specification in quality:

   _____

   _____

PGUSD SUBSTITUTION REQUEST FORM

4. Please indicate how the substitution is equal to or superior to the specifications in durability:

_____

_____

5. Please indicate how the substitution is equal to or superior to the specifications in design:

_____

_____

6. Please indicate how the substitution is equal to or superior to the specifications in appearance:

_____

_____

7. Please indicate how the substitution is equal to or superior to the specifications in terms of performance of the intended function:

_____

_____

8. List similar projects where the substitution has been successfully utilized by your firm:

_____

_____

9. The scope of work has been prepared to ensure product compatibility and adherence to warranty requirements. Will the proposed substitution be compatible with the related products in the specification?

_____

_____

The District reserves the right to determine if a substitution is acceptable. The factors considered include but are not limited to uniformity, warranty, compatibility, quality, schedule, scope and application.

BEFORE THE GOVERNING BOARD
OF THE PACIFIC GROVE UNIFIED SCHOOL DISTRICT
MONTEREY COUNTY, CALIFORNIA

RESOLUTION NO. 1198
RESOLUTION REGARDING DESIGNATION OF A SPECIFIC BRAND OR TRADE NAME IN INVITATIONS TO BID AND REQUESTS FOR PROPOSAL (PUBLIC CONTRACT CODE §3400)

WHEREAS, the Pacific Grove Unified School District ("District") intends to provide a uniform system for the construction, maintenance and repair of its built-up-roof buildings throughout the District ("New System"); and

WHEREAS, the District currently utilizes multiple roofing systems manufactured by various providers throughout its District school sites and other facilities ("Existing Systems"); and desires to move toward a uniform roofing system for its built-up roof buildings, which is already in use at six (6) different sites; and

WHEREAS, pursuant to Public Contract Code sections 20111(b) and 22032, construction and maintenance projects exceeding applicable statutory limits must generally be put out to public bid;

WHEREAS, Public Contract Code section 3400(c) provides that the District may make a finding that is described in invitations for bids or requests for proposals for a construction project that a particular material, product, thing or service is designated by specific brand or trade name if doing so meets one or more particular purposes;

WHEREAS, the purposes identified in Public Contract Code section 3400(c) include the purpose of matching other products in use on a particular District public improvement either completed or in the course of completion;

WHEREAS, maximizing uniformity among certain products, materials things and services and related use of a particular brand or trade name can result in greater efficiency and cost savings to the District in many ways because the District is able to (1) match and/or integrate with products already in use, reducing the need for replacement of existing products; (2) stock a single model of replacement products or parts; (3) minimize inventory storage of parts; (4) make more cost effective purchases due to larger quantities; (5) standardize and reduce the cost of installation and use; (6) standardize maintenance, repair and cleaning; (7) reduce and make more uniform training for District staff on installation and use; (8) stockpile units for rapid replacement; (9) utilize standardized connections, such as cabling requirements for computers and system peripheral devices; and (10) determine interior finishes at the outset of project design, minimizing architectural design and redesign costs;

WHEREAS, the District wishes to use the Weatherweld Roofing System (see detailed descriptions of exemplar Weatherweld products attached as Exhibit A) for its upcoming Projects ("Project") to match other products already in use on District property, including but not limited to Pacific Grove High School (615 Sunset Ave), Pacific Grove Middle School (835 Forest Ave), Pacific Grove Adult School (1025 Lighthouse Ave), Forest Grove Elementary School (1065

Congress Ave), Robert Down Elementary School (485 Pine Ave) and the David Ave Campus (1004 David Ave), in order to obtain the benefits of product uniformity described above. The Weatherweld roofing system is available from multiple authorized dealers throughout the State of California.

NOW, THEREFORE, BE IT RESOLVED that the Board of Education hereby finds, determines and orders as follows:

1. The foregoing recitals are adopted as true and correct.

2. Use of each item set forth in Exhibit A on the Project is consistent with the purpose set forth in Public Contract Code section 3400(c)(2) and will help the District achieve the above-stated benefits of product uniformity.

3. Each invitation to bid or request for proposal that identifies particular materials, products, things or services by specific or brand name pursuant to the authority of this Resolution shall describe the findings set forth herein applicable to such particular materials, products, things or services.

4. The Superintendent and his designee are hereby authorized to take such other steps as are necessary to carry out the intent of this Resolution.

The foregoing Resolution was adopted at a meeting of the Governing Board of the Pacific Grove Unified School District on May 7, 2026, by the following vote:

AYES: 5
NOES: 0
ABSTAIN: 0
ABSENT: 0

Jennifer McNary
President, Board of Education
Pacific Grove Unified School District

CERTIFIED TO BE A TRUE
AND CORRECT COPY:

Beth Shamas
Clerk, Board of Education
Pacific Grove Unified School District

4920-6562-7811 v 1 docx

WEATHERWELD
ROOFING MADE SIMPLE

3-PART SPECIFICATION

This specification serves as a comprehensive document outlining the materials, methods, requirements, and quality assurance guidelines for a WeatherWeld roofing system. The document plays a crucial role in ensuring consistency, durability, and compliance with building codes and industry standards.

CONTRACTORS:

Reading and understanding this specification helps to ensure a successful and high-performing roofing installation.

CONTRACTOR – As a courtesy, we have highlighted critical areas of the document

But it is **your responsibility** to ensure that ALL project requirements are fulfilled, so be sure that you...

READ THIS ENTIRE DOCUMENT THROUGHLLY

Clarity and Standardization

The primary purpose of this specification is to provide clear guidelines for all parties involved in this project. Using the standardized CSI 3 Part format reduces miscommunication and errors during construction.

Material and Performance Requirements

This specification establishes detailed material and performance criteria, ensuring that the selected roofing system meets the project's needs. By setting these criteria, the specification helps project teams select high-quality materials that comply with local building codes and industry standards, such as ASTM International (ASTM), Underwriters Laboratories (UL), Factory Mutual Global (FM Global), and the National Roofing Contractors Association (NRCA).

Quality Control and Compliance

A well-defined roofing specification ensures that the installation process follows strict quality control measures to meet safety and performance expectations. It includes:

- *Pre-installation requirements (surface preparation, weather conditions, and material storage guidelines)*
- *Step-by-step installation procedures to ensure proper adhesion, fastening, and sealing.*
- *Testing and inspection protocols, such as fire resistance and wind uplift testing.*
- *Warranty requirements from manufacturers and contractors.*

By establishing these controls, the roofing specification helps prevent costly failures, such as leaks, material degradation, or structural damage.

Project Coordination and Accountability

A roofing specification clarifies roles and responsibilities, ensuring that architects, contractors, and manufacturers are aligned throughout the project. It provides:

- *A clear roadmap for contractors to follow during installation.*
- *Manufacturer-approved guidelines to ensure proper use of products and appropriate installation methods.*
- *A reference point for architects and engineers to verify compliance with design intent.*

The intent of this specification is to provide a clear, standardized, and detailed framework for designing and installing a high-quality roofing system. It ensures appropriate materials, code compliance, quality control, and project coordination.

WEATHERWELD
ROOFING MADE SIMPLE

SECTION 07 51 23

GLASS FIBER REINFORCED ASPHALT EMULSION ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Seamless Fluid Applied Composite Roof Systems.

B. Roof Flashings.

C. Roof Accessories.

1.2 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Cap flashing and expansion joints.

C. Section 07 71 00 - Manufactured Roof Specialties: Counter flashing, gravel stops, fascia, scuppers, gutters, and downspouts.

D. Section 07 72 00 - Roof Accessories.

E. Section 22 30 00 - Plumbing Equipment: Adjacent Piping Vents and Drains.

F. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 REFERENCES

A. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.

B. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM):
1. ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board.
2. ASTM C 1153 - Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging.
3. ASTM D 570 - Standard Test Method for Water Absorption of Plastics.
4. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
5. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
6. ASTM D 1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
7. ASTM D 2523 - Standard Practice for Testing Load-Strain Properties of Roofing Membranes.
8. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, and Fibered.
9. ASTM D 3909 - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules.
10. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

11. ASTM D 4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
12. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
13. ASTM E 548 - Standard Guide for General Criteria Used for Evaluating Laboratory Competence.
14. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. Underwriters Laboratories (UL):
   1. TGFU - Roofing Systems and Materials Guide.
   2. UL 790 - Standard Test Methods of Roof Coverings.
   3. UL 2218 - Impact Resistance of Prepared Roof Covering Materials

E. CRRC - Cool Roof Rating Council.

F. California Building Standards Code - Title 24.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual.

1.4 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to Work in this Section.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide watertight roofing membrane and flashing system that does not permit the passage of water, resists uplift pressures specified in this section, and is capable of withstanding thermally induced movement and exposure to weather without failure.

B. Energy Performance:
   1. Low-Slope Roofs: Provide a roofing system with Solar Reflectance Index not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
   2. Roof membrane finish must comply with current California Title 24 Part 6 requirements:
      a. Minimum three (3) year aged solar reflectance: 0.63.
      b. Minimum Thermal Emittance: 0.75.

C. Wind Resistance: Provide roofing membrane, base flashings and component materials that comply with requirements in FMG 4450, FMG 4470, UL 580 or UL 1897 as part of a membrane roofing system.
   1. Wind Load Resistance: 45 psf (1-90).

D. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings from the applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A in accordance with ASTM E 108 for application and roof slopes indicated.

1.6 SUBMITTALS

A. Submit in accordance with Section 01 30 00 - Administrative Requirements.

B. Product Data: For each product note in this section, submit printed or digital copies of the manufacturer's product information including the following:
   1. Printed affirmation of performance characteristics.
   2. Roofing system design.
   3. Application Instructions.
   4. Technical Data Sheets.
   5. Material Safety Data Sheets.

C. LEED Submittals:
   1. Product Data for Credit SS 7.2: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement.
   2. Product Data for Credit EQ 4.1: For adhesives and sealants, including printed statement of VOC content.

D. Anti-Collusion Affidavit: Submit affidavit that certifies that the bid proposal is genuine, not done in the interest of another person or entity, and that the Bidder has not 1.) conspired to create a falsified bid for comparative purposes, 2.) asked competitors to refrain from bidding, or 3.) conspired with competitive bidder(s) or manufacturer(s) to create an unfair advantage.

E. Installer Authorization: Provide an executed affidavit from the roofing system manufacturer that the Installer is in good standing and authorized to provide the Warranty specified in this section.

F. Project References: Provide verifiable references for no less than five (5) projects of the same size, scope and roofing system as the Work specified in this section.

G. Warranty Documents: Provide sample copies of the Manufacturer's standard form outlining the terms and conditions of the warranty specified for the Work in this section.

H. Shop Drawings: Provide plan, elevation, section, and isometric drawings outlining waterproofing conditions at transitions, terminations, penetrations and attachments to adjacent work.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of the roofing system.

J. Thermographic Roof Evaluation Reports: Where existing roofs are to remain in place and be encapsulated or "re-roofed", submit evaluation reports provided by a Certified Infrared Thermographer.

K. Research & Evaluation Reports: Include certifications from independent, third-party testing agencies such as Intertek, UL, ICC, FM or similar, stating the entire roofing system meets each of the performance characteristics listed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer must have no less than five (5) years' experience installing the type of roofing system specified in this section.
   2. Installer must be authorized by roofing system manufacturer to provide the manufacturer's full system warranty specified in this section.
   3. Installer shall not be the same business entity, a subsidiary of, or coupled with the roofing system manufacturer.

B. Manufacturer Qualifications:
   1. A roofing system manufacturer with no less than twenty (20) years of experience manufacturing roofing systems identical to the Work specified in this section.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Moisture Analysis: Where existing roofs are to remain in place and be encapsulated or "re-roofed", it is the responsibility of the contractor to perform a moisture analysis in accordance with ASTM C 1153 to determine suitability.

1.8 PRE-INSTALLATION CONFERENCE

A. Prior to commencement of Work, conduct a conference at project site. Comply with the requirements of Section 01 31 00 - Project Management and Coordination. Review and affirm methods and procedures related to the work specified in this section, including but not limited to the following:
   1. Meet with owner, 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 the 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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original containers, with seals unbroken, and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage. For bulk-delivered materials, identify manufacturer's name and product designation with delivery receipts and material manifests.

B. Protect roofing materials from physical damage and from deterioration due to sunlight, moisture, soiling and other sources. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

C. Store liquid materials in their original, undamaged containers in a clean, dry, and protected location, between 50 degrees F to 80 degrees F (10 degrees to 26.7 degrees C). Ensure jobsite storage is in a shaded and well-ventilated area, away from open flame or welding sparks. Indoor Storage is recommended.

D. Do not stockpile materials on roof without first obtaining acceptance from the Architect.

E. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

1.10 PROJECT CONDITIONS

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

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside Manufacturer's absolute limits.

C. The minimum temperature for application of WeatherWeld Emulsion and WeatherWeld Acrylic Coating is 50 degrees F (10 degrees C) and rising.

D. When ambient temperatures are above 100 degrees F (37 C), membrane application should be performed in two equal passes to ensure premature skinning does not occur.

E. Product application must not be performed when rain or other ambient moisture conditions such as fog or heavy dew are possible within 72-hours of completion. Roof surface must be a minimum of 6 degrees F (3 C) above the dew point and rising.

F. Safety Data Sheets (SDS) must be on location during transportation, storage, and application of materials.

G. Schedule and phase work such that new roofing materials are not subject to construction traffic. Protect new roof sections and inspect for damage upon completion.

H. When applying materials with spray equipment, take precautions to prevent overspray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles, or other property.

I. The surface on which the roof system is applied must be clean, smooth, dry, and free of projections or contaminants that could prevent proper application of or be incompatible with the new installation. Correct all sharp edges, foreign materials, oil, and grease.

J. Take precautions to ensure that materials do not freeze.

K. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.

1.11 WARRANTY

A. No Dollar Limit (NDL) Warranty: Provide Manufacturer's written and signed No Dollar Limit (NDL) warranty document, affirming coverage in the event of a leak in the roofing membrane or base flashings applied within the scope of work outlined in this section.
   1. Warranty Period: Forty (40) years from date of Substantial Completion.
   2. Coating Warranty: Twelve (12) years from date of Substantial Completion.

B. Project Warranty: Submit roofing installer's signed and executed warranty document affirming coverage of all work of this Section, including but not limited to insulation, cover board, fasteners, base sheet, roofing membrane, base flashings, and walkway products.
   1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Liquiform Technologies Inc – WeatherWeld.
   1. Within 7 days of the initial site visit, "or equal" roofing systems may be considered, provided the systems meet all performance requirements, physical characteristics and warranty duration specified in this document, and do not use solvents or fire during installation.

B. Acceptable Manufacturer(s): _____.

2.2 COMPOSITE MEMBRANE SYSTEM

A. General:
   1. Roofing system must comply with 2022 CBC, Chapter 15.
   2. Subject to compliance with requirements, provide the specified membrane configuration, applied over existing low slope roofs.

B. Basis of Design: R-1P-16-45-A, by WeatherWeld. Composite roof applied over existing gravel roofing with CA Title 24 compliant cool roof surface coating.
   1. Physical Properties:
      a. Total Weight: 2.23 pounds per square foot (1.01 kg) dry.
      b. Nominal Thickness: 375 mil Dry Film Thickness (DFT).
      c. Minimum Strength: 600 psi (4136 kN/m2) per ASTM D 2370.
      d. Minimum Elongation: 10% per ASTM D 4830.
      e. Minimum Puncture Resistance: 700 lb. (318 kg) per ASTM D 4830.
      f. Water Absorption: 1% max by weight per ASTM D 570.
      g. Fire Rating: UL Class "A" assembly.
   2. System Configuration:
      a. Flood Coat: 15 to 25 lbs. per 100 square feet as necessary to fully embed gravel such that all gravel is fully encapsulated by the asphalt emulsion.

2.3 COMPOSITE MEMBRANE MATERIALS

A. Asphalt Emulsion: Asphalt Emulsion meeting or exceeding the requirements of ASTM D 1227; WW471145, by WeatherWeld.
   1. VOC Content (Maximum): 0 g/l.
   2. Wet Weight: 8.7 Lbs./Gal. (1041 g/l).
   3. Dry Weight: 4.35 Lbs./Gal. (521 g/l).
   4. Solids Content by Volume: 49-53%.

B. Fiberglass Reinforcement (Type E): Multi-end continuous fiberglass roving designed for spray operations; WWFG100, by WeatherWeld.
   1. Yield: 207 yd/lb.
   2. Tex: 2400 g/km.
   3. Spool Weight: 41.9 LB (19kg).

C. Reflective Acrylic Coating: CA Title 24 Cool Roof Reflective Coating as supplied by the manufacturer of the membrane system; TRI-BUILT Roof-X-Tender 500, by QXO.
   1. Solids Content by Volume: 50%.
   2. VOC Content (maximum): <50 g/l.
   3. Weight: 10.4 lbs./Gal. (1246 g/l).
   4. Color: White.
   5. Solar Reflectance:
      a. Initial: 0.83.
      b. 3 Year Aging: 0.72.
   6. Thermal Emittance:
      a. Initial: 0.86.
      b. 3 Year Aging: 0.88.
   7. Solar Reflectance Index (SRI):
      a. Initial: 104.
      b. 3 Year Aging: 88.

2.4 SHEET MATERIALS

A. Detailing Membrane: with adhesive backing.
   1. Elongation: 85%.
   2. Thickness: 75 mils.
   3. Weight: 3 oz/ sq. yd.
   4. Roll Width: 6 inch and 12 inch.

2.5 ADHESIVES AND SEALANTS

A. Flashing Cement: Trowel grade SBS-modified flashing cement made from heavy-bodied asphalt reinforced with organic fibers.
   1. VOC Content (Maximum): 290 g/l.
   2. Weight per Gallon: 8.25 – 9.25 Lbs (988 – 1107 g/l).

B. Asphalt Primer: Asphalt based surface primer suitable for application on metal, masonry and concrete surfaces. Meets or exceeds the requirements of ASTM D 41.

C. Polyurethane Sealant: Moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant. Meets ASTM C 920, Type S, Grade NS, Class 35; Sikaflex-1A, manufactured by Sika.

2.6 SHEET METAL, FLASHING AND TRIM

A. Metal Flashing Sheet: 24 ga. galvanized sheet metal flashing.

B. Pre-Formed Edge Flashing: 24 ga. galvanized sheet metal flashing with a 1/2 inch (13mm) vertical "gravel stop" lip and. minimum 4 inch (102mm) roof mounting flange.

C. Flashing Collar: Pre-formed 24 Ga. galvanized sheet metal boot and collar for sealing single or multiple pipe penetrations.

D. Plumbing Stacks: 24 Ga. galvanized sheet metal flashing, or 4 lb (1.8kg) sheet lead formed, rolled and soldered.

E. One-Way Breather Vents: Heavy gauge spun aluminum vents which allow moisture and air to escape but not enter the roofing system.

F. Pitch Pans: 24 gauge galvanized sheet or 20oz (567gram) copper.

G. Drain Flashings: 24 gauge galvanized sheet, 20oz (567gram) copper, or 4 lb (1.8kg) sheet lead, formed and rolled,

H. Fabricated Flashings:
   1. Fabricated flashings and trim may be specified in Section 07 62 00.
   2. Fabricated flashings and trim must conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

I. Manufactured Roof Specialties:
   1. Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim may be specified in Section 07 71 00.
   2. Manufactured roof specialties must conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

2.7 WALKWAYS

CONTRACTOR – Confirm Requirements for walkways. Check if listed in Owner's RFP.

A. Foot Traffic Walkway Coating:
   1. Acrylic Coating: Fluid applied, single-component, 100% Acrylic, waterproof walking surface with ceramic granules designed to enhance the traffic resistance of the roof surface.
      a. Coating Properties:
         1) Tensile Strength: 350 psi when tested in accordance with ASTM D 412.
         2) Elongation: 174% when tested in accordance with ASTM D 412.
         3) Solids Content: 95% when tested in accordance with ASTM D 2369.
         4) VOC: <50 g/l.
         5) Flash Point: 141 degrees F min. (60.6 degrees C) when tested in accordance with ASTM D 93.
         6) Color: Safety Yellow.
      b. Granule Properties:
         1) Specific Gravity 2.65 when tested in accordance with ASTM C 128,
         2) Bulk Density: 90-100 lbs./Cu. Ft. when tested in accordance with ASTM C 29.
         3) Color: Yellow.

2.8 ACCESSORIES

A. General: Roofing accessories recommended by manufacturer for intended use and compatible with membrane roofing.

B. Cant Strips: 4" angled wood fiber strips meeting the requirements of ASTM C 728.

C. Tapered Edge Strips: Tapered wood fiber strips meeting the requirements of ASTM C 728.

D. Wood Nailers: Comply with requirements in Division 06 Section "Miscellaneous Carpentry."

E. Anti-Skid Granules: Granules specifically designed for anti-skid purposes and compatible with all coatings specified in this section.
   1. Specific Gravity 2.65 when tested in accordance with ASTM C 128,
   2. Bulk Density: 90-100 lbs./Cu. Ft. when tested in accordance with ASTM C 29.
   3. Color: As selected by Owner.

PART 3 EXECUTION

3.1 EXAMINATION

A. Compatibility, verify all materials including existing roof are compatible.
   1. Verify existing roof systems to be recovered are NOT coated with silicone style coatings.
   2. Verify existing roof systems to be recovered are NOT PVC single ply membrane.
   3. Verify the following for installations over lightweight insulating concrete (LWIC):
      a. Decks must be a minimum of 2 inches (51 mm) thick with a compressive strength of no less than 125 psi (0.86 MPa) and a density of 22 pcf (352 kg/sm).
      b. Slopes must not exceed 1 inch per foot (83 mm/m).
      c. Membrane and insulation may not be applied directly to lightweight concrete. Mechanically attach an approved specified base sheet prior to application of subsequent insulation or membrane.

B. Examine substrates, work areas and field conditions for compliance with the following requirements and other conditions which may affect the performance of the roofing system. Verify the following conditions:
   1. Surfaces are clean, rigid, dry, smooth, and free from cracks, holes, blisters, debris and sharp changes in elevation greater than 1/4 inch (6mm).
   2. The deck is free of depressions, waves or projections and properly sloped to drains, valleys, eaves, scuppers, or gutters.
   3. Roof openings and penetrations are adequately installed, and that roof drains are securely clamped in place.
   4. Cant strips, blocking, curbs and nailers are securely anchored and installed in accordance with manufacturers requirements.
   5. Drains and scuppers are free of ruptures and sealed on all four sides on the exterior face of walls.
   6. Surface plane flatness and fastening of roof deck complies with manufacturers requirements.
   7. Concrete curing compounds and any chemicals that may impair adhesion of roofing components have been removed.
   8. Existing roof assemblies are dry, confirmed by conducting infrared thermal scans.
   9. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method in accordance with ASTM D 4263.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Owner or Architect of unsatisfactory conditions before proceeding.

3.2 PREPARATION

A. Do not begin installation until all substrates have been properly prepared.

B. Prior to application, clean waterproof application surfaces with water. Where wash water must be reclaimed due to contamination concentrations, roof water collection design of the building or local ordinances. Conform to local requirements for disposal of wash water.

C. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation in accordance with the roofing system manufacturer's written instructions.

D. Remove or correct all sharp projections which may interfere with the integrity of the membrane.

E. Provide traffic paths, and erect barriers, fences, guards, rails, enclosures, chutes, and other measures to protect personnel, roofs and structures, vehicles and utilities.

F. Protect roof drains and edges during construction to prevent materials from entering roof drains and conductors or migrating onto surfaces of adjacent construction. Remove roof drain plugs when no work is taking place or when rain is forecast.

G. Protect adjacent materials and lower paving, prior to starting work, in accordance with roofing system Manufacturer's instructions.

3.3 EXISTING ROOF PREPARATION

A. General:
   1. Suitable roofs for recover must be free of dust, dirt, debris, and any contaminants which may affect the performance of the new roof. Areas of substantial deck deflection or membrane imperfections must be corrected prior to commencement of Work.
   2. Single-ply PVC roofing and silicone coatings are not suitable substrates. Remove the existing roof system in areas where either is present.
   3. Core sample test cuts must be performed to verify the construction and condition of the existing roof.
   4. Perform an infrared moisture scan in accordance with ASTM C 1153 to determine the suitability of existing roof systems to be encapsulated.
   5. Any existing substrates and insulation must be dry. Wet or deteriorated areas of insulation and substrate must be removed and replaced with new materials.
   6. Comply with local building codes where requirements exceed those listed.

B. Perimeter Flashings: Remove all existing perimeter edge flashings including coping caps, counterflashings and termination bars.

C. Encapsulation of Gravel Surfaced Built-Up Roofs:
   1. Surface Preparation:
      a. Remove loose gravel from existing roofs with the following procedure:
         1) Vacuum loose gravel.
         2) Power broom to agitate all loose particulates.
         3) Vacuum loose particulates to provide a clean, smooth surface.
   2. Polyester Leveling System: Where existing gravel exceeds 1/2 inch (13mm) in diameter, apply one layer of polyester ply embedded in emulsion at rate of 15 gal. of undiluted emulsion per 100 sq. ft (6.1 L/m^2).
      a. Both polyester ply and emulsion must be thoroughly saturated, creating a solid surface.
      b. Extend polyester leveling system to cover the entire embedded gravel roof area.
   3. Flood Coat: Where existing gravel is less than 1/2 inch (13mm) in diameter, apply a flood coat of emulsion at rate of 15 gal. of undiluted emulsion per 100 sq. ft (6.1 L/m^2).
   4. Comply with local building codes where requirements exceed those listed.

3.4 ROOF MEMBRANE INSTALLATION - GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA and NRCA.

B. Commence installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services during roofing system installation.

D. Coordinate installation to ensure that materials that will not be permanently exposed are protected from moisture and covered at the end of each workday.
   1. Provide tie-offs at the end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
   3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Substrate Joint Penetrations: Where exceeding 1/4 inch in width (6mm), tape joints with detailing membrane to inhibit roofing materials from penetrating substrate, entering building, or damaging roofing system components or adjacent building construction.

3.5 FLASHING INSTALLATION

CONTRACTOR – Review requirements for application around FLASHING DETAILS.

A. General:
   1. Refer to the manufacturer's application manual for flashing specific details.
   2. All flashings must have a minimum of 536 mil of fiberglass composite upon completion of the installation.
   3. Fabricated flashings and trim must conform to the requirements found in the current SMACNA "Architectural Sheet Metal Manual".
   4. Manufactured Roof Specialties: Manufactured copings, fascia, control joints, and related flashings and trim must conform to the requirements found in the SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractors Association "Roofing and Waterproofing Manual".

B. Surface Preparation:
   1. All wood surfaces must have a base sheet installed prior to flashing application. Fasten base sheet following the same method and pattern as the field application.
   2. All metal, concrete and masonry surfaces must be primed with ASTM D 41 primer prior to flashing application.
   3. Any joint in the structure intended to allow for movement must be divorced from the seamless reinforcement composite.
      a. Install an 18 inch (457mm) wide slip sheet consisting of inverted (mineral-side down) cap sheet, laid dry over the joint and extending 36 inches (914mm) at each end.
      b. Over the slip sheet, solidly adhere a 36 inch (914mm) polyester ply in 4 gallons per 100 square feet (1.63 L/m2) of emulsion and reinforce with 536 mil of seamless composite.
   4. Cant Strips: Minimum 3 inch (76mm) cant strips must be installed at base flashings, walls, and curbs. Miter cants at ends to provide a smooth transition and set in adhesive.

C. Perimeter Conditions
   1. Metal Drip Edges:
      a. Inspect nailers for proper attachment and configuration.
      b. Install the specified base sheet, extending and turning 1 inch (51mm) down the edge.
      c. Install continuous cleat and fasten at 6 inches (152 mm) on center.
      d. In recover applications where base sheet is not specified, adhere a continuous strip of self-adhering membrane to the eaves, 1 inch (25mm) down the vertical face and extending 5 inches (126 mm) onto the roof surface.
      e. Attach new metal edge to cleat, with 3/8" head roofing nails located less than 1 inch (25mm) from the interior edge of the flange, spaced every 3 inches (76 mm) on center.
      f. Apply primer to metal edges at a rate of 100 square feet per gallon and allow to dry.
      g. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the interior edge, extending 4 inches (102mm) onto the roof surface.
      h. Coordinate placement to ensure membrane laps do not coincide with metal laps.
      i. Reinforce with 500 mil of seamless composite. Extend the field application of composite to the outside edge of the metal flashing.
      j. Apply composite flush with the edge to ensure that water does not pond.
   2. Coping Caps:
      a. Attach tapered nailer to top of wall with a minimum slope of 1/4 per foot.
      b. Cover nailer and all exposed wood with detailing membrane, extending 2 inches (50mm) over edges.
      c. Reinforce with 500 mil of seamless composite. Extend field application of composite to the outside edge of wall.
      d. Install continuous cleat and fasten at 6 inches (152 mm) on center to outside wall.
      e. Install new metal coping cap hooked to continuous cleat.

f. Overlap joints a minimum of 4 inches (101 mm) and install in a 1/4 inch (6 mm) bed of polyurethane sealant.
g. Install 6 inch (152mm) strips of self-adhering membrane, extending 3 inches (76mm) onto each side of joint. Extend down front and back face of coping.
h. Fasten interior vertical face of coping cap 24 inches (609 mm) on center with approved fasteners and neoprene washers.

3. Surface Mounted Counterflashings:
   a. Set counterflashing in adhesive and fasten at 8 inches (203 mm) on center with approved fasteners and neoprene washers.
   b. Install sealant at top of counterflashing.
4. Recessed Counterflashings:
   a. Cut a receiver groove into concrete masonry unit wall located at the first horizontal grout joint above base flashing termination.
   b. Secure recessed "Reglet" type counterflashing with expansion fasteners.
   c. Install sealant at top of counterflashing.
5. Skirted Counterflashings:
   a. Skirted counterflashings must be approved by the Manufacturer prior to application.
   b. Where existing counterflashing does not adequately cover finished base flashings, a "skirt flashing" may be installed.
   c. Flashing must extend at least 1 1/2 inches (39mm) behind existing counterflashing and project no greater than 3 inches (76mm) past the bottom edge. Vertical seams must overlap a minimum of 6 inches (152mm).
   d. All metal edges which may come in contact the base flashing must be hemmed to protect the installed membrane.
   e. Mechanically fasten skirt flashing to existing counterflashing using self-tapping screws with neoprene washers.

D. Penetrations
1. Pipe Penetrations:
   a. Embed the prepared and primed galvanized pipe boot in a bed of asphalt roof cement, centering it over the pipe. Fasten at corners where insulation is not present.
   b. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
   c. Reinforce with 500 mil of seamless composite, extending to the top of the pipe boot.
   d. Apply sealant at gap between roof membrane and pipe.
   e. Install storm collar approximately one inch (25mm) above the top of the flashing and secure with a draw band and approved sealant.
   f. Where lead pipe flashings are specified, omit the storm collar and sealant, turning the metal downward and into the top of the pipe by at least 2 inches (51mm). Solder all joints
2. Pitch Pockets:
   a. Place the pitch pocket over the penetration and prime all flanges.
   b. Apply strips of self-adhering membrane around all sides of pitch pocket, extending 6 inches (152 mm) onto the field of the roof.
   c. Fill pitch pocket halfway with non-shrink grout.
   d. Encapsulate entire pitch pocket with 500 mil of seamless composite.
   e. Apply caulk joint between roof system and pitch pocket with roof cement.
   f. Place a water shedding bonnet over the top of the pitch pocket, clamp the top with a drawband, and apply sealant.
3. One-Way Relief Vents:
   a. On recover applications or where lightweight concrete roof decks are present, locate one-way aluminum moisture vents every 1000 sq ft.
   b. Remove existing roof to expose the uppermost substrate and allow a clean work area at least 6 inches from the edge of the flange.
   c. Core a 3 inch (76mm) hole through roof layers and insulation. Do not puncture any vapor barriers which may be present.

d. Prime the flange and embed the vent in a bed of asphalt roof cement, centering it over the opening.
e. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
f. Apply 500 mils of seamless composite to aluminum flange extending to the base of the vent, turning upward by at least 2 inches (51mm).

4. Heat Stacks:
   a. Apply roof system over the entire surface of the roof, sealing the base of the stack with sealant approved for use with high temperatures.
   b. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
   c. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
   d. Reinforce with 500 mil of seamless composite.
   e. Install new storm collar. Weld or install stainless steel draw brand and caulk.

E. Roof Drainage:
1. Roof Drains:
   a. Prior to commencing flashing work, plug drains to prevent debris from entering plumbing.
   b. Thoroughly clean all drains to receive roof membrane; prime with ASTM D 41 primer.
   c. Taper insulation towards drains to create a sump 24 inches (609 mm) from center of drain.
   d. Form 12 inch (305mm) detailing membrane into the drain bowl, extending from 3 inches (76mm) into the bowl, extending outward onto the prepared work surface.
   e. Set primed metal flashings (30 inch square minimum) in 1/4 inch bed of roof cement. Extend flashing into drain a minimum of 2 inches (50 mm).
   f. Reinforce with 500 mil of seamless composite extending down walls of drain bowl and allow to cure.
   g. Install clamping ring, remove drain plug and attach strainer.
2. Scuppers:
   a. Inspect nailers for proper attachment and configuration.
   b. Apply detailing membrane 1 inch (25mm) over the edge and assure coverage of all wood nailers.
   c. Install pre-formed and primed scupper in a 1/4 inch (6mm) bed of roof cement. All seams and corners must be soldered, and scupper must have a minimum 4 inch (101 mm) flange.
   d. Fasten scupper flange to nailers every 3 inches (76mm) on center.
   e. Adhere a continuous strip of detailing membrane to the metal flange approximately 2 inches (51mm) from the edge and 4 inches (152mm) onto the existing roof surface.
   f. Coordinate placement to ensure membrane laps do not coincide with metal laps.
   g. Reinforce with 500 mil of seamless composite. Extend the field application of composite to the outside edge of the metal flashing.
   h. Apply composite flush with the edge to ensure that water does not pond.
   i. scupper edge must be turned downward a minimum of 1 inch (25mm) at outside edge of wall and sealed.

F. Raised Curbs:
1. Mechanical Equipment Curbs:
   a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
   b. Reinforce with 500 mil of seamless composite. Extend field application of composite to the top of the curb.
   c. Install rooftop mechanical unit in accordance with its Manufacturers' recommendations.
   d. Where equipment is not self-flashing, install pre-manufactured counterflashing with fasteners and neoprene washers 6 inches (152mm) on center, embedded in a bead of sealant.
2. Skylights, Smoke Vents and Roof Hatches:
   a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.

b. Reinforce with 500 mil of seamless composite. Extend field application of composite to the top of the curb.
c. Install pre-manufactured unit in accordance with its Manufacturers' recommendations.
d. Where required by local code, install OSHA compliant, compression mounted skylight protection screens per skylight manufacturers' written instructions.

G. Rooftop Equipment and Accessories:
1. Pipe and Equipment Supports: Install supports in accordance with Manufacturers' guidelines. Traffic pads must be installed under pipe supports and fasteners must not penetrate the roofing membrane.
a. All pipes 2 inches (51mm) in diameter or less may be supported with polymer pipe supports spaced no greater than 8 feet (2438mm) on center.
b. All pipes over 2 inches (51mm) in diameter must be supported with movable pipe hangers or other support system approved by the roofing system Manufacturer.

H. Roof Transitions and Area Dividers
1. Steep-Sloped Roof Transitions: Remove roofing material a minimum of 24 inches (610mm) onto adjacent steep-slope roofs which drain onto the roof in this section.
a. Install self-adhering base sheet, extending 12 inches (304mm) onto low slope roof and 24 inches (609mm) onto steep slope roof.
b. Reinforce with 500 mil of seamless composite.
c. Install steep slope roofing material beginning no less than 12 inches (305mm) from the center of the roof join, in accordance with Roofing Manufacturer's recommendations and requirements.
d. Solidly adhere with adhesive approved by the steep slope roofing manufacturer the first two courses of steep slope roofing material, ensuring that fasteners do not penetrate within 18 inches (458mm) of the roof join.
2. Area Dividers:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend application of composite to the top of area divider curbs.
c. Install fabricated metal cover. Fasten sides at 12 inches (609 mm) on center with fasteners and neoprene washers. Furnish all joint cover laps with sealant between metal covers.
3. Expansion Joints:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend application of composite to the top of the support curb.
c. Install pre-manufactured expansion joint cover in accordance with Manufacturer's recommendations.
d. Fasten sides as noted by expansion joint manufacturer with fasteners and neoprene washers. Furnish all joint cover laps with sealant between metal covers.
e. Set equipment on neoprene pads and fasten as required by equipment manufacturer.

3.6 FIELD MEMBRANE INSTALLATION

A. Apply one layer of the composite roofing at the following ratio:
1. Asphalt Emulsion (undiluted): 30 gal. per 100 square feet (12.2 l/m2).
2. Fiberglass Reinforcement: 16 lb. per 100 square feet (0.78 Kg/m2).

B. In accordance with the roofing system manufacturer's flashing details, apply seamless composite to the entire roof surface, terminating at the following locations:
1. Tops of base flashings and curbs
2. Outside edges of perimeter metal flashings.
3. Outside edges of walls.
4. Insides of drain bowls.

C. No water or other material may be added to the emulsion to thin or extend pot life.

D. Fiberglass must be disbursed from the applicator in varying intertwined lengths, up to 24 inches (610mm).

E. Thoroughly mix fiberglass and emulsion prior to application on prepared roof substrates.

F. Any loose strands must be brushed by hand, removed or filled-in with emulsion to create a solid surface.

G. Upon completion, no area may be less than 250 mil dry film thickness (DFT).

H. Areas such as base flashings and penetrations, where application exceeds 500 mils wet, must be brushed by hand to prevent surface crazing.

I. Where required due to project phasing or when ambient temperatures exceed 100 degrees F (37C), apply seamless composite membrane in two passes of half the recommended wet mil thickness.

3.7 REFLECTIVE COATING INSTALLATION

A. Prior to reflective coating application, wash the roof surface with water. Do not commence application until the system has thoroughly dried, as registered by a reading of zero with a calibrated moisture meter.

B. Where Title 24 compliant roof coatings are specified, apply both base coat and top coat to the entire roof surface, each at a minimum of 1 1/2 gal. per 100 square feet (0.6 L/m2) to total 3 gallons per 100 square feet. (1.2 L/m2). Allow the base coat to dry before proceeding, and backroll to ensure even coverage throughout.

3.8 ROOFTOP DUCT ENCAPSULATION

CONTRACTOR – Review requirements for encapsulating ROOF DUCTS.

A. Where specified in the Owner or Architect's RFP, rooftop sheet metal ducts may be encapsulated with the rooftop composite membrane system specified in this section, installed at 250 mil DFT.

B. Install on top and sides of sheet metal ductwork. Do not apply membrane to the underside of ductwork, on or above mechanical units or on flexible bellows.

3.9 WALKWAY APPLICATION

CONTRACTOR – Review requirements for installing WALKPADS & TRAFFIC SURFACES

A. Embedded Granule Traffic Surfacing:
   1. Where specified in the Owner or Architect's RFP, granules may be broadcast into the membrane to provide a slip resistant foot traffic surfacing.
   2. Immediately following the application of the field, mineral granules may be broadcast into the wet acrylic membrane in areas where traffic is likely to occur. Backroll granules with a suitable roller immediately.
   3. Apply granules at a rate of 20 Lbs. (9 kg) per 100 square feet.

3.10 FINAL ROOF INSPECTION

A. At completion of roofing installation and associated Work, schedule a conference to include the Architect, Contractor, roof membrane installer, installers of associated work, roofing system Manufacturers' representative and others directly concerned with performance of roofing system.

B. Perform a site walk of roof surface, inspecting perimeter edges and flashings. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Should roof core testing verify the presence of damp or wet materials, it is the responsibility of the installer to replace the damaged areas at their expense.

D. The repair or replacement of defective work found during inspection is required to produce an installation that is free of damage and deterioration at time of Substantial Completion and is required to execute the Manufacturer's warranty.

E. Notify Architect upon completion of corrections.

F. Upon a successful final inspection and fulfillment of administrative terms, the contractor will provide an executed copy of the Manufacturer's warranty and written acceptance of the installation.

3.11 PROTECTION

A. Prior to allowing any traffic on a newly installed roof membrane, authorization in writing must be obtained from the roof system Manufacturer.

B. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roof for deterioration and damage. Where any defects or damage are identified describe their nature and extent in a written report, with copies to architect and owner.

C. Protect exposed surfaces of finished walls with tarps to prevent damage.

D. Plywood required for material movement and traffic over existing roofs must be a nominal 5/8 inch (16 mm) thick or greater.

3.12 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles, and other debris resulting from these operations.

B. Remove coating markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

WeatherWeld – A Division of Liquiform Technologies
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5/1/2026

Pacific Grove USD
43 Hillcrest Avenue
Pacific Grove CA 93950

Attn: Jon Anderson

Re: Public Distribution of WeatherWeld Documentation

Dear Jon,

It is my understanding that you intend to publish WeatherWeld's standard specifications within the minutes of a community board meeting.

Please allow this letter to confirm that WeatherWeld has no objections to Pacific Grove Unified School District publicly disseminating our product information within a community forum, either digitally or as printed copies.

If you have any questions or concerns, please feel free to contact me directly.

Very Truly Yours,

Robert S. Weygant, CSI, CDT
Chief Technical Officer
WeatherWeld – A Division of Liquiform Technologies
P: (951) 655-0537
E: robert@weatherweld.com

WEATHERWELD
ROOFING MADE SIMPLE

3-PART SPECIFICATION

This specification serves as a comprehensive document outlining the materials, methods, requirements, and quality assurance guidelines for a WeatherWeld roofing system. The document plays a crucial role in ensuring consistency, durability, and compliance with building codes and industry standards.

CONTRACTORS:

Reading and understanding this specification helps to ensure a successful and high-performing roofing installation.

CONTRACTOR – As a courtesy, we have highlighted critical areas of the document

But it is **your responsibility** to ensure that ALL project requirements are fulfilled, so be sure that you...

READ THIS ENTIRE DOCUMENT THROUGHLLY

Clarity and Standardization

The primary purpose of this specification is to provide clear guidelines for all parties involved in this project. Using the standardized CSI 3 Part format reduces miscommunication and errors during construction.

Material and Performance Requirements

This specification establishes detailed material and performance criteria, ensuring that the selected roofing system meets the project's needs. By setting these criteria, the specification helps project teams select high-quality materials that comply with local building codes and industry standards, such as ASTM International (ASTM), Underwriters Laboratories (UL), Factory Mutual Global (FM Global), and the National Roofing Contractors Association (NRCA).

Quality Control and Compliance

A well-defined roofing specification ensures that the installation process follows strict quality control measures to meet safety and performance expectations. It includes:

- *Pre-installation requirements (surface preparation, weather conditions, and material storage guidelines)*
- *Step-by-step installation procedures to ensure proper adhesion, fastening, and sealing.*
- *Testing and inspection protocols, such as fire resistance and wind uplift testing.*
- *Warranty requirements from manufacturers and contractors.*

By establishing these controls, the roofing specification helps prevent costly failures, such as leaks, material degradation, or structural damage.

Project Coordination and Accountability

A roofing specification clarifies roles and responsibilities, ensuring that architects, contractors, and manufacturers are aligned throughout the project. It provides:

- *A clear roadmap for contractors to follow during installation.*
- *Manufacturer-approved guidelines to ensure proper use of products and appropriate installation methods.*
- *A reference point for architects and engineers to verify compliance with design intent.*

The intent of this specification is to provide a clear, standardized, and detailed framework for designing and installing a high-quality roofing system. It ensures appropriate materials, code compliance, quality control, and project coordination.

SECTION 07 51 23

GLASS FIBER REINFORCED ASPHALT EMULSION ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Seamless Fluid Applied Composite Roof Systems.

B. Roof Flashings.

C. Roof Accessories.

1.2 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Cap flashing and expansion joints.

C. Section 07 71 00 - Manufactured Roof Specialties: Counter flashing, gravel stops, fascia, scuppers, gutters, and downspouts.

D. Section 07 72 00 - Roof Accessories.

E. Section 22 30 00 - Plumbing Equipment: Adjacent Piping Vents and Drains.

F. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 REFERENCES

A. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.

B. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM):
1. ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board.
2. ASTM C 1153 - Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging.
3. ASTM D 570 - Standard Test Method for Water Absorption of Plastics.
4. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
5. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
6. ASTM D 1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
7. ASTM D 2523 - Standard Practice for Testing Load-Strain Properties of Roofing Membranes.
8. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, and Fibered.
9. ASTM D 3909 - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules.
10. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

11. ASTM D 4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
12. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
13. ASTM E 548 - Standard Guide for General Criteria Used for Evaluating Laboratory Competence.
14. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. Underwriters Laboratories (UL):
   1. TGFU - Roofing Systems and Materials Guide.
   2. UL 790 - Standard Test Methods of Roof Coverings.
   3. UL 2218 - Impact Resistance of Prepared Roof Covering Materials

E. CRRC - Cool Roof Rating Council.

F. California Building Standards Code - Title 24.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual.

1.4 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to Work in this Section.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide watertight roofing membrane and flashing system that does not permit the passage of water, resists uplift pressures specified in this section, and is capable of withstanding thermally induced movement and exposure to weather without failure.

B. Energy Performance:
   1. Low-Slope Roofs: Provide a roofing system with Solar Reflectance Index not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
   2. Roof membrane finish must comply with current California Title 24 Part 6 requirements:
      a. Minimum three (3) year aged solar reflectance: 0.63.
      b. Minimum Thermal Emittance: 0.75.

C. Wind Resistance: Provide roofing membrane, base flashings and component materials that comply with requirements in FMG 4450, FMG 4470, UL 580 or UL 1897 as part of a membrane roofing system.
   1. Wind Load Resistance: 45 psf (1-90).

D. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings from the applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A in accordance with ASTM E 108 for application and roof slopes indicated.

1.6 SUBMITTALS

A. Submit in accordance with Section 01 30 00 - Administrative Requirements.

B. Product Data: For each product note in this section, submit printed or digital copies of the manufacturer's product information including the following:
   1. Printed affirmation of performance characteristics.
   2. Roofing system design.
   3. Application Instructions.
   4. Technical Data Sheets.
   5. Material Safety Data Sheets.

C. LEED Submittals:
   1. Product Data for Credit SS 7.2: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement.
   2. Product Data for Credit EQ 4.1: For adhesives and sealants, including printed statement of VOC content.

D. Anti-Collusion Affidavit: Submit affidavit that certifies that the bid proposal is genuine, not done in the interest of another person or entity, and that the Bidder has not 1.) conspired to create a falsified bid for comparative purposes, 2.) asked competitors to refrain from bidding, or 3.) conspired with competitive bidder(s) or manufacturer(s) to create an unfair advantage.

E. Installer Authorization: Provide an executed affidavit from the roofing system manufacturer that the Installer is in good standing and authorized to provide the Warranty specified in this section.

F. Project References: Provide verifiable references for no less than five (5) projects of the same size, scope and roofing system as the Work specified in this section.

G. Warranty Documents: Provide sample copies of the Manufacturer's standard form outlining the terms and conditions of the warranty specified for the Work in this section.

H. Shop Drawings: Provide plan, elevation, section, and isometric drawings outlining waterproofing conditions at transitions, terminations, penetrations and attachments to adjacent work.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of the roofing system.

J. Thermographic Roof Evaluation Reports: Where existing roofs are to remain in place and be encapsulated or "re-roofed", submit evaluation reports provided by a Certified Infrared Thermographer.

K. Research & Evaluation Reports: Include certifications from independent, third-party testing agencies such as Intertek, UL, ICC, FM or similar, stating the entire roofing system meets each of the performance characteristics listed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer must have no less than five (5) years' experience installing the type of roofing system specified in this section.
   2. Installer must be authorized by roofing system manufacturer to provide the manufacturer's full system warranty specified in this section.
   3. Installer shall not be the same business entity, a subsidiary of, or coupled with the roofing system manufacturer.

B. Manufacturer Qualifications:
   1. A roofing system manufacturer with no less than twenty (20) years of experience manufacturing roofing systems identical to the Work specified in this section.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Moisture Analysis: Where existing roofs are to remain in place and be encapsulated or "re-roofed", it is the responsibility of the contractor to perform a moisture analysis in accordance with ASTM C 1153 to determine suitability.

1.8 PRE-INSTALLATION CONFERENCE

A. Prior to commencement of Work, conduct a conference at project site. Comply with the requirements of Section 01 31 00 - Project Management and Coordination. Review and affirm methods and procedures related to the work specified in this section, including but not limited to the following:
   1. Meet with owner, 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 the 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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original containers, with seals unbroken, and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage. For bulk-delivered materials, identify manufacturer's name and product designation with delivery receipts and material manifests.

B. Protect roofing materials from physical damage and from deterioration due to sunlight, moisture, soiling and other sources. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

C. Store liquid materials in their original, undamaged containers in a clean, dry, and protected location, between 50 degrees F to 80 degrees F (10 degrees to 26.7 degrees C). Ensure jobsite storage is in a shaded and well-ventilated area, away from open flame or welding sparks. Indoor Storage is recommended.

D. Do not stockpile materials on roof without first obtaining acceptance from the Architect.

E. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

1.10 PROJECT CONDITIONS

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

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside Manufacturer's absolute limits.

C. The minimum temperature for application of WeatherWeld Emulsion and WeatherWeld Acrylic Coating is 50 degrees F (10 degrees C) and rising.

D. When ambient temperatures are above 100 degrees F (37 C), membrane application should be performed in two equal passes to ensure premature skinning does not occur.

E. Product application must not be performed when rain or other ambient moisture conditions such as fog or heavy dew are possible within 72-hours of completion. Roof surface must be a minimum of 6 degrees F (3 C) above the dew point and rising.

F. Safety Data Sheets (SDS) must be on location during transportation, storage, and application of materials.

G. Schedule and phase work such that new roofing materials are not subject to construction traffic. Protect new roof sections and inspect for damage upon completion.

H. When applying materials with spray equipment, take precautions to prevent overspray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles, or other property.

I. The surface on which the roof system is applied must be clean, smooth, dry, and free of projections or contaminants that could prevent proper application of or be incompatible with the new installation. Correct all sharp edges, foreign materials, oil, and grease.

J. Take precautions to ensure that materials do not freeze.

K. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.

1.11 WARRANTY

A. No Dollar Limit (NDL) Warranty: Provide Manufacturer's written and signed No Dollar Limit (NDL) warranty document, affirming coverage in the event of a leak in the roofing membrane or base flashings applied within the scope of work outlined in this section.
   1. Warranty Period: Forty (40) years from date of Substantial Completion.
   2. Coating Warranty: Twelve (12) years from date of Substantial Completion.

B. Project Warranty: Submit roofing installer's signed and executed warranty document affirming coverage of all work of this Section, including but not limited to insulation, cover board, fasteners, base sheet, roofing membrane, base flashings, and walkway products.
   1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Liquiform Technologies Inc – WeatherWeld.
   1. Within 7 days of the initial site visit, "or equal" roofing systems may be considered, provided the systems meet all performance requirements, physical characteristics and warranty duration specified in this document, and do not use solvents or fire during installation.

B. Acceptable Manufacturer(s): _____.

2.2 COMPOSITE MEMBRANE SYSTEM

A. General:
   1. Roofing system must comply with 2022 CBC, Chapter 15.
   2. Subject to compliance with requirements, provide the specified membrane configuration, applied over existing low slope roofs.

B. Basis of Design: R-16-30-A, by WeatherWeld. Composite roof applied over approved existing low slope roofing with CA Title 24 compliant cool roof surface coating.
   1. Physical Properties:
      a. Total Weight: 1.5 pounds per square foot (0.68 kg) dry.
      b. Nominal Thickness: 250 mil Dry Film Thickness (DFT).
      c. Minimum Strength: 600 psi (4136 kN/m2) per ASTM D 2370.
      d. Minimum Elongation: 10% per ASTM D 4830.
      e. Minimum Puncture Resistance: 700 lb. (318 kg) per ASTM D 4830.
      f. Water Absorption: 1% max by weight per ASTM D 570.
      g. Fire Rating: UL Class "A" assembly.
   2. System Configuration:
      a. Fiberglass Roving: 16 lbs. per 100 square feet.
      b. Asphalt Emulsion: 30 gallons per 100 square feet.
      c. Base Coating: 1.5 Gallons per 100 square feet.
      d. Top Coating: 1.5 Gallons per 100 square feet.

2.3 COMPOSITE MEMBRANE MATERIALS

A. Asphalt Emulsion: Asphalt Emulsion meeting or exceeding the requirements of ASTM D 1227; WW471145, by WeatherWeld.
   1. VOC Content (Maximum): 0 g/l.
   2. Wet Weight: 8.7 Lbs./Gal. (1041 g/l).
   3. Dry Weight: 4.35 Lbs./Gal. (521 g/l).
   4. Solids Content by Volume: 49-53%.

B. Fiberglass Reinforcement (Type E): Multi-end continuous fiberglass roving designed for spray operations; WWFG100, by WeatherWeld.
   1. Yield: 207 yd/lb.
   2. Tex: 2400 g/km.
   3. Spool Weight: 41.9 LB (19kg).

C. Reflective Acrylic Coating: CA Title 24 Cool Roof Reflective Coating as supplied by the manufacturer of the membrane system; TRI-BUILT Roof-X-Tender 500, by QXO.
   1. Solids Content by Volume: 50%.
   2. VOC Content (maximum): <50 g/l.
   3. Weight: 10.4 lbs./Gal. (1246 g/l).
   4. Color: White.
   5. Solar Reflectance:
      a. Initial: 0.83.
      b. 3 Year Aging: 0.72.
   6. Thermal Emittance:
      a. Initial: 0.86.
      b. 3 Year Aging: 0.88.
   7. Solar Reflectance Index (SRI):
      a. Initial: 104.
      b. 3 Year Aging: 88.

2.4 SHEET MATERIALS

A. Self-Adhering Base Sheet: Sanded/ granule surfaced, self-adhering base sheet, meeting or exceeding the requirements of ASTM D 1970.

B. Detailing Membrane: with adhesive backing.
   1. Elongation: 85%.
   2. Thickness: 75 mils.
   3. Weight: 3 oz/ sq. yd.
   4. Roll Width: 6 inch and 12 inch.

2.5 ADHESIVES AND SEALANTS

A. Flashing Cement: Trowel grade SBS-modified flashing cement made from heavy-bodied asphalt reinforced with organic fibers.
   1. VOC Content (Maximum): 290 g/l.
   2. Weight per Gallon: 8.25 – 9.25 Lbs (988 – 1107 g/l).

B. Asphalt Primer: Asphalt based surface primer suitable for application on metal, masonry and concrete surfaces. Meets or exceeds the requirements of ASTM D 41.

C. Polyurethane Sealant: Moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant. Meets ASTM C 920, Type S, Grade NS, Class 35; Sikaflex-1A, manufactured by Sika.

2.6 SHEET METAL, FLASHING AND TRIM

A. Metal Flashing Sheet: 24 ga. galvanized sheet metal flashing.

B. Pre-Formed Edge Flashing: 24 ga. galvanized sheet metal flashing with a 1/2 inch (13mm) vertical "gravel stop" lip and. minimum 4 inch (102mm) roof mounting flange.

C. Flashing Collar: Pre-formed 24 Ga. galvanized sheet metal boot and collar for sealing single or multiple pipe penetrations.

D. Plumbing Stacks: 24 Ga. galvanized sheet metal flashing, or 4 lb (1.8kg) sheet lead formed, rolled and soldered.

E. One-Way Breather Vents: Heavy gauge spun aluminum vents which allow moisture and air to escape but not enter the roofing system.

F. Pitch Pans: 24 gauge galvanized sheet or 20oz (567gram) copper.

G. Drain Flashings: 24 gauge galvanized sheet, 20oz (567gram) copper, or 4 lb (1.8kg) sheet lead, formed and rolled,

H. Fabricated Flashings:
   1. Fabricated flashings and trim may be specified in Section 07 62 00.
   2. Fabricated flashings and trim must conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

I. Manufactured Roof Specialties:
   1. Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim may be specified in Section 07 71 00.
   2. Manufactured roof specialties must conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

2.7 WALKWAYS

CONTRACTOR – Confirm Requirements for walkways. Check if listed in Owner's RFP.

A. Foot Traffic Walkway Coating:
   1. Acrylic Coating: Fluid applied, single-component, 100% Acrylic, waterproof walking surface with ceramic granules designed to enhance the traffic resistance of the roof surface.
      a. Coating Properties:
         1) Tensile Strength: 350 psi when tested in accordance with ASTM D 412.
         2) Elongation: 174% when tested in accordance with ASTM D 412.
         3) Solids Content: 95% when tested in accordance with ASTM D 2369.
         4) VOC: <50 g/l.
         5) Flash Point: 141 degrees F min. (60.6 degrees C) when tested in accordance with ASTM D 93.
         6) Color: Safety Yellow.
      b. Granule Properties:
         1) Specific Gravity 2.65 when tested in accordance with ASTM C 128,
         2) Bulk Density: 90-100 lbs./Cu. Ft. when tested in accordance with ASTM C 29.
         3) Color: Yellow.

2.8 ACCESSORIES

A. General: Roofing accessories recommended by manufacturer for intended use and compatible with membrane roofing.

B. Fasteners:
   1. Screws and Plates: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate and acceptable to roofing system manufacturer.

C. Cant Strips: 4" angled wood fiber strips meeting the requirements of ASTM C 728.

D. Tapered Edge Strips: Tapered wood fiber strips meeting the requirements of ASTM C 728.

E. Wood Nailers: Comply with requirements in Division 06 Section "Miscellaneous Carpentry."

F. Anti-Skid Granules: Granules specifically designed for anti-skid purposes and compatible with all coatings specified in this section.
   1. Specific Gravity 2.65 when tested in accordance with ASTM C 128,
   2. Bulk Density: 90-100 lbs./Cu. Ft. when tested in accordance with ASTM C 29.
   3. Color: As selected by Owner.

PART 3 EXECUTION

3.1 EXAMINATION

A. Compatibility, verify all materials including existing roof are compatible.
   1. Verify existing roof systems to be recovered are NOT coated with silicone style coatings.
   2. Verify existing roof systems to be recovered are NOT PVC single ply membrane.
   3. Verify the following for installations over lightweight insulating concrete (LWIC):
      a. Decks must be a minimum of 2 inches (51 mm) thick with a compressive strength of no less than 125 psi (0.86 MPa) and a density of 22 pcf (352 kg/sm).
      b. Slopes must not exceed 1 inch per foot (83 mm/m).
      c. Membrane and insulation may not be applied directly to lightweight concrete. Mechanically attach an approved specified base sheet prior to application of subsequent insulation or membrane.

B. Examine substrates, work areas and field conditions for compliance with the following requirements and other conditions which may affect the performance of the roofing system. Verify the following conditions:
   1. Surfaces are clean, rigid, dry, smooth, and free from cracks, holes, blisters, debris and sharp changes in elevation greater than 1/4 inch (6mm).
   2. The deck is free of depressions, waves or projections and properly sloped to drains, valleys, eaves, scuppers, or gutters.
   3. Roof openings and penetrations are adequately installed, and that roof drains are securely clamped in place.
   4. Cant strips, blocking, curbs and nailers are securely anchored and installed in accordance with manufacturers requirements.
   5. Drains and scuppers are free of ruptures and sealed on all four sides on the exterior face of walls.
   6. Surface plane flatness and fastening of roof deck complies with manufacturers requirements.
   7. Concrete curing compounds and any chemicals that may impair adhesion of roofing components have been removed.
   8. Existing roof assemblies are dry, confirmed by conducting infrared thermal scans.
   9. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method in accordance with ASTM D 4263.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Owner or Architect of unsatisfactory conditions before proceeding.

3.2 PREPARATION

A. Do not begin installation until all substrates have been properly prepared.

B. Prior to application, clean waterproof application surfaces with water. Where wash water must be reclaimed due to contamination concentrations, roof water collection design of the building or local ordinances. Conform to local requirements for disposal of wash water.

C. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation in accordance with the roofing system manufacturer's written instructions.

D. Remove or correct all sharp projections which may interfere with the integrity of the membrane.

E. Provide traffic paths, and erect barriers, fences, guards, rails, enclosures, chutes, and other measures to protect personnel, roofs and structures, vehicles and utilities.

F. Protect roof drains and edges during construction to prevent materials from entering roof drains and conductors or migrating onto surfaces of adjacent construction. Remove roof drain plugs when no work is taking place or when rain is forecast.

G. Protect adjacent materials and lower paving, prior to starting work, in accordance with roofing system Manufacturer's instructions.

3.3 EXISTING ROOF PREPARATION

A. General:
1. Suitable roofs for recover must be free of dust, dirt, debris, and any contaminants which may affect the performance of the new roof. Areas of substantial deck deflection or membrane imperfections must be corrected prior to commencement of Work.
2. Single-ply PVC roofing and silicone coatings are not suitable substrates. Remove the existing roof system in areas where either is present.
3. Core sample test cuts must be performed to verify the construction and condition of the existing roof.
4. Perform an infrared moisture scan in accordance with ASTM C 1153 to determine the suitability of existing roof systems to be encapsulated.
5. Any existing substrates and insulation must be dry. Wet or deteriorated areas of insulation and substrate must be removed and replaced with new materials.
6. Comply with local building codes where requirements exceed those listed.

B. Perimeter Flashings: Remove all existing perimeter edge flashings including coping caps, counterflashings and termination bars.

3.4 ROOF MEMBRANE INSTALLATION - GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA and NRCA.

B. Commence installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services during roofing system installation.

D. Coordinate installation to ensure that materials that will not be permanently exposed are protected from moisture and covered at the end of each workday.
1. Provide tie-offs at the end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Substrate Joint Penetrations: Where exceeding 1/4 inch in width (6mm), tape joints with detailing membrane to inhibit roofing materials from penetrating substrate, entering building, or damaging roofing system components or adjacent building construction.

3.5 FLASHING INSTALLATION

CONTRACTOR – Review requirements for application around FLASHING DETAILS.

A. General:
1. Refer to the manufacturer's application manual for flashing specific details.
2. All flashings must have a minimum of 536 mil of fiberglass composite upon completion of the installation.

3. Fabricated flashings and trim must conform to the requirements found in the current SMACNA "Architectural Sheet Metal Manual".
4. Manufactured Roof Specialties: Manufactured copings, fascia, control joints, and related flashings and trim must conform to the requirements found in the SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractors Association "Roofing and Waterproofing Manual".

B. Surface Preparation:
   1. All wood surfaces must have a base sheet installed prior to flashing application. Fasten base sheet following the same method and pattern as the field application.
   2. All metal, concrete and masonry surfaces must be primed with ASTM D 41 primer prior to flashing application.
   3. Any joint in the structure intended to allow for movement must be divorced from the seamless reinforcement composite.
      a. Install an 18 inch (457mm) wide slip sheet consisting of inverted (mineral-side down) cap sheet, laid dry over the joint and extending 36 inches (914mm) at each end.
      b. Over the slip sheet, solidly adhere a 36 inch (914mm) polyester ply in 4 gallons per 100 square feet (1.63 L/m2) of emulsion and reinforce with 536 mil of seamless composite.
   4. Cant Strips: Minimum 3 inch (76mm) cant strips must be installed at base flashings, walls, and curbs. Miter cants at ends to provide a smooth transition and set in adhesive.

C. Perimeter Conditions
   1. Metal Drip Edges:
      a. Inspect nailers for proper attachment and configuration.
      b. Install the specified base sheet, extending and turning 1 inch (51mm) down the edge.
      c. Install continuous cleat and fasten at 6 inches (152 mm) on center.
      d. In recover applications where base sheet is not specified, adhere a continuous strip of self-adhering membrane to the eaves, 1 inch (25mm) down the vertical face and extending 5 inches (126 mm) onto the roof surface.
      e. Attach new metal edge to cleat, with 3/8" head roofing nails located less than 1 inch (25mm) from the interior edge of the flange, spaced every 3 inches (76 mm) on center.
      f. Apply primer to metal edges at a rate of 100 square feet per gallon and allow to dry.
      g. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the interior edge, extending 4 inches (102mm) onto the roof surface.
      h. Coordinate placement to ensure membrane laps do not coincide with metal laps.
      i. Reinforce with 500 mil of seamless composite. Extend the field application of composite to the outside edge of the metal flashing.
      j. Apply composite flush with the edge to ensure that water does not pond.
   2. Coping Caps:
      a. Attach tapered nailer to top of wall with a minimum slope of 1/4 per foot.
      b. Cover nailer and all exposed wood with detailing membrane, extending 2 inches (50mm) over edges.
      c. Reinforce with 500 mil of seamless composite. Extend field application of composite to the outside edge of wall.
      d. Install continuous cleat and fasten at 6 inches (152 mm) on center to outside wall.
      e. Install new metal coping cap hooked to continuous cleat.
      f. Overlap joints a minimum of 4 inches (101 mm) and install in a 1/4 inch (6 mm) bed of polyurethane sealant.
      g. Install 6 inch (152mm) strips of self-adhering membrane, extending 3 inches (76mm) onto each side of joint. Extend down front and back face of coping.
      h. Fasten interior vertical face of coping cap 24 inches (609 mm) on center with approved fasteners and neoprene washers.
   3. Surface Mounted Counterflashings:
      a. Set counterflashing in adhesive and fasten at 8 inches (203 mm) on center with approved fasteners and neoprene washers.

b. Install sealant at top of counterflashing.

4. Recessed Counterflashings:
   a. Cut a receiver groove into concrete masonry unit wall located at the first horizontal grout joint above base flashing termination.
   b. Secure recessed "Reglet" type counterflashing with expansion fasteners.
   c. Install sealant at top of counterflashing.
5. Skirted Counterflashings:
   a. Skirted counterflashings must be approved by the Manufacturer prior to application.
   b. Where existing counterflashing does not adequately cover finished base flashings, a "skirt flashing" may be installed.
   c. Flashing must extend at least 1 1/2 inches (39mm) behind existing counterflashing and project no greater than 3 inches (76mm) past the bottom edge. Vertical seams must overlap a minimum of 6 inches (152mm).
   d. All metal edges which may come in contact the base flashing must be hemmed to protect the installed membrane.
   e. Mechanically fasten skirt flashing to existing counterflashing using self-tapping screws with neoprene washers.

D. Penetrations
1. Pipe Penetrations:
   a. Embed the prepared and primed galvanized pipe boot in a bed of asphalt roof cement, centering it over the pipe. Fasten at corners where insulation is not present.
   b. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
   c. Reinforce with 500 mil of seamless composite, extending to the top of the pipe boot.
   d. Apply sealant at gap between roof membrane and pipe.
   e. Install storm collar approximately one inch (25mm) above the top of the flashing and secure with a draw band and approved sealant.
   f. Where lead pipe flashings are specified, omit the storm collar and sealant, turning the metal downward and into the top of the pipe by at least 2 inches (51mm). Solder all joints
2. Pitch Pockets:
   a. Place the pitch pocket over the penetration and prime all flanges.
   b. Apply strips of self-adhering membrane around all sides of pitch pocket, extending 6 inches (152 mm) onto the field of the roof.
   c. Fill pitch pocket halfway with non-shrink grout.
   d. Encapsulate entire pitch pocket with 500 mil of seamless composite.
   e. Apply caulk joint between roof system and pitch pocket with roof cement.
   f. Place a water shedding bonnet over the top of the pitch pocket, clamp the top with a drawband, and apply sealant.
3. One-Way Relief Vents:
   a. On recover applications or where lightweight concrete roof decks are present, locate one-way aluminum moisture vents every 1000 sq ft.
   b. Remove existing roof to expose the uppermost substrate and allow a clean work area at least 6 inches from the edge of the flange.
   c. Core a 3 inch (76mm) hole through roof layers and insulation. Do not puncture any vapor barriers which may be present.
   d. Prime the flange and embed the vent in a bed of asphalt roof cement, centering it over the opening.
   e. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
   f. Apply 500 mils of seamless composite to aluminum flange extending to the base of the vent, turning upward by at least 2 inches (51mm).
4. Heat Stacks:
   a. Apply roof system over the entire surface of the roof, sealing the base of the stack with sealant approved for use with high temperatures.

b. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
c. Adhere a continuous strip of self-adhering membrane to the metal flange 2 inches (51mm) from the edge, extending 4 inches (102mm) onto the roof surface.
d. Reinforce with 500 mil of seamless composite.
e. Install new storm collar. Weld or install stainless steel draw brand and caulk.

E. Roof Drainage:
1. Roof Drains:
a. Prior to commencing flashing work, plug drains to prevent debris from entering plumbing.
b. Thoroughly clean all drains to receive roof membrane; prime with ASTM D 41 primer.
c. Taper insulation towards drains to create a sump 24 inches (609 mm) from center of drain.
d. Form 12 inch (305mm) detailing membrane into the drain bowl, extending from 3 inches (76mm) into the bowl, extending outward onto the prepared work surface.
e. Set primed metal flashings (30 inch square minimum) in 1/4 inch bed of roof cement. Extend flashing into drain a minimum of 2 inches (50 mm).
f. Reinforce with 500 mil of seamless composite extending down walls of drain bowl and allow to cure.
g. Install clamping ring, remove drain plug and attach strainer.
2. Scuppers:
a. Inspect nailers for proper attachment and configuration.
b. Apply detailing membrane 1 inch (25mm) over the edge and assure coverage of all wood nailers.
c. Install pre-formed and primed scupper in a 1/4 inch (6mm) bed of roof cement. All seams and corners must be soldered, and scupper must have a minimum 4 inch (101 mm) flange.
d. Fasten scupper flange to nailers every 3 inches (76mm) on center.
e. Adhere a continuous strip of detailing membrane to the metal flange approximately 2 inches (51mm) from the edge and 4 inches (152mm) onto the existing roof surface.
f. Coordinate placement to ensure membrane laps do not coincide with metal laps.
g. Reinforce with 500 mil of seamless composite. Extend the field application of composite to the outside edge of the metal flashing.
h. Apply composite flush with the edge to ensure that water does not pond.
i. scupper edge must be turned downward a minimum of 1 inch (25mm) at outside edge of wall and sealed.

F. Raised Curbs:
1. Mechanical Equipment Curbs:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend field application of composite to the top of the curb.
c. Install rooftop mechanical unit in accordance with its Manufacturers' recommendations.
d. Where equipment is not self-flashing, install pre-manufactured counterflashing with fasteners and neoprene washers 6 inches (152mm) on center, embedded in a bead of sealant.
2. Skylights, Smoke Vents and Roof Hatches:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend field application of composite to the top of the curb.
c. Install pre-manufactured unit in accordance with its Manufacturers' recommendations.
d. Where required by local code, install OSHA compliant, compression mounted skylight protection screens per skylight manufacturers' written instructions.

G. Rooftop Equipment and Accessories:
1. Pipe and Equipment Supports: Install supports in accordance with Manufacturers' guidelines. Traffic pads must be installed under pipe supports and fasteners must not penetrate the roofing membrane.

a. All pipes 2 inches (51mm) in diameter or less may be supported with polymer pipe supports spaced no greater than 8 feet (2438mm) on center.
b. All pipes over 2 inches (51mm) in diameter must be supported with movable pipe hangers or other support system approved by the roofing system Manufacturer.

H. Roof Transitions and Area Dividers
1. Steep-Sloped Roof Transitions: Remove roofing material a minimum of 24 inches (610mm) onto adjacent steep-slope roofs which drain onto the roof in this section.
a. Install self-adhering base sheet, extending 12 inches (304mm) onto low slope roof and 24 inches (609mm) onto steep slope roof.
b. Reinforce with 500 mil of seamless composite.
c. Install steep slope roofing material beginning no less than 12 inches (305mm) from the center of the roof join, in accordance with Roofing Manufacturer's recommendations and requirements.
d. Solidly adhere with adhesive approved by the steep slope roofing manufacturer the first two courses of steep slope roofing material, ensuring that fasteners do not penetrate within 18 inches (458mm) of the roof join.
2. Area Dividers:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend application of composite to the top of area divider curbs.
c. Install fabricated metal cover. Fasten sides at 12 inches (609 mm) on center with fasteners and neoprene washers. Furnish all joint cover laps with sealant between metal covers.
3. Expansion Joints:
a. Install base sheet over all wood surfaces and prime all metal, concrete or masonry surfaces.
b. Reinforce with 500 mil of seamless composite. Extend application of composite to the top of the support curb.
c. Install pre-manufactured expansion joint cover in accordance with Manufacturer's recommendations.
d. Fasten sides as noted by expansion joint manufacturer with fasteners and neoprene washers. Furnish all joint cover laps with sealant between metal covers.
e. Set equipment on neoprene pads and fasten as required by equipment manufacturer.

3.6 FIELD MEMBRANE INSTALLATION

A. Apply one layer of the composite roofing at the following ratio:
1. Asphalt Emulsion (undiluted): 30 gal. per 100 square feet (12.2 l/m2).
2. Fiberglass Reinforcement: 16 lb. per 100 square feet (0.78 Kg/m2).

B. In accordance with the roofing system manufacturer's flashing details, apply seamless composite to the entire roof surface, terminating at the following locations:
1. Tops of base flashings and curbs
2. Outside edges of perimeter metal flashings.
3. Outside edges of walls.
4. Insides of drain bowls.

C. No water or other material may be added to the emulsion to thin or extend pot life.

D. Fiberglass must be disbursed from the applicator in varying intertwined lengths, up to 24 inches (610mm).

E. Thoroughly mix fiberglass and emulsion prior to application on prepared roof substrates.

F. Any loose strands must be brushed by hand, removed or filled-in with emulsion to create a solid surface.

G. Upon completion, no area may be less than 250 mil dry film thickness (DFT).

H. Areas such as base flashings and penetrations, where application exceeds 500 mils wet, must be brushed by hand to prevent surface crazing.

I. Where required due to project phasing or when ambient temperatures exceed 100 degrees F (37C), apply seamless composite membrane in two passes of half the recommended wet mil thickness.

3.7 REFLECTIVE COATING INSTALLATION

A. Prior to reflective coating application, wash the roof surface with water. Do not commence application until the system has thoroughly dried, as registered by a reading of zero with a calibrated moisture meter.

B. Where Title 24 compliant roof coatings are specified, apply both base coat and top coat to the entire roof surface, each at a minimum of 1 1/2 gal. per 100 square feet (0.6 L/m2) to total 3 gallons per 100 square feet. (1.2 L/m2). Allow the base coat to dry before proceeding, and backroll to ensure even coverage throughout.

3.8 ROOFTOP DUCT ENCAPSULATION

CONTRACTOR – Review requirements for encapsulating ROOF DUCTS.

A. Where specified in the Owner or Architect's RFP, rooftop sheet metal ducts may be encapsulated with the rooftop composite membrane system specified in this section, installed at 250 mil DFT.

B. Install on top and sides of sheet metal ductwork. Do not apply membrane to the underside of ductwork, on or above mechanical units or on flexible bellows.

3.9 WALKWAY APPLICATION

CONTRACTOR – Review requirements for installing WALKPADS & TRAFFIC SURFACES

A. Embedded Granule Traffic Surfacing:
   1. Where specified in the Owner or Architect's RFP, granules may be broadcast into the membrane to provide a slip resistant foot traffic surfacing.
   2. Immediately following the application of the field, mineral granules may be broadcast into the wet acrylic membrane in areas where traffic is likely to occur. Backroll granules with a suitable roller immediately.
   3. Apply granules at a rate of 20 Lbs. (9 kg) per 100 square feet.

3.10 FINAL ROOF INSPECTION

A. At completion of roofing installation and associated Work, schedule a conference to include the Architect, Contractor, roof membrane installer, installers of associated work, roofing system Manufacturers' representative and others directly concerned with performance of roofing system.

B. Perform a site walk of roof surface, inspecting perimeter edges and flashings. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Should roof core testing verify the presence of damp or wet materials, it is the responsibility of the installer to replace the damaged areas at their expense.

D. The repair or replacement of defective work found during inspection is required to produce an installation that is free of damage and deterioration at time of Substantial Completion and is required to execute the Manufacturer's warranty.

E. Notify Architect upon completion of corrections.

F. Upon a successful final inspection and fulfillment of administrative terms, the contractor will provide an executed copy of the Manufacturer's warranty and written acceptance of the installation.

3.11 PROTECTION

A. Prior to allowing any traffic on a newly installed roof membrane, authorization in writing must be obtained from the roof system Manufacturer.

B. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roof for deterioration and damage. Where any defects or damage are identified describe their nature and extent in a written report, with copies to architect and owner.

C. Protect exposed surfaces of finished walls with tarps to prevent damage.

D. Plywood required for material movement and traffic over existing roofs must be a nominal 5/8 inch (16 mm) thick or greater.

3.12 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles, and other debris resulting from these operations.

B. Remove coating markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION