VENTURA UNIFIED SCHOOL DISTRICT
ATLAS SCHOOL

SECTION 016400 - OWNER FURNISHED PRODUCTS

1 GENERAL

1.1 SUMMARY

A. DESCRIPTION: The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents for projects listed below:
   1. ATLAS SCHOOL 2026 ROOFING PROJECT

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.

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;
   1. Section 075500
   2. Section 073100
   3. Section 07563

B. MATERIAL LIST

Listed in the Tables 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 1. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
ATLAS SCHOOL

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Cap Sheet	KEE-STONE	9600	44	800 sqft roll
Flashing Cap	KEE-STONE	9600NF	10	100 sqft roll
Base Sheet	STRESSBASE 80	4411-80-PRM	240	100 sqft roll
Underlayment	R-MER SEAL	4133	7	200 sqft roll
Metal Roof Coating	COOL-SIL	21050-G	80	5gal pail

3 EXECUTION

3.1 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, inspections, as required.

3.2 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 OF SECTION

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SECTION 07 31 00
ASPHALT SHINGLES

VENTURA UNIFIED SCHOOL DISTRICT

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Completely remove the existing roofing system down to the wood deck

B. Repair any damage noted to the wood deck upon removal of the existing roofing

C. Install two plies of R-Mer Seal Underlayment

D. Install GAF Reflector Series lifetime dimensional shingles in color selected by the Owner or approved equal

E. Provide unit cost pricing for deck replacement per square foot

F. Replace all non-mechanical vents, breathers, heat stacks, and penetration flashings with new and paint to match shingles

G. Install new gutters where existing using 22GA R-Mer flat sheet in color approved by the district from Garland's standard and designer list of colors

H. Install new downspouts at a maximum of 50' spacing fabricated from schedule 30 steel pipe, primed and coated to match gutters

1.2 REFERENCES

A. AC438-1011-R1 - New Acceptance Criteria for Alternative Asphalt Roofing Shingles

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

C. Asphalt Roofing Manufacturers Association (ARMA).

D. ASTM International (ASTM):
1. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
2. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
3. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
4. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
5. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
6. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
7. ASTM C 1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.

8. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
9. ASTM E 903 - Standard Test Method for Solar Absorption, Reflectance and Transmission of Materials Using Integrating Spheres.

E. California Title 24 Energy Efficient Standards.

F. Cool Roof Rating Council (CRRC).

G. National Roofing Contractors Association (NRCA).

H. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.

I. Underwriters Laboratory (UL)
1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.
2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, showing compliance with requirements.

B. Installation Instructions: Manufacturer's installation instructions, showing required preparation and installation procedures.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.

B. Installer Qualifications: Installer must be approved by manufacturer for installation of all roofing products to be installed under this section.

1.6 REGULATORY REQUIREMENTS

A. Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.

B. Install all roofing products in accordance with all federal, state and local building codes.

C. All work shall be performed in a manner consistent with current OSHA guidelines.

1.7 PRE-INSTALLATION MEETINGS

A. Convene a pre-installation meeting a minimum two weeks prior to starting work of this section.
1. Contractor shall schedule and arrange meeting and meeting place and notify attendees.
2. Mandatory Attendees: Roofing installer and manufacturer's representative
3. Review all pertinent requirements for achieving the warranty specified below and set schedule for final warranty inspection.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened labeled packaging until ready for installation.

B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in sunlight.

C. Store bundles on flat surface to maximum height recommended by manufacturer; store rolls on end.

D. Store and dispose of solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 WEATHER CONDITIONS

A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with roofing shingle manufacturer's recommendations.

1.10 WARRANTY

A. Provide shingle manufacturer's standard limited warranty:

B. Provide underlayment Manufacturer’s 5-year warranty
1. Warranty Duration: 10 years

C. Contractor warranty
1. Provide contractor labor and material 5-year warranty

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design (Shingles): GAF, Residential Roofing Products

Toll Free Tel: 800 ROOF-411; Tel: 800-766-3411; Fax: 973-628-3451; Email: TechnicalQuestionsGAF@gaf.com; Web: www.gaf.com.

B. Basis of Design (Underlayment): The design is based upon roofing systems engineered and manufactured by The Garland Company, Inc

Local Representative:
Jason Moronnolte
(661) 889-0449
jmoronnolte@garlandind.com

C. Or Equal.

2.2 SHINGLES

A. Timberline Reflector Series Lifetime Shingles, by GAF or CertainTeed Equivalent:
1. Granule surfaced, high reflectance, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and a mineral granule surfacing.
2. Architectural laminate styling provides a wood shake appearance with a 5 5/8in. exposure. Features highly reflective roofing granules that bounce back the sun's rays and more effectively release absorbed heat.
3. Rated by the Cool Roof Rating Council (CRRC), Title 24 compliant and meets initial Energy Star performance levels.
4. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H;

ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.

2.3 HIP AND RIDGE SHINGLES

A. Distinctive impact resistant self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 25 lineal feet (7.62m) with a 6 2/3 inch (169mm) exposure. Seal-A-Ridge ArmorShield Ridge Cap Shingles by GAF.

2.4 STARTER STRIPS

A. Self-sealing starter shingle designed for all roof shingles. Each bundle covers approx. 120 lineal feet (36.58m). ProStart Starter Strip by GAF.

2.5 LEAK BARRIER

A. Garland R-MER SEAL Self-adhering, self-sealing, bituminous leak barrier to be installed in two layers

2.6 UNDERLAYMENT

A. Garland R-MER SEAL SBS-Modified Self-adhering, self-sealing, bituminous leak barrier
   1. Installed in two layers

2.7 ROOFING CEMENT

A. KEE-Loc zero VOC polyether Mastic

2.8 ROOF ACCESSORIES

A. Urethane Sealant: Tuff-Stuff Sealant

B. Roofing mastic: KEE-Loc polyether trowel-grade mastic

2.9 NAILS

A. Nails: Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

2.10 METAL FLASHING

A. R-Mer SS Flat Stock Pre-Finished Kynar Coated Galvanized Steel: 22 gauge hot-dip galvanized steel sheet, installed in compliance with ANSI/SPRI ES-1
   1. Drip edge to cover 4” on fascia

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until roof deck has been properly prepared.

B. If roof deck preparation is the responsibility of another installer, notify Architect or building owner of unsatisfactory preparation before proceeding.

3.2 REMOVAL OF EXISTING ROOFING

A. Remove all existing roofing down to the roof deck.

B. Verify that deck is dry, sound, clean and smooth, free of depressions, waves and projections.

C. Cover with sheet metal all holes over 1 inch (25 mm) diameter, cracks over 1/2 inch (12 mm) in width, loose knots and excessively resinous areas.

D. Replace damaged deck with new materials.

E. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.3 PREPARATION OF SUBSTRATE

A. Clean deck surfaces thoroughly prior to installation of leak barrier and roof deck protection.

B. At areas to receive leak barrier, fill knot holes and cracks with latex filler.

C. Chimneys: Install crickets on the upslope side of any chimney located in the north, on a roof steeper than 6:12, or wider than 24 inches (610 mm).

3.4 INSTALLATION OF UNDERLAYMENT

A. Install using methods recommended by manufacturer in accordance with local building code. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

B. Eaves:
   1. Place eave edge metal flashing tight with fascia boards; lap joints 2 inches (50 mm) and seal with KEE-Loc Mastic; nail at top of flange.
   2. On roofs with slope between 2:12 and 4:12, and on all roofs in the north, install leak barrier up the slope from eave edge to 36 inches from the edge or at least 24 inches (610 mm) beyond the interior face of the warm exterior wall, whichever is greater; lap ends 6 inches (150 mm) and bond.

C. Valleys:
   1. Install R-MER SEAL leak barrier at least 36 inches wide centered on valley; lap ends 6 inches (150 mm) and seal.
   2. Where valleys are indicated to be "open valleys", install metal flashing over leak barrier before roof deck protection is installed; DO NOT NAIL THROUGH metal flashing; secure by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down edge.

D. Hips and Ridges:
   1. Install R-MER SEAL leak barrier along entire lengths.

E. Roof Deck:
   1. Install one layer of roof deck protection over entire area not protected by eave or valley membrane; run sheets horizontally lapped so water sheds; nail in place.
   2. On roofs sloped at more than 4 in 12, lap horizontal edges at least 2 inches (50 mm) and at least 2 inches (50 mm) over eave protection membrane.
   3. On roofs sloped between 2 in 12 and 4 in 12, lap horizontal edges at least 19 inches (480 mm) and at least 19 inches (485 mm) over eave protection membrane.
   4. Lap ends at least 4 inches (100 mm); stagger end laps of each layer at least 36 inches (915 mm).
   5. Lap roof deck protection over valley protection at least 6 inches (152 mm).

F. Penetrations:
   1. At vent pipes, install a 24 inch (610 mm) square piece of R-MER SEAL leak barrier lapping over roof deck protection; seal tightly to pipe.
   2. At vertical walls, install leak barrier extending at least 6 inches (150 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.
   3. At skylights and roof hatches, install leak barrier up the sides of the frame and 12 inches (305 mm) on to the roof surface on all sides, lapping over roof deck protection.
   4. At chimneys, install leak barrier around entire chimney extending at least 6 inches (152 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.
   5. At rake edges, install metal edge flashing over leak barrier and roof deck protection; set tight to rake boards; lap joints at least 2 inches (50 mm) and seal with KEE-Loc Mastic; secure with nails.
   6. At hips and ridges, install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots are not covered.

3.5 INSTALLATION OF SHINGLES

A. Install in accordance with manufacturer's instructions and requirements of local building code.
   1. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
   2. Handle carefully in hot weather to avoid damaging shingle edges.
   3. Secure with 4 to 6 nails per shingle; use number of nails required by manufacturer or by code, whichever is greater. Nails must be long enough to penetrate through plywood or OSB, or 3/4 inch (19 mm) into dimensional lumber.

B. Install hip and ridge shingles as required by the manufacturer. At ridges, install hip and ridge shingles over ridge or ridge vent material.

C. Make valleys using "closed cut valley" technique:
   1. Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches (305 mm).
   2. Run all courses of shingles from the lower roof slope across the valley at least 12 inches (305 mm) and nail not closer than 6 inches (150 mm) to center of valley.
   3. Run shingles from the upper roof slope into valley and trim 2 inches (50 mm) from center of valley.

D. All penetrations are to be flashed according to NRCA application instructions and construction details.

E. For skylights, consult the manufacturer of the skylight or roof hatch for specific installation recommendations. Skylights and roof hatches shall be installed with prefabricated metal flashings specifically designed for the application of the unit.

3.6 PROTECTION

A. Stage work progress so that traffic is minimized over completed roofing.

B. Protect installed products until completion of project

END OF SECTION

SECTION 07550
MODIFIED BITUMINOUS MEMBRANE ROOFING

VENTURA UNIFIED SCHOOL DISTRICT
2026 LOW SLOPE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cold Applied 2-Ply Thermoplastic Hybrid Roof System (KEE-Stone FB 60). (2.17)(3.4)

B. Accessories. (2.19)

C. Edge Treatment and Roof Penetration Flashings. (2.20)(3.9)

1.2 SCOPE OF WORK

1. Remove the existing roofing system to the wood deck and properly dispose of all debris
2. Repair all deficiencies in wood deck and fascia to match existing
3. Mechanically fasten ½" Densdeck prime coverboard attached per approved wind uplift criteria
4. Install one ply Stressbase 80 set in GreenLock adhesive applied at a minimum 2.5 gal/100sf
5. Install one ply KEE-Stone HP set in KEE-Lock spatter spray foam adhesive applied per product wind uplift criteria and datasheets
6. All vertical flashings to receive KEE-Stone HP Non-fleeceback membrane in a two-ply application
7. All drip edge conditions to be replaced with new Solarbrite KEE clad metal
8. Termination bar to be applied on all flashings set in butyl tape and sealed with Tuff Stuff sealant
9. All curbs to meet a minimum of 6-8" height
10. All expansion joints to be replaced with KEE-Stone roofing membrane
11. The contractor is responsible for ensuring positive drainage and no ponding conditions
12. All gutters to be replaced with new 22GA Garland flat sheet in style selected by the owner from the manufacturer's standard and designer list of colors
13. All downspouts to be replaced with new 3" min schedule 30 steel pipe primed and coated to match the gutter
14. All conduit to be properly supported on Viking C-Port supports
15. All positive attachments including all U-Anchor attachments to conduit are to be supported by sleepers per Garland sleeper detail.
16. 3' wide path of travel to be approved by the owner with Viking KEE walkway pads leading to and around all rooftop mechanical equipment
17. Replace all non-mechanical rooftop air vents, heat stacks, breathers, and penetration flashings with new to match existing. All penetrations are to be appropriately sealed and booted per Garland-approved details. All Exposed ducts to be sealed with Cool-Sil metal coating and Unibond tape

1.3 REFERENCES

A. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

B. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

C. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

D. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

E. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

F. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

G. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

H. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

I. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

J. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

K. ASTM D 6754 - Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

L. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.

M. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

N. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

O. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

P. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

Q. Warnock Hersey (WH): Fire Hazard Classifications.

R. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

S. ASCE 7, Minimum Design Loads for Buildings and Other Structures

T. UL - Fire Resistance Directory.

U. FM Approvals - Roof Coverings and/or RoofNav assembly database.

V. California Title 24 Energy Efficient Standards.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Design Requirements:
   1. Uniform Wind Uplift Load Capacity
      a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.

1) Design Code: ASCE 7, Method 2 for Components and Cladding.
2) Importance Category:
    a) IV
3) Wind Speed: 110 mph
4) Exposure Category:
    a) B
5) Design Roof Height: 20 feet.
6) Minimum Building Width: 110 feet.
7) Roof Pitch: .25 :12.
8) Roof Area Design Uplift Pressure:
    a) Zone 1 - Field of roof 24.8 psf
    b) Zone 2 - Eaves, ridges, hips and rakes 32.7 psf
    c) Zone 3 - Corners 32.7 psf

2. Live Load: 20 psf, or not to exceed original building design.
3. Dead Load:
    a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

C. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

D. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

E. Roof system shall have been tested in compliance with the following codes and test requirements:
1. Cool Roof Rating Council (CRRC)

1.5 SUBMITTALS

A. 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 instructions.

B. Shop Drawings: Submit shop drawings if submitting an alternate roof system other than the basis of design 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, a minimum of 7 days prior to bid opening. Shop drawings must be signed and sealed by a professional engineer licensed in the state of CA.

C. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins. If submitting an alternate to the basis of design, contractor is to submit design pressure calculations a minimum of 7 days prior to bid opening that are signed and sealed by a professional engineer licensed to practice in the state of CA

D. Provide a notarized letter stating that a full-time representative of the roofing manufacturer will perform the site inspections listed in section 3.8

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and

patterns.

G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

I. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

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

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

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.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
   1. Record minutes of the conference and provide copies to all parties present.
   2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
   3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 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 except store KEE-Stone FB 60 rolls flat 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 Garland

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.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 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.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System 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 installer, 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 including Garland Metal Components.
   1. Warranty Period:
      a. 30 years from date of acceptance.

B. 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. Basis of Design: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.
   a. Local Representative:
      1) Jason Moronnolte
         (661) 889-0449
         jmoronnolte@garlandind.com

B. Or Equal

C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
      d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
      e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
      f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
   4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
   5. Failure to submit substitution package, or any portion thereof requested a minimum of 7 days prior to bid opening will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.2 COLD APPLIED 2-PLY THERMOPLASTIC HYBRID ROOF SYSTEM - KEE-Stone FB 60

A. Coverboard: ½" DensDeck Prime attached per engineered wind uplift calculations.
   1. ½" GP DensDeck Prime:

B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. Stressbase 80:

C. Thermoplastic Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive (2):
   1. KEE-Stone HP:

D. Interply Adhesive: (1)
   1. Green-Lock Plus Membrane Adhesive Applied at 2.5 gal/100sqft

E. Interply Adhesive: (2)
   1. KEE-Lock Foam Spatter Spray Applied at 1,500sqft per kit

F. Flashing Base Ply: One ply bonded to the prepared substrate with Flashing Ply Adhesive:
   1. Stressbase 80:

G. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with KEE-Lock Flashing Ply Adhesive:
   1. KEE-Stone HP NF Flashing.

H. Flashing Ply Adhesive (1):
   1. Green-Lock Plus Flashing Adhesive applied at 4 gal/100sqft

I. Flashing Ply Adhesive (2):
   1. KEE-Lock Foam Spatter Spray Applied at 1,500sqft per kit

2.3 ACCESSORIES:

A. Roof Insulation: Provide G-P Gypsum DenDeck Prime or USG Securrock for proper adhesion of the new roofing system

B. Treated wood nailer. Unit cost to be submitted with proposal for replacement of dry rotted or damaged wood nailers

C. KEE Walkway rolls around all equipment and in path leading to the equipment

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Coping Cap: R-Mer 22GA flat sheet fabricated and installed per ANSI/SPRI ES-1. Requires wood nailer and continuous cleat

B. Flashing Boot - KEE Flashing Boot: Solarbrite KEE pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

C. Conduit Supports – Viking C-port foam block supports to be installed to replaced all wood blocks to support all conduit throughout the roof

D. 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.

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

F. Drain Flashings should be 16oz copper formed and rolled.

G. Plumbing stacks should be 16oz copper formed and rolled.

H. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
   1. Tensile Strength, ASTM D 412: 400 psi
   2. Elongation, ASTM D 412: 300%
   3. Density @77 deg. F 8.5 lb/gal typical

I. 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.

J. Manufactured Roof Specialties: Shop fabricated 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.

K. Walk pads: Viking KEE Walkway Roll heat welded directly to the KEE roof membrane installed in all high foot traffic areas
   1. Thickness 5/32 in
   2. Roll Size 30 in x 50 ft

3. Breaking Stength 56 lbs
4. Elongation 205

L. Manufactured Roof Specialties: Shop fabricated 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. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

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

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 400 lbs. (136 k) per fastener.

B. Re-Roofing Applications:
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.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors

Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
   1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
   2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
   1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
   2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
   3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
   4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
   5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
   6. Install base flashing ply to all perimeter and projection details.
   7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Thermoplastic Cap Ply: Allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
   1. All field seams exceeding 10 feet in length shall be welded with an approved automatic welder.
   2. All field seams must be clean and dry prior to initiating any field welding. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes

for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.

3. Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch or strip.
4. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld. The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.
5. The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
6. Follow local code requirements for electric supply, grounding and surge protection. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
7. Properly welded seams shall utilize a 1.5 inch wide nozzle, to create a homogeneous weld, a minimum of 1.5 inches in width.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified

1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified . Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.

5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Coping Cap: Designed per approved architectural details
1. Install continuous cleat first nailed 3” O.C. staggered
2. Position base flashing ply over the wall edge covering nailers completely, fastening 8 inches on center. Install base ply and thermoplastic cap ply with proper material and procedure according to manufacturer's recommendations.

3.6 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.

3.7 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.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of 4 days per working week. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. Stressbase Plus 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf/in XD 550 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 96.2 kN/m XD96.2 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 1,000 lbf XD 1,000 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 4,448 N XD 4,448 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 9% XD 9%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 9% XD 9%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic Cap (Ply) Sheet:
   1. KEE-Stone HP: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D6754
      a. Breaking Strength, ASTM D 751, Proc. B, strip
         1) 375 lbf. (1,668 N)
      b. Tear Strength ASTM D 751
         1) 120 lbf. min. (534 N)
      c. Elongation at Break (%), ASTM D 751, Proc. B, Strip
         1) 40.0%

C. Interply Adhesive:
   1. Green-Lock Plus Membrane Adhesive: Cold applied solvent free membrane adhesive: zero V.O.C. compliant performance requirements:
      a. Non-Volatile Content ASTM D 4586 100%
      b. Density ASTM D 1475 11.4 lbs./gal. (1.36 g/m3)
      c. Viscosity Brookfield 20,000-50,000 cPs.
      d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

e. Slope: up to 3:12

2. KEE-Lock Foam: Dual component, single bead (Spatter Spray) urethane insulation/membrane adhesive.
   a. Tensile Strength (ASTM D 412) 250 psi
   b. Density (ASTM D 1875) 8.5 lbs./gal.
   c. Viscosity (ASTM D 2556) 22,000 - 60,000 cP
   d. Peel Strength (ASTM D 903) 17 lb./in.
   e. Flexibility (ASTM D 816) Pass @ -70 deg. F (-56.7 deg. C)

D. Flashing Base Ply:
1. Stressbase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf/in XD 550 lbf/in
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 96.2 kN/m XD96.2 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 1,000 lbf XD 1,000 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 4,448 N XD 4,448 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 9% XD 9%
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 9% XD 9%
   d. Low Temperature Flexibility, ASTM D 5147
      1) Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:
1. KEE-Lock Foam: Dual component, single bead (Spatter Spray) urethane insulation/membrane adhesive.
   a. Tensile Strength (ASTM D 412) 250 psi
   b. Density (ASTM D 1875) 8.5 lbs./gal.
   c. Viscosity (ASTM D 2556) 22,000 - 60,000 cP
   d. Peel Strength (ASTM D 903) 17 lb./in.
   e. Flexibility (ASTM D 816) Pass @ -70 deg. F (-56.7 deg. C)
2. Green-Lock Plus Flashing Adhesive: Cold applied solvent free flashing adhesive: zero V.O.C.
   a. Non-Volatile Content ASTM D 4586 100%
   b. Density ASTM D 1475 11.8 lbs./gal. (1.17 g/m3)
   c. Viscosity Brookfield 400,000 cPs.
   d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

F. Surfacing:
1. Flashing Cap (Ply) Sheet:
   a. KEE-Stone HP NF Flashing: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D 6754.
      1) Breaking Strength, ASTM D 751, Proc. B, strip
         a) 378 lbf
      2) Tear Strength ASTM D 751
         a) 120 lbf. minumum.
      3) Elongation at Break (%), ASTM D 751, Proc. B, Strip
         a) 40.0%

END OF SECTION

SECTION 07563
FLUID APPLIED ROOFING RESTORATION

VENTURA UNIFIED SCHOOL DISTRICT
METAL PORTABLE ROOF RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal Surface Roof Restoration

B. Accessories

C. Edge Treatment and Roof Penetration Flashings

1.2 SCOPE OF WORK

1. Pressure wash the entire roof surface
2. Repair all corroded areas of metal using 22GA flat sheet attached to the existing panels with rivets and set in non-curing butyl
3. Prime the entire roof surface with Rust-Go primer applied at 0.5 gallons per 100 sqft
4. Reinforce all flat seams, penetrations, and expansion joints with Unibond reinforcement
5. Apply a base coat of Cool-Sil liquid-applied restoration membrane at 2 gallons per 100sqft
6. Apply a topcoat of Cool-Sil liquid-applied restoration membrane at 2 gallons per 100 sqft with #30 white roofing mineral broadcasted in the wet coating for traction
7. All metal surfaced and components are to be completely coated from exposure to weathering
8. Replace all external gutter with new 22GA flat sheet from Garland's standard and designer list of colors
9. Install new schedule 30 steel downspouts primed and coated to match the gutter

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

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

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

F. ASTM D 1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).

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

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

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

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

K. SMACNA Architectural Sheet Metal Manual.

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

1.4 SYSTEM DESCRIPTION

A. Metal Surface Roof Restoration: Renovation work includes:
   1. Surface preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger.
   2. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
   3. Primer: Prime entire roof surface.
   4. Base coat: Apply base coat and fabric on seams and around penetrations/let cure/Apply base coat over the entire roof surface/let cure.
   5. Topcoat: Apply coating over entire roof surface.

1.5 SUBMITTALS

A. 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.

B. Shop Drawings: Submit shop drawings including installation details of fluid applied roofing and flashing prior to job start.

C. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, and color.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with manufacturer's current Application and Installation Guidelines and the 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.

1.7 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.

1.8 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. Storage temperatures should be between 60 degrees F to 80 degrees F (15.6 degrees to 26.7 degrees C). Indoor ventilated storage is recommended. Ensure jobsite storage is in a shaded and ventilated area. Do not store in direct sunlight. Keep materials away from open flame or welding sparks.

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

Architect/Engineer.

1.9 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: Product application must not be done when rain or other conditions such as fog or heavy dew are possible within a 24 hour period. Roof surface must be at least 6 Fahrenheit degrees or 3 Celsius degrees above the dew point and rising.

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 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 of White-Knight Plus/ White-Stallion Plus, White-Knight Plus WC, LiquiTec and Cool-Sil coatings is 50 degrees F (10 degrees C) and rising.

1.10 WARRANTY

A. Warranty Period: 10 years.
   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. Metal Surface Roof Restoration:

B. Warranty Period: 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. Basis of Design: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site:

http://www.garlandco.com.

1) Local Rep:
Jason Moronnolte
(661) 889-0449
jmoronnolte@garlandind.com

B. Or Equal

2.2 METAL SURFACE ROOF RESTORATION

A. Cool Sil HB:
1. Primer: Rust-Go Primer (for priming metal components only)
2. Coating: Cool Sil HB:
3. Flashing: Cool Sil HB
4. Reinforcement: Partial reinforcement on metal panel seams only.
a. UniBond ST

2.3 ACCESSORIES:

A. Silicone Sealant - All-Sil: One part, medium modulus, high-performance sealant intended for use in expansion and control joints, reglets,panels, tilt-up walls, metal curtain walls, copings, window and door perimeters, panel bedding, and glazing details.
1. Tensile Strength, ASTM D 412: 230 psi
2. V Elongation, ASTM D 412: 360%
3. Hardness, Shore A ASTM C 920: 24

B. Silicone Sealer - Cool-Sil FG: One part, 100% silicone, moisture-cure sealer for sealing roof penetrations, drains, existing membrane seams and other flashing details.
1. Tensile Strength, ASTM D 412: 130 psi
2. Elongation, ASTM D 412: 275%
3. Hardness, Shore A, ASTM C 920: 35
4. Adhesion-in-Peel, ASTM C 92: 30 pli

C. Rust-Go Primer

D. R-Mer Coat metal coating

E. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

F. Pitch Pocket Sealer - Universal Pitch-Pocket Sealer: Two-part, 100% solids, self-leveling, polyurethane sealant.

G. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

B. 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.

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

D. Fabricated Flashing: Fabricated flashings and trim are specified
   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
   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 Owner 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 damaged roof flashings from curbs and parapet walls down to the surface of the roof. Remove damaged existing flashings at roof drains and roof penetrations.
   2. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the 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, saturated materials, loose or brittle membrane or membrane flashings, etc. Verify that existing 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, damaged or poor condition roof membrane is not permitted.

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. Confirm local water run-off ordinances and restrictions prior to cleaning roof. Clean the entire roof surface by removing all dirt, algae, mold, moss, paint, oil, talc, rust or other foreign substance. Use a bio-degradable cleaner like Simple Green Oxy Solve when necessary and

warm water. Scrub heavily soiled areas with a brush. Power wash roof thoroughly with an industrial surface cleaner equipped with one piece balanced spray rotating jets for streak free close contact cleaning. Rinse with fresh water to completely remove all residuals. 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 must be repaired/renovated and be made watertight. Any repairs must be with be only with materials compatible with the fluid-applied roofing restoration system.

H. Power washing of metal roof surfaces to remove all loose rust or scale is mandatory before application. Use a high volume air broom or compressed air to remove residual dust rust perforations, etc. Deteriorated metal roof decks must be repaired or replaced prior to the application of the coating system.

3.3 INSTALLATION

A. General Installation Requirements:
   1. Install in accordance with manufacturer's current Application and Installation Guidelines and the NRCA Roofing and Waterproofing Manual.
   2. Adequate coating thickness is essential to performance. If the applicator is unfamiliar in gauging application rates, we suggest that a controllable area be measured and the specified material be applied. In all cases, all minimum specified material must be applied and proper minimum dry film thicknesses must be achieved. Care must be taken to ensure that all areas completed including all flashings, roof penetrations, etc. are coated sufficiently to ensure a watertight seal.
   3. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
   4. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
   5. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore adjacent work damaged by installation of the roofing system.
   6. All primers must be top coated within 24 hours after application, preferably immediately after drying. Clean and re-prime if more time passes after priming.
   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. Metal Surface Roof Restoration: Renovation work includes:
   1. Surface Preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger.
      a. Remove rust by the most rigorous method suitable for the particular project and as approved by Garland.
      b. Tighten all fasteners and verify that neoprene washers are in place.
      c. Replace missing fasteners using oversize fasteners as necessary.
      d. Seal all fastener heads by applying a heavy dab of compatible sealant to the tops and around of all fastener heads.
      e. Repair gaps, holes and joints in the metal roof with appropriate patching materials.
      f. Completely remove existing seam coatings, mastics and sealants.
      g. Ensure skylights, scuppers, gutters, penetrations and structures are firmly secured, watertight and in good working condition.
      h. Where necessary, install water deflecting crickets behind rooftop mechanical units.

i. All roof areas must promote positive drainage.
j. Previously coated roofs with well-adhered polyurethane or polyurea coating surfacing must be solvent-wiped with acetone after cleaning to reactivate surface for overcoating.

2. Flashing: Repair/Replace metal flashings, pitch pockets, etc.
3. Primer:
   a. Prime entire roof surface with Rust-Go Primer rust inhibitive primer at 1/2 gallon per 100 SF.
4. Reinforcement: Treatment of field seams and around penetrations:
   a. Application of UniBond ST seam tape with Base Coat on metal panel end laps, flashings and around penetrations.
      1) Verify that the surface to be coated is properly prepared.
      2) Remove the clear release liner from the back in workable sections
      3) Center 6 inch wide UniBond ST over the middle of the lap.
      4) Use care to install the tape uniformly. Do not stretch or cause air pockets, wrinkles or fishmouths.
      5) Apply pressure to tape starting at the center and work toward outside edge with a steel roller to activate the bonding process.
      6) Inspect the tape to ensure that it is properly installed. Verify edges are tightly fixed to surface. If any discrepancies are present, repair before the coating is applied.
      7) Saturate the tape with coating or baser as specified.
5. Coating: Ensure the fluid-applied coverage rates are obtained throughout the entire roof surface.
   a. Material: Apply base coat in a uniform manner at 1.5 gallons per 100 SF over the entire roof surface. Allow to cure thoroughly, but no more than 72 hours. Apply a top coating over base coat at 1.0 gallons per 100 SF.
   b. Use special attention to coating flashings and other critical areas to build adequate membrane thickness.
   c. Use multiple coats on verticals or steep slopes to prevent sagging and to obtain the required total coverage rate.
   d. Apply to Garland's minimum membrane thickness over the entire roof surface.

3.4 REPAIR OF EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. General
   1. Repair flashing in accordance with the requirements/recommendations of the Membrane manufacturer and as indicated on the manufacturer's standard drawings. Provide system with base flashing, edge flashing, penetration flashing, counter flashing, and all other flashings required for a complete watertight system.
   2. Install and repair flashings concurrently with the roofing as the job progresses.
   3. Terminate flashings as required by the membrane manufacturer.

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

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 coating 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.

3.7 FIELD QUALITY CONTROL

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

B. Perform field inspection and [and testing] as required

C. Correct defects or irregularities discovered during field inspection.

3.8 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with 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. 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.

D. Notify Owner upon completion of corrections.

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

3.9 SCHEDULES

A. Primers:
   1. Rust-Go Metal Primer:
      a. Flash Point: 40 degrees F (4.4 degrees C) min
      b. Solids by Weight: 69.9% plus/minus 2.0%
      c. Solids by Volume: 52.5% plus/minus 2.0%
      d. Viscosity @ 77 degrees F (25 degrees C):70 plus/minus 5 KU

B. Reinforcement:
   1. UniBond ST: Fatigue resistant, polyester-faced adhesive tape.
      a. Tensile Strength 4500 psi.
      b. Elongation, 500%
      c. Low Temperature Flexibility, -70 degrees F (-56.6 degrees C).
      d. Service Temperature, -30 to 200 degrees F (-34.4 to 93.3 degrees C).
      e. Permeance ASTM 96b, .001 perms.
      f. Adhesion Greater than 20 ibs./in.

C. Coatings:
   1. Coating: Cool-Sil HB Gray Silicone Coating (Roller Grade): Single-component 100 %

silicone, liquid waterproofing membrane.
   a. Tensile Strength: ASTM D 412, 350 psi
   b. Elongation: ASTM D 412, 174%
   c. Flash Point: ASTM D 93, 141 degrees F min. (60.6 degrees C)
   d. Solids Content: ASTM D 2369, Typical 95%
   e. VOC: < 50 g/l
2. Coating: Cool-Sil HB White Silicone Coating (Roller Grade): Highly reflective, multi - purpose, single-component 100% silicone, liquid waterproofing membrane.
   a. Tensile Strength: ASTM D 412, 350 psi
   b. Elongation: ASTM D 412, 174%
   c. Flash Point: ASTM D 93, 141 degrees F min. (60.6 degrees C)
   d. Solids Content: ASTM D 2369, Typical 95%
   e. VOC: < 50 g/l
   f. Reflectance: 0.89
   g. Emittance: 0.90
   h. SRI: 113

D. Sealant.
1. Sealant: All-Sil: Low modulus, high extension/compression and excellent adhesion to most building materials s,
   a. Tensile Strength: ASTM D 412, 130 psi
   b. Elongation: ASTM D 412, 275%
   c. Solids Content: ASTM D 2369, Typical 95%
   d. VOC: < 50 g/l

END OF SECTION

SECTION 09800

ELASTOMERIC ACRYLIC WALL COATING

VENTURA UNIFIED SCHOOL DSITRICT

2026 ROOFING AND WATERPROOFING

PART 1 – GENERAL

1.1 SUMMARY

A. This specification is for a one component, low solvent, emulsified poly-resin architectural wall coating. It damp proofs and beautifies all types of exterior and interior masonry surfaces such as concrete, CMU, stucco and exterior insulating finishing systems (EIFS). Coating is to be applied over all walls that connect to the new roofing

A. SCOPE OF WORK

a. Pressure wash surface and remove all loose debris

b. Seal all cracks larger than 1/8” with Tuff Stuff sealant

c. Apply Tuff Coat dampproof wall coating in a two coat application applied at 1 gallon per 100sqft for a total of 2 gallons per square feet

1.2 SUBMITTALS

A. Product Data: Submit manufacturer’s standard submittal package including specification, installation instructions, and general information for each waterproofing material.

B. Applicator Qualifications: Submit a current qualified applicator certificate from the specified waterproofing manufacturer.

1.3 QUALIFICATIONS

A. Primary elastomeric coating materials shall be products from a single manufacturer. The primary manufacturer shall recommend any secondary materials. Manufacturer shall have a minimum of ten (10) years experience in the manufacturing of materials of this type.

B. Applicators shall have a minimum of five (5) years experience in the application of damp proofing materials of the type specified. Applicator shall be an authorized applicator from the specified damp proofing manufacturer.

C. Pre-bid Job Walk: Ten (10) working days prior to bid opening there is to be a mandatory pre-bid job walk. Anyone not attending the pre bid job walk will not be allowed to bid the project. All products considered an equal to the specified product or any changes in the scope of work or installation or specifications must be presented at the pre bid job walk. If a change in the specification is accepted, it will be considered as an alternate and will be presented as a bid amendment issued five (5) working days prior to the bid opening. No other changes to the specification or bid documents will be accepted.

D. Pre-Installation Conference: Just prior to commencement of the elastomeric coating system, meet at the site with a representative of the coating manufacturer. The elastomeric coating contractor, the general contractor, the architect and other parties affected by this section. Review methods and procedures, substrate conditions, scheduling and safety.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store all coating materials in the original unopened containers between 50° - 80°F (10° - 26°C) until ready for use.

B. Follow the special handling or storage requirements of the manufacturer for cold weather, hot weather, etc.

C. Safety: Refer to all applicable data, including but not limited to, MSDS sheets, PDS sheets, product labels, and specific instructions for specific personal protection requirements.

D. Ventilation: Provide adequate ventilation to prevent the accumulation of hazardous fumes during application.

E. Environmental requirements: Proceed with work of this section only when existing and forecasted weather conditions will permit the application to be performed in accordance with the manufacturer's recommendations.

1.5 WARRANTY

A. The contractor shall guarantee that all work performed will be free from defects in materials and workmanship. The contractor is to provide a two (2) year labor/workmanship warranty. Upon notice of defect in writing, the contractor within one year after completion of work shall, at his own expense, make all necessary repairs or replacements of the defective work in question.

B. A five (5) year, material warranty is available with this system provided it has been installed by a Garland Approved Applicator and is installed according to this specification.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. The design is based upon coating systems engineered and manufactured by The Garland Company or approved equals:

The Garland Company
3800 East 91st Street
Cleveland, Ohio 44105
Telephone: (800) 762-8225
Website: www.garlandco.com

2.2 MATERIALS

A. Emulsified Acrylic Coating: Tuff-Coat for damp proofing and beautifying all types of exterior and interior masonry surfaces such as concrete, masonry, stucco and exterior insulation finish systems (EFIS).

Tuff-Coat has the following physical properties:

Tensile Strength: 400 psi (ASTM D-2370)

Elongation: 130% (ASTM D-2370)

Water Vapor Permeability @ 15 mils: 7-8 Perms (ASTM D-1653)

Solids by Volume: 47.4%

B. Hybrid Sealant: Green-Lock Sealant XL or Tuff-Stuff MS single-component sealant for joints and cracks in substrate surfaces.

C. Nontoxic Biodegradable Cleaner: B-Clean is a heavy-duty chemical formulation designed to clean a variety of masonry substrates including: concrete, brick, stone, aggregate, and block surfaces.

D. Misc. Accessories: All items incorporated into this system shall be compatible with and approved by coating manufacturer.

NOTE: Allow additional material for rough or irregular surfaces and up to 10% for material loss during application and differences in substrate porosity.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that substrate is ready to receive work; surface is clean, dry and free from projections and depressions, loose scale, sand, curing compounds, grease, oil, asphalt, loose coatings need removed and other foreign deposits.

B. Do not begin work until concrete substrate has cured 28 days, minimum. Water cured treatment of concrete is preferred. Resin or water based curing compound should not be used. Non-compatible curing agents must be removed prior to application.

C. The work shall not be started when temperature is under 50°F (10°C) or when precipitation is imminent.

D. Verify that all other work involved with this area, done under other sections, has been completed and accepted by the architect and general contractor prior to starting the waterproofing application.

E. Concrete surface pH level must not be higher than 11 prior to coating.

F. Damaged areas of concrete, masonry, mortar joints, EFIS, Stucco should be repaired prior to coating.

3.2 PREPARATION

A. Clean substrate to remove any and all surface contaminants. Surfaces to be coated must be cleaned to a sound surface. Refer to your Garland representative for specific preparation techniques. Mock-ups should be performed to determine adequate cleaning and ensure no compatibility issues or staining of the substrate if cleaning products are used for substrate prep.

B. Mask-off all adjoining areas that are not to receive the elastomeric wall coating.

C. Provide a suitable workstation to mix the coating materials.

D. Concrete: Special attention should be given to smoothness of surface and freedom from contaminants, including paint or previous coatings. Consult your Garland representative for alternate procedures for coating over existing paint. Such procedures are highly dependent on specific job conditions. Curing compounds, if used, shall be removed either by blast media or etching. In the event specifications are not met, the following corrective procedures are recommended.

E. Cleaning Methods:

1. Nontoxic Biodegradable Cleaner: Nontoxic Biodegradable Concrete & Masonry Cleaner: Scrape, sand, or wire brush all hard or glossy surfaces and residual contaminants to assure effective cleaning. Use the most abrasive methods necessary to remove all contaminants that will inhibit the cleaning solution from properly saturating the substrate.
   Rinse the substrate to be treated thoroughly with clean water to remove excess debris and dampen the surface. Beginning at the top of the substrate working down to the bottom, generously apply the B-Clean solution directly to the affected areas using overlapping patterns. Allow the solution to soak into surface for 20-30 minutes. Do NOT allow surface to dry. Reapply a light mist of the solution intermittently to ensure the surface remains damp. Depending on the degree of contamination and exposure a stiff bristle brush may be required once the solution reacts. Next, using overlapping patterns rinse the surface from top to bottom with water. Additional applications may be required dependent upon the severity of the contaminant, using the same approach as above. Allow the substrate sufficient time to dry prior to installing wall coating.

2. Solvent & Acid Cleaners: Wipe up grease or oil with a solvent and absorbent material. Disposal of this material should be in accordance with local laws and codes. Wash with solvent-alkaline cleaners diluted one part cleaner and five parts water. Rinse thoroughly with clean water. If evidence of oil film remains as indicated by water “beading,” etch surface with 10% solution muriatic acid. Agitate surface with stiff bristle broom; then rinse with clean water.
   Remove curing compounds by etching with 10% muriatic acid followed by clean water rinse. Allow to thoroughly dry before applying coating. Grinding or sandblasting can remove heavy deposits of contaminants. Any residual traces of asphalt stains must be sealed with an epoxy primer to avoid staining of light colored top coats. Apply primer in two (2) coats and allow a minimum of 48 hours cure time.

F. Cracks less than 1/16” (1.5 mm) wide will require a detail coat of Tuff Coat after cleaning has been performed. Crack shall be cleared of all loose debris, dirt and widened slightly at the surface to accommodate new coating. Apply a 4” wide detail coat of Tuff Coat over crack and allow time to cure.

G. Cracks 1/16” (1.5 mm) to 1/8” (3.0 mm) wide shall be routed to a ¼” x ¼”. Crack shall be cleared of all loose dirt and debris and caulked with elastomeric hybrid sealant. Fill grooves flush with adjacent surfaces. Apply a 4” wide detail coat of Tuff Coat over crack and allow time to cure.

H. Remove and replace all existing sealant including window/door/louver perimeter sealant, control/expansion joints, previously repair cracks, etc. with new sealant.

I. All sealed expansion joints or sealant repairs must be stripe coated with a half inch nap roller or approved brush extending the coating a minimum of 2 inches past the perimeter of the joints sealant ensuring a good protective base of the elastomeric coating is present.

J. Repair and damage or deficiencies in substrates to receive new wall coating.

3.3 INSTALLATION

A. Technical Advice: The installation of this elastomeric coating system shall be accomplished in the presence of, or with the advice of the manufacturer's technical representative.

B. Elastomeric Coating: Apply Tuff-Coat to secure a total minimum coverage of 2 gallons per 100 square feet (total wet film thickness 32 mils). Product shall be applied by phenolic core roller or airless spray at a rate of 100 sq. ft. per gallon depending on the porosity and roughness of the surface with a minimum two (2) coat process.

3.4 FIELD QUALITY CONTROL

A. The contractor for work under this section shall maintain a quality control program specifically to verify compliance with this specification. A daily log shall be kept to record actions in the field.

B. Inspections: A minimum of three (Substrate, Application and Final) inspections by an approved manufacturer's representative, will be required on all projects requiring a warranty.

C. Material Coverage Rates.
   1. At beginning of application, calibrate material coverage rate with wet-mil thickness equivalent to minimum specified dry-mil thickness. Measure wet-mil thickness with thickness gauge.
   2. Measure wet-mil thickness at least once for every 200 square feet of surface coated. Adjust coverage rate to maintain minimum thickness.

D. Owner may, at its expense, perform the following tests. Contractor shall provide access to test locations determined by the Owner.
   1. Measure dry-film thickness of coating. Coating thickness is acceptable if within specified range.
   2. Perform adhesion tests per ASTM D3359, Test Method A, after coating has cured. Coating adhesion is acceptable if no peeling or coating removal occurs (Rating 5A).
      Perform pull-off tests per ASTM D4541, after coating has cured. Coating application is acceptable if test results are at least 100 pounds per square inch.
   3. If coating application is acceptable, Owner will pay Contractor to repair substrate and coating as necessary at test locations.
   4. If coating application is unacceptable, Architect/Engineer will determine remedy. Contractor shall remove and replace unacceptable coating or perform other remedial actions at no cost to Owner. Contractor shall also repair substrate and coating at test locations with unacceptable results at no cost to Owner. Contractor may, at own expense, perform additional measurements and testing to determine limits of areas with unacceptable coating.

E. Completed Work shall match approved mockup for color, texture, and coverage, in opinion of Architect/Engineer, and shall be free from flow-lines, streaks, blisters, and other surface imperfections. Remove, refinish, or recoat Work not complying with specified requirements.

3.5 FIELD QUALITY CONTROL

A. At the end of each workday, clean Site and Work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.

B. After completing coating Work:
    1. Clean spillage, overspray, and spatter from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected surface. Exercise care to avoid scratching or damage to surfaces.
    2. Repair surfaces stained, marred, or otherwise damaged during coating Work.
    3. Clean up debris and surplus materials and remove from Site.

C. Waste Management:
    1. Collect surplus coating materials that cannot be reused and deliver to recycling or disposal facility.
    2. Treat materials that cannot be reused as hazardous waste and dispose of in an appropriate manner.

END OF SECTION