SECTION 07563
FLUID APPLIED ROOFING RESTORATION

Copyright 2019 ARCAT, Inc. - All rights reserved

Arvin Union School District
El Camino Real Elementary
2024 Phase II Roofing
Specifications

PART 1 GENERAL

1.1 SCOPE OFWORK

A. Make any necessary repairs, including removal of any wet insulation, blisters, and roofing materials and replace with like materials. Allow repairs to cure completely.

B. Confirm local water run-off ordinances and restrictions prior to cleaning roof. Carefully power wash all roof surfaces with greater than 2,000 psi pressure to remove debris, rust, scale, dirt, dust, chalking, peeling, or flaking coatings, etc. Do not force water into the roof system or damage roof surfaces. Wearing personal protective clothing and equipment, treat areas of algae, mildew, or fungus with a solution of three quarts of warm water and TSP or Simple Green Solution. Rinse at least twice to be sure all cleaning agents or contaminants are completely removed to prevent adhesion issues.

C. If the roof surface becomes contaminated with dirt, dust, or other particles at any time during the application of the LiquiTec system, cleaning measures must be taken to restore the surface to a suitable condition.

D. Open LiquiTec container. Remove Part B jug and its plastic holding compartment out of the pail. Mix Part A liquid for one minute using an electric heavy-duty power drill and Jiffy mixer blade (ES model). Cordless drills are not permitted as they will not properly mix the materials. While mixing, slowly pour contents of Part B jug into the Part A pail. Mix the two components together for two (2) minutes moving the Jiffy blade from top to bottom and along the sides to ensure the product is thoroughly mixed. Always mix entire kit contents together as packaged. Do not break down into smaller quantities.

E. Install Base coating at 4.0 gal/square and roll in reinforcement.

F. Install white top coat at 2.0 gal/square into the base coat and reinforcement.

G. The penetrations and walls are to be competed in their entirety prior to restoring the field of the roof.

H. Re-flash all penetrations and base flashings utilizing SPIV torch system.

I. All side and end laps of the existing roofing system are to have a cove of Tuff Stuff urethane caulking prior to the application of the LiquiTec restoration system.

J. All flashings to be fully reinforced as in the field of the roof.

K. Cut back roof edges and install new SPIV system prior to restoration activities.

L. Contractor to perform adhesion test after cleaning of roof but prior to installation.

M. District purchased materials under CMAS are shown in section 01640.

N. Refer to section 3.3(B) for specific installation procedures.

1.2 REFERENCES

A. ASTM C 92 - Standard Test Methods for Sieve Analysis and Water Content of Refractory Materials.

B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.

C. ASTM C 1250 - Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes.

D. ASTM D 5 - Standard Test Method for Penetration of Bituminous Materials.

E. ASTM D 36 - Standard Test Method for Softening Point of Bitumen.

F. ASTM D 71 - Standard Test Method for Relative Density of Solid Pitch and Asphalt.

G. ASTM D 75 - Standard Practice for Sampling Aggregates.

H. ASTM D 92 - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.

I. ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.

J. ASTM D 113 - Standard Test Method for Ductility of Bituminous Materials.

K. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

L. ASTM D 522 – Standard Test Method for Mandrel Bend Test of Attached Organic Coatings

M. ASTM D 562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.

N. ASTM D 570 – Standard Test Method for Water Absorption of Plastics

O. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

P. ASTM D 816 - Standard Test Methods for Rubber Cements.

Q. ASTM D 1370 - Standard Test Method for Contact Compatibility Between Asphaltic Materials (Oliensis Test).

R. ASTM D 1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Products.

S. ASTM D 1863 - Standard Specification for Mineral Aggregate Used on Built-Up Roofs.

T. ASTM D 1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test).

U. ASTM D 2042 - Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene.

V. ASTM D 2196 - Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer.

W. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness.

X. ASTM D 2369 - Standard Test Method for Volatile Content of Coatings.

Y. ASTM D 3111 - Standard Test Method for Flexibility Determination of Hot-Melt Adhesives by Mandrel Bend Test Method.

Z. ASTM D 3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

AA. ASTM D 4073 – Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes

BB. ASTM D 4209 - Standard Practice for Determining Volatile and Nonvolatile Content of Cellulosics, Emulsions, Resin Solutions, Shellac, and Varnishes.

CC. ASTM D 4212 - Standard Test Method for Viscosity by Dip-Type Viscosity Cups.

DD. ASTM D 4402 - Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer.

EE. ASTM D 4479 - Standard Specification for Asphalt Roof Coatings - Asbestos-Free.

FF. ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

GG. ASTM D 5602 – Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens

HH. ASTM D 5635 – Standard Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens

II. ASTM D 7379 – Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive

JJ. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces

KK. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

LL. SRI - Solar Reflectance Index calculated according to ASTM E 1980.

MM. South Coast AQMD Standards.

NN. SMACNA Architectural Sheet Metal Manual.

OO. ANSI/SPRI ES-1 - Testing and Certification Listing of Shop Fabricated Edge Metal

PP. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

1.3 SYSTEM DESCRIPTION

A. Smooth or Mineral Modified Surface Roof Restoration: Renovation work includes:
   1. Surface preparation: Remove dirt, and debris.
   2. Fascia Edges: Cut back edges. Prime, coat with mastic, cover with fabric.
   3. Parapets and Vertical Surfaces: Cut back and replace flashings with SPIV Min.
   4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.

5. Roof Repairs: Repair blisters, stressed or cracked membrane. Cut back, patch with primer/mastic/membrane.
6. Primer: Prime over new asphaltic materials only.
7. Install Base Coat and fabric reinforcement on flashings and entire roof surface. Let cure, and top coat flashings and entire roof surface.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.

C. Objectives include:
1. Review foreseeable methods and procedures related to roofing work, including set up

and mobilization areas for stored material and work area.

2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
6. Review required inspection, testing, certifying procedures.
7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50-degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50-degree F (10 degree C) and below 80-degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.8 PROJECT CONDITIONS

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

B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when precipitation is expected.

C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

E. When applying materials with spray equipment, take precautions to prevent over spray

and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:

1. Close air intakes into the building.
2. Have a dry chemical fire extinguisher available at the jobsite.
3. Post and enforce "No Smoking" signs.

F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.

G. 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.

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

I. Minimum temperature for application is 50 degrees F (10 degrees C) and rising

1.9 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

1. Warranty Period:
   a. (15 years): 5 years from date of acceptance plus 10 additional years after 5 year inspections by Garland.
      1) Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

A. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.

1. Warranty Period:
   a. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The), which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633; Email:request info (); Web:http://www.garlandco.com, or equal

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ROOF RESTORATION SYSTEM FOR SMOOTH OR MINERAL MODIFIED SURFACE ROOFS

A. LiquiTec System:
   1. Primer: Garla-Block on new asphaltic materials only
   2. Coating: LiquiTec Base & LiquiTec
   3. Flashing: Repair or replace as needed.
   4. Reinforcement: Grip Polyester Soft
   5. Surfacing: None.

2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

B. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

C. Liquid Flashing - Coating: LiquiTec: Multi-purpose, 100% solids, two-part, fast-cure, polyurea

D. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
   1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

E. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 ROOF PREPARATION AND REPAIR

A. General: All necessary field and flashing repairs must be done according to good construction practices, including the removal of all wet insulation and defective materials as identified through a moisture detection survey such as an infrared scan and replacement with like-materials.
   1. Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations.
   2. Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to create a smooth, even surface for application of new roof membranes.
   3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
   4. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
   5. Existing roof surfaces shall be primed as necessary and allowed to dry prior to

installing the fluid-applied roofing system.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that exiting conditions meet the following requirements:
   1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
   2. Application of roofing materials over a brittle roof membrane is not recommended.

D. Remove all loose dirt and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.

E. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope.

F. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.

G. Repair existing roof membrane as necessary to provide a sound substrate for the liquid membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials from Manufacturer providing warranty.

H. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.

3.3 INSTALLATION

A. General Installation Requirements:
   1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
   2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
   3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
   4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
   5. All primers must be top coated within 24 hours of application. Re-prime if more time passes after priming.
   6. Keep roofing materials dry during application.
   7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
   8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.

B. Smooth Surface or Mineral Modified Roof Restoration: Renovation work includes:

1. Surface preparation: Remove dirt, and debris.
2. Fascia Edges: Cut back edges. Prime, coat with mastic, cover with membrane.
3. Parapets and Vertical Surfaces: Cut back and replace fabric base flashings. Prime, coat with mastic, cover with fabric.
4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
5. Roof Repairs: Repair blisters, holes, cuts, cracks, splits or other surface defects. Loose or damaged modified bitumen laps must be resealed/repaired
6. Primer: Prime new asphaltic materials only at a rate of 0.5 gallons per 100 SF.
7. Coating Mixing Procedure:
    a. Mix Part A liquid for one minute using an electric heavy duty power drill and Jiffy mixer blade.
    b. Slowly pour contents of Part B jug, located inside the Part A pail, into the Part A container and mix the two components together for two minutes moving the Jiffy blade from top to bottom and along the sides to ensure the product is thoroughly mixed.
    Always mix entire kit contents together as packaged. Do not break down into smaller quantities.
8. Application of LiquiTec Base and Reinforcement:
    a. Apply a bead of Green Lock XL Sealant or Tuff-Stuff MS into all MB side and end laps to reduce the height of the overlap helping to eliminate voids and tenting under fabric reinforcement
    b. On field surfaces run fabric reinforcement parallel to the low edge using a shingling method up the slope with minimum 3-inch fabric laps.
    c. After positioning reinforcement to roll out, apply coating about 40 inches wide to surface where reinforcement ply is to be applied at a rate of 4.0 gallons per 100 SF.
    d. Use a notched squeegee to spread coating and roller apply with ¾" nap roller to obtain uniform coverage.
    e. Do not apply coating too far ahead of fabric so coating does not dry before fabric can be embedded.
    f. Immediately roll reinforcement into wet coating.
    g. Ensure roller is fully saturated with coating and backroll over the reinforcement surface to fully saturate.
    h. Use care to lay the fabric tight to the roof surface without air pockets, wrinkles, fishmouths, etc.
    i. Lap adjacent rolls of reinforcement 3 inches and end laps 6 inches.
    j. Allow to dry, but no more than 72 hours before applying top coat.
9. Application of Finish Coat
    a. Apply top coat at 2.0 gallon per 100 SF to clean and dry reinforced base coat application.
10. Liquid Flashings:
    a. All flashings are coated in the same manner as the field prior to field application.
    b. Vertical liquid flashings shall run a minimum of 4" onto the horizontal surface
    c. At the drain flashing lift strainer and clamp ring. Remove all asphalt and debris from drain bowl to ensure a clean substrate for coating application.
11. Application of Non-Skid Surface for Walkways
    a. Apply LiquiTec at a minimum of 1.0 gal./100 sq. ft. (0.41 l/m2) to dry top coat within 72 hours of its application.
    b. Broadcast dry roofing granules or 20-40 mesh silica sand into wet coating and immediately back-roll to set.

3.4 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section

07620.

1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.

B. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are provided as specified in Section 07710.

1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractor's Association "Roofing and Waterproofing Manual" as applicable.

C. Metal Edge:

1. Inspect the nailers to assure proper attachment and configuration.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Seal outside edge with rubberized cement.

3.5 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 asphalt markings from finished surfaces.

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

3.6 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

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

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system.

B. Perform field inspection and [and testing] as required under provisions of Section 01410.

C. Correct defects or irregularities discovered during field inspection.

3.8 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Contractor, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.

B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs, and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.

D. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.9 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.10 SCHEDULES

A. Primers:
   1. Garla-Block Primer: copolymer sealant that prevent staining and degradation of surface coatings when installed over smooth or granulated asphalt, coal tar modified bitumen, or smooth asphalt BUR membranes.
      a. Non-Volatile Solids % by Weight, ASTM 3960: 28-32 %
      b. Non-Volatile Solids % by Volume, ASTM 3960: 25-28 %
      c. pH: 8-10
      d. Wet Film Thickness @ 1 gal./100 sq. ft.: 16 mils (microns 406.4)
      e. Flash Point PMCC: None
      f. Drying Time, Touch @ 70 degrees F (21.1 degrees C) /50% R.H.: 1-2 hrs.
      g. Viscosity @ 77 degrees F (25 degrees C) Brookfield RVT, #4 Spindle; 20 rpm, ASTM 2196: 3000-5000 cPs
      h. VOC: 30 g/l max

B. Coatings:
   1. Base Coating: LiquiTec Base: Multi-purpose, 100% solids, two-part, fast-cure, polyurea liquid waterproofing membrane having the following characteristics:
      a. Elongation, ASTM D 412: 433%
      b. Tensile Strength, ASTM D 412: 2300 psi
      c. Tear Resistance, ASTM D 624: 449 lbs./in
      d. Low Temperature Flexibility, ASTM D522: -60°F (-51.1°C)
      e. Hardness, ASTM D2240 (Shore A): 80
      f. Dynamic Impact Resistance (Fully Reinforced System): ASTM D5635, 37 joules
      g. Static Puncture Resistance (Fully Reinforced System): ASTM D5602, 20 kg
      h. Tensile-Tear Resistance (Fully Reinforced System): ASTM D4073,
      i. Tensile Load Strain (Fully Reinforced System): ASTM D4073,

j. Toughness: 140 lb-in.
k. Dry Film Thickness (Fully Reinforced System), 80-88 mils
l. Lap Shear Strength (MB Seam with coating): ASTM D7379, 231 lbf/in.
m. Density @ 77° F (25° C, ASTM D 2939) 9.6 lb./gal (1.2 g/m3)
n. Flash Point: ASTM D 93, 110°F min. (43°C)
o. VOC: 0 g/l
p. Microbial Resistance: ASTM G21, No Microbial Growth

C. Reinforcement/Base Coat
1. Grip Polyester Soft: Strong, elastic polyester reinforcing fabric.

D. Coating: LiquiTec: Multi-purpose, 100% solids, two-part, fast-cure, polyurea liquid waterproofing membrane having the following characteristics:
a. Elongation, ASTM D 412: 433%
b. Tensile Strength, ASTM D 412: 2300 psi
c. Tear Resistance, ASTM D 624: 449 lbs./in
d. Low Temperature Flexibility, ASTM D522: -60°F (-51.1°C)
e. Hardness, ASTM D2240 (Shore A): 80
f. Dynamic Impact Resistance (Fully Reinforced System): ASTM D5635, 37 joules
g. Static Puncture Resistance (Fully Reinforced System): ASTM D5602, 20 kg
h. Tensile-Tear Resistance (Fully Reinforced System): ASTM D4073,
i. Tensile Load Strain (Fully Reinforced System): ASTM D4073,
j. Toughness: 140 lb-in.
k. Dry Film Thickness (Fully Reinforced System), 80-88 mils
l. Lap Shear Strength (MB Seam with coating): ASTM D7379, 231 lbf/in.
m. Density @ 77° F (25° C, ASTM D 2939) 9.6 lb./gal (1.2 g/m3)
n. Flash Point: ASTM D 93, 110°F min. (43°C)
o. VOC: 0 g/l
p. Microbial Resistance: ASTM G21, No Microbial Growth
q. Initial Reflectance: 0.84
r. Initial Emittance: 0.88
s. Initial SRI: 105

E. Flashings
1. Base Coating: LiquiTec Base: Multi-purpose, 100% solids, two-part, fast-cure, polyurea liquid waterproofing membrane having the following characteristics:
a. Elongation, ASTM D 412: 433%
b. Tensile Strength, ASTM D 412: 2300 psi
c. Tear Resistance, ASTM D 624: 449 lbs./in
d. Low Temperature Flexibility, ASTM D522: -60°F (-51.1°C)
e. Hardness, ASTM D2240 (Shore A): 80
f. Dynamic Impact Resistance (Fully Reinforced System): ASTM D5635, 37 joules
g. Static Puncture Resistance (Fully Reinforced System): ASTM D5602, 20 kg
h. Tensile-Tear Resistance (Fully Reinforced System): ASTM D4073,
i. Tensile Load Strain (Fully Reinforced System): ASTM D4073,
j. Toughness: 140 lb-in.
k. Dry Film Thickness (Fully Reinforced System), 80-88 mils
l. Lap Shear Strength (MB Seam with coating): ASTM D7379, 231 lbf/in.
m. Density @ 77° F (25° C, ASTM D 2939) 9.6 lb./gal (1.2 g/m3)
n. Flash Point: ASTM D 93, 110°F min. (43°C)
o. VOC: 0 g/l
p. Microbial Resistance: ASTM G21, No Microbial Growth

2. Coating: LiquiTec: Multi-purpose, 100% solids, two-part, fast-cure, polyurea liquid waterproofing membrane having the following characteristics:
    a. Elongation, ASTM D 412: 433%
    b. Tensile Strength, ASTM D 412: 2300 psi
    c. Tear Resistance, ASTM D 624: 449 lbs./in
    d. Low Temperature Flexibility, ASTM D522: -60°F (-51.1°C)
    e. Hardness, ASTM D2240 (Shore A): 80
    f. Dynamic Impact Resistance (Fully Reinforced System): ASTM D5635, 37 joules
    g. Static Puncture Resistance (Fully Reinforced System): ASTM D5602, 20 kg
    h. Tensile-Tear Resistance (Fully Reinforced System): ASTM D4073,
    i. Tensile Load Strain (Fully Reinforced System): ASTM D4073,
    j. Toughness: 140 lb-in.
    k. Dry Film Thickness (Fully Reinforced System), 80-88 mils
    l. Lap Shear Strength (MB Seam with coating): ASTM D7379, 231 lbf/in.
    m. Density @ 77° F (25° C, ASTM D 2939) 9.6 lb./gal (1.2 g/m3)
    n. Flash Point: ASTM D 93, 110°F min. (43°C)
    o. VOC: 0 g/l
    p. Microbial Resistance: ASTM G21, No Microbial Growth
    q. Initial Reflectance: 0.84 (LiquiTec)
    r. Initial Emittance: 0.88 (LiquiTec)
    s. Initial SRI: 105 (LiquiTec)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. **DESCRIPTION:** The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents.

B. **RELATED WORK SPECIFIED ELSEWHERE:**

1. **General:** Products furnished **and paid for by the Owner are described in the following technical sections and /or in the Drawings.**

2. **DISTRICT SUPPLIED MATERIAL**
Note that this project includes the installation of owner-supplied material; the District has acquired roofing material through the CMAS (California Multiple Award Schedules) program.

1.2 DEFINITIONS

A. **GENERAL:** The following are used to identify products as noted on the Drawings.

B. **OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I.):** Products or equipment furnished by the Owner for installation under this contract.

C. **OWNER FURNISHED OWNER INSTALLED (O.F.O.I.):** Products or equipment to be provided and installed by the Owner, but requiring surfacing, backing, utility connections or other preparation under this contract, for proper installation.

D. **NOT IN CONTRACT (N.I.C.):** Products or equipment to be provided and installed by Owner, not requiring surfacing, backing, utility connections or other preparation under this contract.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. **ROOFING MATERIAL FURNISHED BY OWNER (O.F.C.I.):** District supplied material through the CMAS (California Multiple Award Schedules) program. Related specification sections include;
Section 07563 Modified Bituminous Membrane Roofing

B. MATERIAL LIST

Listed in a Table below is a list of district provided material. Any material or accessories required for the installation of the roof system in excess of the district provided material must be supplied by the Contractor. It is up to the Contractor to determine the precise amount of material required for the completion of this project; and to provide excess material, as required. The cost to handle and break flashing metal from the District provided flat stock is contractor's responsibility.

TABLE OF ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Restoration Material	Liquitec	7844 - Kit	(100) Pails	See Data Sheet
Restoration Base Coat	Liquitec Base	7846-Kit	(300) Pails	See Data Sheet
Shipping and Tax				

PART 3 - EXECUTION

2.2 OWNER'S RESPONSIBILITIES

A. **SUBMITTALS:** Arrange for and deliver necessary shop drawings, product data and samples to Contractor.

B. **DELIVERY:**

1. **General:** Arrange and pay for product delivery to site, in accordance with construction schedule.

2. **Bill of Materials:** Deliver supplier's documentation to Contractor.

3. **Inspection:** Inspect jointly with Contractor.

4. **Claims:** Submit for transportation damage and replacement of otherwise damaged, defective, or missing items.

C. **GUARANTEES:** Arrange for manufacturer's warranties, bonds, service, and inspections, as required.

2.3 CONTRACTOR'S RESPONSIBILITIES

A. **SUBMITTALS:** Review shop drawings, product data and samples and submit to Architect with notification of any discrepancies or problems anticipated in use of product.

B. **DELIVERY:**

1. **General:** Designate delivery date for each product in Progress Schedule.

2. **Receiving:** Receive and unload products at site. Handle products at site, including uncrating and storage.

3. **Inspection:** Promptly inspect products jointly with Owner; record shortages, damaged or defective items.

4. **Storage:** Protect products from damage or exposure to elements.

C. **INSTALLATION:**

1. **General:** Assemble, install, connect, adjust and finish products, as stipulated in the respective section of Specifications.

2. **Repair and Replacement:** Items damaged during handling and installation.

* End Section 01640 *