SECTION 07500
ROOFING SPECIFICATIONS

PART I - GENERAL

1.01 RELATED DOCUMENTS

A. The attached are components of this section:
   1. General Conditions
   2. Supplemental Conditions
   3. Statement of roofing material manufacturer's qualifications
   4. Pre-final inspection checklist for Roofing Contractor

B. Contractor requirements prior to work proceeding and application.
   1. Contractor to determine if moisture is present in system.

1.02 SCOPE OF WORK

A. Furnish and install specified roofing and related components to Monte Vista Elementary School Buildings, 3,4,5, and 6, with Building 6000 Lunch Shelter as Optional, Plus new gutters installation as Optional, and Dunsmore Elementary School Buildings F and G. All Roof Section Elevations as follows:
   1. **BUILDING ROOF AREAS:**
      a. **Roof Reinforcement and Coating System** consist of the following work:
         1) Power wash all existing roof system, and flashing areas, as necessary.
         2) Sweep and remove all loose granules.
         3) Contractor shall take protective measures to protect conduits, units, roof equipment from overspray during application of roofing materials.
         4) Prime existing membrane prior to all field, wall, or flashing repairs with Water Based Asphalt Primer at a rate of one gallon per 100 square feet.
         5) Repair all roof membrane and flashing splits or tears with a five-course application of Solargard White Acrylic Sealer/Mastic and Permafab Membrane.
         6) Seal all Hypalon Seams with a three course of Solargard White Acrylic Mastic and Permafab Membrane.
         7) Seal the base of the Hypalon Flashing with a Two Course of Solargard Seam Sealer and Permafab or Burmesh Membrane
         8) Seal perimeter metal edge with Solargard Seam Sealer.
         9) Reinforce all center crowns of roof sections with a half and full Ply of Rapid Set Polyester reinforcement membrane set into specified Tremlastic Elastomeric Emulsion. Apply emulsion at a rate of 4½ to 5 gals. Per square.
         10) Seal metal counter flashing reglet with Tremseal Pro.
         11) Seal all pipe and metal penetrations with a 2-course of reinforcing membrane and Solargard White Acrylic Sealer/Mastic and Permafab Membrane.

12) Seal all field laps and seams with Solargard Seam Sealer and Permafab Membrane.
13) Replace all blocking as required.
14) Prime the roof surface with Tremprime WB Primer, at a rate of one gallon per 100 square feet.
15) Apply ICE White Roof Coating over all roof membrane and flashing areas, at a rate of Three and One Half0 (3½) gallons per 100 square feet. Application shall be applied in two separate coats of two gallons per square each.

2. OPTIONAL APPLICATIONS – TO BE BID SEPARATELY

a. Building 6000 Lunch Shelter:
   1) Complete all field repairs as outlined above.
   2) Remove Excess gravel from field.
   3) Three course the raised perimeter metal edge with Solargard Acrylic Mastic and Permafab Membrane.
   4) Clean the surface of the remaining gravel by washing or blowing clean.
   5) Prime the surface with Tremprime WB at ½ per square.
   6) Apply Rock-it Adhesive at 6 gallons per square, and embed Tremco White Rock at two to three hundred pounds per square.

b. Buildings 3000, 4000, and 5000
   1) Remove existing gutters.
   2) Replace gutters with minimum 22-gauge metal to match existing gutter in size, configuration, and attachment.

1.03 QUALITY CONTROL

A. Contractor shall:
   1. Be experienced in cold process coating and built-up roofing. 5 years' minimum.
   2. Be acceptable by the GLENDALE UNIFIED SCHOOL DISTRICT.
   3. Be a Manufacturer Certified or Approved Contractor.
   4. Has not been in Chapter 7 during the last ten (10) years.
   5. Provide list of at least 5 projects available for inspection employing same system within 100-mile radius of the GLENDALE UNIFIED SCHOOL DISTRICT.

B. Roofing material supplier shall:
   1. Be Associate Member in good standing with National Roofing Contractors' Association (NRCA) for at least five (5) years.
   2. Be nationally recognized in roofing, waterproofing, and moisture survey industry.
   3. Be approved by GLENDALE UNIFIED SCHOOL DISTRICT.
   4. Has not been in Chapter 11 during the last five (5) years.
   5. The GLENDALE UNIFIED SCHOOL DISTRICT is desirous of working with a financially strong organization, which has the ability to protect and insulate the GLENDALE UNIFIED SCHOOL DISTRICT from both product liability and warranty claims, relating to roofing that could be brought before the GLENDALE UNIFIED

SCHOOL DISTRICT during the course of the roofing warranty period. Financial strength of suppliers is a requirement of the GLENDALE UNIFIED SCHOOL DISTRICT proof of such must be shown. To this end, the following information is required by the GLENDALE UNIFIED SCHOOL DISTRICT:

a. The manufacturer must present to the GLENDALE UNIFIED SCHOOL DISTRICT a certificate of insurance for product liability with minimum limits of $25 million.
b. The manufacturer must have a current net worth in excess of $50 million and verify such by an affidavit from a corporate officer.

6. The GLENDALE UNIFIED SCHOOL DISTRICT is a supporter of responsible Health, Safety and Environmental issues and requires all manufacturers to have similar concerns, convictions and commitments. To this end, the primary manufacturers of materials used on GLENDALE UNIFIED SCHOOL DISTRICT roof must submit a formalized Corporate HS & E Policy and demonstrate active participation in such a policy.
7. The GLENDALE UNIFIED SCHOOL DISTRICT, to assure that the manufacturer can consistently deliver quality materials, requires the manufacturer to provide evidence of twenty (20) quarters of continuous plant inspections of roofing manufacturing sites over the past five (5) years by an independent Nationally Recognized Testing Laboratory (NRTL) as defined in 29 CFR Ch. XVII (7-1-93 Edition) from the Occupational Safety and Health Administration (OSHA).
8. Provide GLENDALE UNIFIED SCHOOL DISTRICT names of at least 5 qualified applicators.
9. Employ full-time Field Technical Services Representative available for final roof inspection.
10. Provide local Field Representative to make periodic site visits, report work quality and job progress.
11. Provide list of at least 10 projects available for inspection employing same roofing system within 25-mile radius of GLENDALE UNIFIED SCHOOL DISTRICT.
12. The presence and activity of the manufacturer's/specifier’s representative and/or GLENDALE UNIFIED SCHOOL DISTRICT's representative shall in no way relieve the contractor of contractual responsibilities or duties.
13. Roofing material manufacturer shall provide to the GLENDALE UNIFIED SCHOOL DISTRICT a Project Close-Out Book/Report upon delivery of the project warranty. This book/report shall include the following sections:
    a. Project Warranty
    b. Project Specifications
    c. Project Summary
    d. Job Progress Photos
    e. Project Inspection Reports
    d. Owner’s Manual describing maintenance and emergency repair.
    e. Inspection Report to be completed by the roofing material manufacturer two (2) years from the project completion.

C. Project meetings:
    1. Pre-Bid Conference:
        a. Will be held at place and time determined by GLENDALE UNIFIED SCHOOL DISTRICT.

b. Attendance:
   1) Roofing material supplier/specifier
   2) Contractor
   3) GLENDALE UNIFIED SCHOOL DISTRICT.
c. Agenda:
   1) Distribution of contract documents.
   2) Review of specification.
   3) Walkover inspection.

2. Pre-construction conference:
   a. Will be scheduled by GLENDALE UNIFIED SCHOOL DISTRICT within fifteen (15) days after notice of award.
   b. Attendance:
      1) Roofing material supplier/specifier
      2) Contractor
      3) Representative of GLENDALE UNIFIED SCHOOL DISTRICT.
   c. Agenda:
      1) Submittal of insurance certificates.
      2) Submittal of executed bonds.
      3) Payment terms.
      4) Execution of GLENDALE UNIFIED SCHOOL DISTRICT-Contractor Agreement.
      5) Distribution of contract documents.
      6) Submittal of list of subcontractors, material submittal, and progress schedule.
      7) Designation of responsible personnel.
      8) Walkover inspection.
3. Progress meetings:
   a. Will be scheduled by GLENDALE UNIFIED SCHOOL DISTRICT as required.
   b. Attendance:
      1) Roofing material manufacturer/specifier/ contractor.
      2) Job superintendent.
      3) Subcontractors, as appropriate.
      4) GLENDALE UNIFIED SCHOOL DISTRICT.
   c. Minimum agenda:
      1) Review of work progress.
      2) Field observations, problems, and decisions.
      3) Identification of problems which impede planned progress.
      4) Maintenance of progress schedule.
      5) Corrective measures to regain projected schedules.
      6) Planned progress during succeeding work period.
      7) Coordination of projected progress.
      8) Maintenance of quality and work standards.
      9) Effect of proposed changes on progress schedule and coordination.
      10) Other business relating to work.
4. Final inspection:
   a. Will be scheduled by roofing material manufacturer upon job completion.
   b. Attendance:

1) Contractor.
2) Roofing material manufacturer/specifier.
3) GLENDALE UNIFIED SCHOOL DISTRICT.

c. Minimum agenda:
1) Walkover inspection.
2) Identification of problems which may impede issuance of warranty.

D. Random sampling:
1. Roofing material:
a. During course of work, GLENDALE UNIFIED SCHOOL DISTRICT's Representative may secure samples according to ASTM D140-88 of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.
b. Should test results prove that a material is not functionally equal to specified material.
1) Contractor shall pay for all testing.
c. Roofing installed and found not to comply with the specifications shall be removed and replaced at no change in the contract price.

E. Regulatory requirements:
1. Uniform Building Code.
a. Replacement Roof - UL 790. - Class A.
b. Reinforcement Roof System – Will match existing UL Rating.
2. California Building Energy Efficiency Standards
a. Cool Roof Rating Council (CRRC) Title 24.

F. Plans and specifications:
1. Contractor must notify GLENDALE UNIFIED SCHOOL DISTRICT and specifier of any omissions, contradictions or conflicts seven (7) days before bid date. GLENDALE UNIFIED SCHOOL DISTRICT and specifier will provide necessary corrections or additions to plans and specifications by addendum. If contractor does not so notify GLENDALE UNIFIED SCHOOL DISTRICT and specifier of any such condition, it will be assumed that the contractor has included the necessary items in the bid to complete this specification.
2. It is the intent that this be a completed project as far as the contract documents set forth. It is not the intent that different phases of work on this project be delegated to various trades and subcontractors by the contract documents. Contractor must make own contracts with various subcontractors, setting forth the work these subcontractors will be held responsible for. Contractor alone will be held responsible by the GLENDALE UNIFIED SCHOOL DISTRICT for the completed project.
3. If the contractor feels a conflict exists between what is considered good roofing practice and these specifications contractor shall state in writing all objections prior to submitting quotations.
4. It is the contractor's responsibility during the course of the work, to bring to the attention of the GLENDALE UNIFIED SCHOOL DISTRICT's representative any defective membrane, insulation or deck discovered where not previously identified.

1.04 SUBMITTALS – NONE TREMCO MATERIALS

A. Submit at Pre-Construction Conference:
   1. Product compatibility:
      a. Written verification from roofing material supplier that major roofing components, including (but not limited to) coatings, cold process adhesives; roofing ply sheets; reinforcement fabric felts and mats; mastics; and sealants are all compatible with each other.
   2. Test reports:
      a. Written verification from roofing material supplier that roofing system meets or exceeds regulatory agency/s requirements.
   3. Red label products:
      a. Written verification from roofing material supplier that cold process coatings are not red label.
   4. Product data:
      a. Product data sheets.
      b. Material safety data sheets.
      c. Samples of coatings, adhesives, and roofing ply sheets.
      d. Samples of each material specified, properly labeled.
      e. List of 5 local projects where the specified roof system has been installed. Provide location, contact name, and telephone number.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery of materials:
   1. Deliver materials to job-site in new, dry, unopened, and well-marked containers showing product and manufacturer's name.
   2. Deliver materials in sufficient quantity to allow continuity of work.
   3. Coordinate delivery with GLENDALE UNIFIED SCHOOL DISTRICT.

B. Do not order project materials or start work before receiving GLENDALE UNIFIED SCHOOL DISTRICT's written approval.

C. Storage of materials:
   1. Store roll goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place materials on pallets. Do not stack pallets.
   2. Stack insulation on pallets.
   3. Store materials marked "keep from freezing" in areas where temperatures will remain above 40 F (5 C).
   4. For insulation, remove plastic packaging shrouds. For felt rolls, slit the top of the plastic shrink wrap only. Cover top and sides of all stored materials with tarpaulin (not polyethylene). Secure tarpaulin.
   5. Rooftop storage: Disperse material to avoid concentrated loading.
   6. No materials may be stored in open or in contact with ground or roof surface.

7. Should Contractor be required to quickly cover material temporarily, such as during an unanticipated rain shower, all materials shall be stored on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom.
8. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

D. Material handling:
1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.
3. Cold Process Trilaminate Ply Sheet: Do not remove packaging tubes until roll is ready for use.

1.06 SITE CONDITIONS

A. Field measurements and material quantities:
1. Applicator shall have SOLE responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

B. Existing conditions:
1. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt GLENDALE UNIFIED SCHOOL DISTRICT operations unless prior written approval is received from GLENDALE UNIFIED SCHOOL DISTRICT.
2. Access to roof shall be from exterior only.
3. Air-conditioning units and other equipment shall be moved as required to install roofing materials complete and in accordance with plans and specifications. When units and equipment are to be moved, they shall be carefully disconnected and removed to a protected area so as not to damage any part or component thereof, and shall be reconnected in such a way that they are restored to a prior work operating condition. Appropriate measures shall be taken to prevent dust, vapors, gases or odors from entering the building during roof removal, replacement or repair.
4. All disconnection and re-connection shall be performed by a mechanical and/or electrical company licensed to perform such work.

C. Safety requirements:
1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and GLENDALE UNIFIED SCHOOL DISTRICT fire and safety requirements.
3. Advise GLENDALE UNIFIED SCHOOL DISTRICT whenever work is expected to be hazardous to GLENDALE UNIFIED SCHOOL DISTRICT, employees, and/or operators.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.

5. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.

D. Waste Disposal:
1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

E. California Proposition 65:
1. Contractor will post all notices, make all communications and otherwise comply with California Proposition 65 requirements concerning notification of those who may be exposed to Prop 65 listed chemicals, as revised from time to time. Contractor will also comply with other requirements concerning the safe use and handling of roofing materials, including preventing vapors from entering buildings.

F. Environmental requirements:
1. Do not work in rain, or in presence of water.
2. Do not work in temperatures below 40 F (4.44 C).
3. Do not install materials marked "keep from freezing" when daily temperatures are scheduled to fall below 40 F (4.44 C).
4. Do not perform masonry work below 40 F (4.44 C).
5. Remove any work exposed to freezing.
6. Advise GLENDALE UNIFIED SCHOOL DISTRICT when volatile materials are to be used near air ventilation intakes so that they can be shut down or blocked as GLENDALE UNIFIED SCHOOL DISTRICT requires.

G. Security requirements:
1. Comply with GLENDALE UNIFIED SCHOOL DISTRICT security requirements.
2. Require identification be displayed by all persons employed on this project.

H. Temporary sanitary facilities:
1. Furnish, install, and maintain temporary sanitary facilities for employee use during project. Remove on project completion.
2. Place portable toilets in conformance with applicable laws, codes, and regulations.

1.07 SUBSTITUTIONS

A. When a particular make or trade name is specified, it shall be indicative of standard required. Bidders proposing substitutes shall submit the following 14 days prior to bid date to GLENDALE UNIFIED SCHOOL DISTRICT:
1. Written application with explanation of why it should be considered.
2. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified.

B. Only substitutes approved in writing by GLENDALE UNIFIED SCHOOL DISTRICT prior to scheduled bid date will be considered.

C. Notification of approvals will be mailed at least 7 days before bid opening.

D. GLENDALE UNIFIED SCHOOL DISTRICT reserves right to be final authority on acceptance or rejection of any substitute.

1.08 PAYMENT SECURITY

A. Any of the following:
   1. Payment & Performance Bonds: Contractor purchases Payment and Performance Bonds for benefit of Owner and material supplier. Bonding company/surety shall be rated B+ or better in current Key Rating Guide as issued by A. M. Best Co., Oldwick, NJ.

B. Progress payments:
   1. Contractor shall establish with Owner, Owner's procedure for payment and retainages prior to commencement of work on this project.
   2. Partial or progress payments shall not relieve Contract r of performance obligations under this contract, nor shall such payments be viewed as approval or acceptance of work performed.
   3. Final payment shall be withheld until all provisions of the specifications are met.

1.09 WARRANTY/GUARANTEE

A. Guarantee:
   1. Upon project completion and Owner acceptance, effective upon complete payment, Contractor shall issue Owner a guarantee against defective workmanship and materials for a period of three (3) years.

B. Warranty and Service Agreement:
   1. Upon project completion, Roofing Manufacturer, acceptance, and once complete payment has been received by both Contractor and Roofing Manufacturer, Roofing Manufacturer, shall deliver to Owner a Ten (10) Year Roofing Manufacturer Coating Warranty and Plus Service Agreement. Roofing Manufacturer, will, during the second and fifth year of this warranty service agreement, provide the following for the Roofing Manufacturer, Roof System:
      a. Warranty Coverage Includes:
         (1) The Roof Membrane
         (2) The Roof Flashing
         (3) Edge Components
         (4) Metal Components
      b. Inspection by a Roofing Manufacturer, Technical Service Representative and delivery of a written inspection report documenting roof conditions.
      c. Preventive maintenance and necessary repairs, including splits, tears, or breaks in the roof membrane system and flashings which threaten the integrity of the roof system and are not exempt due to neglect, negligence, vandalism, or some other exclusion.

d. General rooftop housekeeping and cleanup, subject to limits, but generally including removal of incidental debris.

C. Technical Service Inspection:

1. Roofing System Manufacturer to provide Technical Consulting Service for the installation of the Warranty System. Contractor to provide manufacturers Technical Service Inspectors are to review the installation procedures and materials. Contractor shall provide Ten (10) Days Technical Inspection days, at a cost of $ 800.00 per day to the contractor for Roof Restoration Project.

PART II - PRODUCTS

2.01 GENERAL

A. Comply with quality assurance provisions, references, specifications, and manufacturer's data. Where these may be in conflict the more stringent shall govern.

B. Products containing asbestos are prohibited on this project. Use only asbestos-free products.

C. Use products with personal protection. User must read container label and material safety data sheets prior to use.

D. All products shall bear UL, FM, and VOC criteria on labels.

2.02 BASIS OF DESIGN AND ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers shall meet or exceed all the requirements of these specifications.

B. Acceptable manufacturers shall meet or exceed material listed performance requirements.

C. Acceptable manufactures shall meet or exceed all specified warranties and maintenance requirements.

D. Manufacturer must submit current product data and Material Safety Data Sheets on all adhesives and mastics to ensure regulatory compliance.

E. Manufacturer must be in strict compliance with the system performance requirements and regulatory requirements as described in the specification. The GLENDALE Unified School District reserves the right to be final authority for acceptance or rejection of any substitutions.

F. Referenced Roofing materials from Tremlastic, Rapid Set Polyester, and TPA Single Ply system are listed to provide standard of required minimum quality.

2.03 ROOF DECKING

A. Concrete.

2.04 MECHANICAL FASTENERS AND ADHESIVES

A. Wood to wood:
   1. Galvanized, common, annular ring nail.
   2. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).

B. Wood to masonry:
   1. Anchor bolts, 1/2-inch (12.7 mm) diameter with 5/8-inch (15.9 mm) washer.

C. Wood to concrete:
   1. Deckfast #14 screw, by Construction Fasteners, Inc., Wyomissing, PA.
   2. Insul-Fixx #14, by Fabco RIF, Elyria, OH.
   3. Kwik-Deck screw, by Atlas Bolt & Screw, Ashland, OH.
   4. Olympic Fastener #14-10, by Olympic Manufacturing Group, Agawam, MA.
   5. Rawl Deck #14 Deck Screw, by The Rawlplug Co., Inc., New Rochelle, NY.
   6. Length: Sufficient to provide 1-1/2-inch (38 mm) embedment.

D. Galvanized sheet steel to wood blocking:
   1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.
   2. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.

E. Galvanized sheet steel to galvanized sheet metal. (Counterflashing extensions)
   1. Self-tapping sheet metal screws of 1/2-inch length and a minimum #3 diameter, with 5/8" steel/EPDM washer under head.

F. Termination bar to masonry/concrete:
   1. Lead masonry anchors.
   2. Length: Sufficient to provide 1-1/4 inches (32 mm) embedment minimum.

G. Drawband:
   1. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.
   2. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

H. Dens-Deck Prime to concrete deck:
   1. Water Based Primer.
   2. Solvent Free Insulation Adhesive.

2.05ROOFING MATERIALS

A. **Roof Membrane Reinforcement System for Flashing, Curbs, Drains, and Base.**
   1. Adhesives:
      a. Base Ply Adhesive:
         1) SBS Tremlastic Asphalt Elastomeric Emulsion.
      b. Interply adhesive:

1) Elastomeric emulsion.
c. Surfacing:
1) White high solids water based elastomeric coating with acrylic polymers.
2. Polyester Reinforcement Ply
a. Stitch Bonded Polyester – with Quick Cure Additive.
3. Roof Coating:
a. Energy Star & CRRC Listed, Title 24 Compliant, ICE Coating

B. **Roof Replacement System.**
1. Insulation:
a. Polyisocyanurate Insulation.
b. Temple Inland Fiberboard
2. Adhesives:
a. Interply adhesive:
1) Cold Asphalt LV Adhesive.
3. Roof Membrane:
a. 33lb. Glass Base Sheet
b. 28lb. Glass Base Sheet
c. FR Rated SBS Granulated Membrane
4. Membrane:
a. Rapid Set Polyester Sheet.
b. Permafab Membrane.
c. Burmesh Membrane.
5. Metal Edge:
a. Tri-Polymer Coated Metal.

C. Related roofing materials:
1. Elastomeric mastic:
a. Solargard White Acrylic Seal Sealer Mastic.
b. Solargard White Seam Sealer.
2. Asphalt primer - Water Based:
a. ASTM D 1644-88.
3. Flashing adhesive:
a. Asphalt Elastomeric Emulsion.
4. Flashing Sheet:
a. Polyester Reinforcing Membrane, quick setting
5. Flashing tape for pressure bar:
a. Butyl based sealant tape.
1) 1/8" X 1" X 50'.
6. Projection coating:
a. White high solids water based elastomeric coating with acrylic polymers.
7. Drawband and small joint sealant:
a. FS TT-S-00230C(2), single component, polyurethane sealant.
8. Hypalon flashing edge sealant:
a. ASTM C 719-86; single component, silicone sealant. Color: White.
9. Sealant Primer:

a. Sealant Manufacturer approved primer; all surfaces.

10. Metal Cleaner:
    a. Sealant Manufacturer approved cleaner.
11. Reinforcing mesh ply:
    a. Non-shrinking, non-rotting, woven glass mesh.
12. Walkway panels:
    a. 3 ft. x 5 ft. (915 mm x 1530 mm), granule surfaced, fiberglass reinforced panel.

2.06 METAL FLASHINGS

A. Termination bar:
   1. Galvanized steel bar:

B. Termination bar sealant:
   1. Metal primer: Sealant Manufacturer approved.
   2. FS TT-S-00230C(2), single component, polyurethane sealant.

C. Counterflashing and counterflashing extensions:
   1. Galvanized Steel: ASTM A 526-85, sheet steel with 1.25 oz./sq. (3.82 g/m^2) Galvwash ready to paint surfacing.
      a. Gage: Twenty-four (24).
      b. Solder: ASTM B32-89, alloy grade 50A. Neutralize flux after soldering.

2.07 SYSTEM PERFORMANCE REQUIREMENTS:

A. ASPHALT ELASTOMERIC EMULSION

Property	Typical Value	Test Method
Tensile strength	38psi (262 kPa)	ASTM D412-98a
Elongation @ 77 F min.	800%	ASTM D 412-98a
Density @ 77 F	8.4 lb./gal (0.98 kg/L)	ASTM D2939-98
Residue by evaporation	50%	ASTM D 2939-98
Asbestos content*	None	EPA/600/R-93/116
VOC*	50 g/L	ASTM D3960-93

* Volatile Organic Compound

B. NON-SHRINKING, NON-ROTTING WOVEN GLASS STRIPPING PLY MESH

Property	Typical Value	Test Method
Weight	0.065 kg/m^2 (1.32 lb/100 ft^2)	ASTM D 146-90
Moisture based on net weight	None	ASTM D 146-90
Average tensile strength @ (70 F)		
Wrap threads	289 N (65 lbf)	ASTM D 146-90
Filling threads	311 N (75 lbf)	ASTM D 146-90
Weight	18.7%	ASTM D 579-90
Type	PVC/acrylic	
Color	Aqua green	

C. RAPID SETTING POLYESTER REINFORCEMENT PLY

Property	Typical Value	Test Method
Weight	3.1 lb/100 ft^2 ($150g/m^2$)	ASTM D 3776-85 (1990)
Thickness	0.018 in. (0.46mm)	ASTM D1777-64 (1975)
Breaking force (grab) @77 F (25 C) (1" jaw)	72 lbf (320N)wrap	ASTM D-5034-90
Elongation @ 77 F (25 C) @ Max force	15% wrap 39% fill	ASTM D-5034-90

D. WATER BASED ASPHALT PRIMER (To existing roof, prior to elastomeric emulsion application)

Property	Typical Value	Test Method
Asbestos content	None	ASTM D276-87
Viscosity @ 25 C (77 F [Stormer Kreb]	50 KU	ASTM D562-81
Density @ 25 C (77 F)	1.05 kg/L (8.5 lb/gal)	ASTM D1475-85
Nonvolatile Content	32%	ASTM D1644-88
Flash point	Not Applicable	ASTM D3278-82
VOC*	65 g/L	ASTM D3960-89

* Volatile Organic Compound

E. WHITE REFLECTIVE SURFACEING

Property	Typical Value	Test Method
Density at 77 F (25 C)	6.4 lbs/gal ($767 kg/m^3$)	ASTM D 1475-90
Viscosity at 77 F (25 C)	11,800 cP (11.8 Pa s)	ASTM D 2196-86 (1991)
Non-volatile content	62% by weight	ASTM D 1644-88
Percent solids	70% by volume	ASTM D 5201-91
VOC	None	ASTM D 3960-89
Asbestos content	None	EPA 600/R-93/116

F. ONE-COMPONENT POLYURETHANE SEALANT

Property	Typical Value	Test Method
Hardness (Shore A)	40	ASTM C 920-02
Bond Durability	Pass	ASTM C 920-02
Stain & Color Change	none	ASTM C 920-02

Accelerated Weathering	Pass	ASTM C 920-02
VOC	85g/L	ASTM C 920-02
VOC	<4%	CARB Consumer Product Method 310

PART III - ROOF REINFORCEMENT AND REPLACEMENT AREAS - EXECUTION

3.01 EXAMINATION

A. Verify conditions as satisfactory to receive work.

B. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.

C. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by GLENDALE UNIFIED SCHOOL DISTRICT, manufacturer, and roofing contractor.

D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

3.02 GENERAL WORKMANSHIP

A. Substrate: Free of foreign particles prior to laying roof membrane.

B. Phased application: Not permitted. All plies shall be completed each day.

C. Traffic and equipment: Kept off completed plies until adhesive has set.

D. Wrapper and packaging materials: Not to be included in roofing system.

E. Entrapped aggregate: Not permitted within new membrane. Its discovery is sufficient cause for rejection.

F. Ply shall never touch ply, even at roof edges, laps, tapered edge strips, and cants.

G. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.

H. Seal all exterior walls, to the scupper drain joints with two-part polyurethane sealant.

I. Fit plies into roof drain rims; install flashing and finishing plies; secure clamping collars; install domes.

3.03 PREPARATION

A. Protection:
   1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to GLENDALE UNIFIED SCHOOL DISTRICT.
   2. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by GLENDALE UNIFIED SCHOOL DISTRICT.
   3. Roofing, membrane repairs, shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
   4. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
   6. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
   7. Protect building surfaces at chute/set-up areas with tarpaulin. Secure tarpaulin. Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster/chute shall be removed from premises. Spilled or scattered debris shall be cleaned-up immediately. Removed material to be disposed from roof as it accumulates.
   8. At end of each working day, removal areas shall be sealed with water stops along edges to prevent water entry.
   9. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.04 **ROOF PREPARATION**

A. Preparation:
   1. Clean the complete roof system of loose granules and debris.
   2. Wash the surface the roof system if necessary for installation of the restoration/coating system.
   3. Prime all areas of repair with Water Based Asphalt Primer.

B. Roof membrane and flashing preparation:
   1. Sweep clean roof membrane and all flashing and areas.
   2. Prime the entire area which is to be repaired (6” wide, minimum) with an application of water based asphalt primer, applied at rate of one (1) gallon per 100 square feet.
   3. Reinforce and seal any splits, un-adhered flashings, with a three-course application of White Acrylic Mastic embedded into reinforcing (6”) mesh, sealed over with mastic.
      a. Application of the mastic will be at rate of (½) pound per 100 square feet, per application course.
   4. Blisters and ridges:

a. Cut away delaminated felts until firmly laminated felts exist along every area to be repaired.
b. Remove debris, and dust from area extending at least (8 inches) beyond perimeter of depressed area. Square the corners.
c. Fill depression with alternating layers of asphalt mastic and asphalt ply sheet; match number of plies removed.
d. Cover layers of mastic/felt with two (2) layers of reinforcing mesh (6 inch) wide strips and one layer of (12 inch) wide strips embedded between trowel applications of asphalt mastic.
e. Extend repair area at least (6 inches) beyond filled depression. Overlap reinforcing mesh at least (2 inches). Cover mesh completely with mastic.

5. Install a 1-ply Tremlastic and Rapid Set reinforcing system to all drains, curbs, base, and perimeter flashing.

C. **ROOF REINFORCEMENT SYSTEM TO:** all roof membrane curbs, vents slopes, and flashings areas.
1. Apply water based asphalt primer at rate of 100 sq. ft. per gallon.
2. Roof membrane and flashings reinforcement system application:
a. Prior to application of the reinforcement system, the contractor will inspect the entire roof with the Roofing Manufacture's Representative for substrate approval.
b. Apply Elastomeric Emulsion to all base, curb, slopes, and wall flashing areas.
c. Roll or apply the membrane plies in shingle fashion into a single coating of elastomeric emulsion applied at a rate of four and one half (4½) gallons per one hundred (100) square feet and between each ply.
d. All plies will be dry broom or brush the membrane to eliminate all blisters and not allow any dry mesh in the new reinforcement membrane system.
h. All fishmouth and membrane deformities in the new membrane will be removed and repaired with equal plies of the polyester membrane and elastomeric emulsion. (To be installed as specified above.)

D. Surfacing:
1. Allow the reinforcement system to cure for twenty (24) hours.
2. Clean the entire roof membrane, flashings and parapet wall areas of all dirt and debris.
3. Prime the entire roof membrane, flashings and parapet wall areas with Water Based Primer to complete roof at 100 square feet per gallon. All areas primed must be allowed to dry and must have the white reflective coating applied the same day. Primed areas left over night to dry, must be re-primed the next day.
4. Over the entire primed area apply a base coat of white reflective roof coating at a rate of two (2) gallons per 100 square feet per coat. Two Coats Required. Allow to dry.
5. Over **all roof membrane and flashing areas** apply a final coat of white reflective roof coating at a rate of one and one half (1½) gallon per 100 square feet. Application shall be completed in two coats.
6. A total of 4 gallons per square is required

3.05 ADJUSTING AND CLEANING

A. Repair of deficiencies:
   1. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.

B. Clean-up:
   1. Immediately upon job completion, roof membrane and grounds shall be cleaned of project debris.

END OF DETAILED SPECIFICATIONS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

075419 Polyvinyl-Chloride (PVC/TPA) Roofing

TABLE OF CONTENTS:

SECTION 075419 - POLYVINYL-CHLORIDE (PVC/TPA) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Adhered thermoplastic PVC/TPA roofing system over wood deck.
2. Substrate board.
3. Dens-Deck Prime Roof Board.
4. Roof expansion joint.
5. Walkway material.
6. Tile Roof Repair.
7. Optional Gutter Replacement.
8. ***SCOPE OF WORK: TPA FULLY ADHERED 60 MIL ROOF SYSTEM***

a Remove existing roof systems wood Plywood/plank decks, at Keppel Elementary School Building 1000, Roof Sections A and B.

b. Remove the existing tile coping ridge from the perimeter parapet walls and slope areas, and save for re-installation. One or two rolls of tile may be necessary to remove for proper flashing installation.

c. Remove the existing metal coping or metal edge detail from the perimeters.

d. Remove and replace existing roof drains.

e. Remove existing roof hatch on Roof Section B, and repair the wood decking.

f. Designated non-functional roof equipment and penetrations to be removed and the wood deck repaired, this includes the expansion joint on Roof Section B.

g. Remove and replace all damage or deteriorated wood decking. Include in bid the cost per square foot for deck repair and replacement. All damaged decking must be confirmed to Glendale Unified School District: Mr. Raymond Mikaily, Project Manager.

h. Install tapered Insulation behind equipment and curbs to achieve proper water flow.

i. Install one layer of Tremco/GP Dens-Deck Prime One Half (1/2") Inch to the wood decks. Including all perimeter slope areas. Board mechanically fastened to the wood deck with Tremco # 1410 two (2") Mechanical Fasteners and two (2") inch flat plates. Install one fastener for every 2 square feet of the board.

j. Install a Class A, UL listed TPA - 60 Mil FB Single Ply membrane assembly, fully adhered to Tremco "Dens-deck" Primed 1/2 Inch Board.

k. Install and adhere the TPA FB 60 – Mil Membrane to the Dens-Deck with TPA Bonding Adhesive WB, at a rate of 80 square feet to a gallon.

l. Remove and replace all base, curb, and perimeter parapet wall flashing with TPA Flashing System. This includes all surface walls as part of the roof. Seal with TF-Tape and Termination Bars.

m. Remove and replace perimeter metal edge with Tremco TPA Metal. Install TPA Stripping Plies to the new metal edge.

n. Remove and replace perimeter metal counter flashing with new 24-gauge metal counter flashing to installed to existing reglet, and seal with Tremseal PRO.

o. Seal the top of all flashing membrane with Termination Bar and TF-Sealant Tape.

p. Remove and replace all through wall scuppers with new TPA Metal Scuppers, and line with TPA Flashing Membrane.

q. Install TPA Flashing System around all large round vents, and seal the tops with TF-Tape and Clamping Ring.

r. Install new TPA Flashing to the top of perimeter ridges.

s. Re-install Tile coping to ridge areas with concrete grout. Grout must be approved by the Glendale Unified School District.

t. Install TPA Walkway Panels (Gray 72 Mil) to designated areas. Include 4 Rolls as part of base bid.

u. Remove all pitch pans and replace with TPA Flashing Boots.

v. Seal wood supports with Solargard Seam Sealer, and install TPA Boots to wood supports.

w. Install new TPA Flashing to all roof penetrations.

x. Install TPA Flashing to all drain areas.

y. Install new L-Shape Expansion Joint to Roof Section B, with new 22-gauge sheet metal and TPA Flashing Membrane.

9. ***SCOPE OF WORK: BUILDING 1000 ROOF SECTIONS A & B TILE REPAIR***

a. Remove all existing broken or damage tile from the perimeter slope roof sections, and necessary tile to complete the repair.

b. Replace membrane underlayment in the areas of the broken or damage tile, and this includes areas of missing tile, with PowerPly Self Adhered Membrane Smooth.

c. Reinstall or replace tile to match existing tile in color, size, style, and shape.

10. ***OPTIONAL GUTTER APPLICATION/INSTALLAION SCOPE OF WORK***

a. Remove the existing perimeter gutter system and downspouts on Building 1000 A and B Roof Sections.

b. Install new gutters of 22-guage or better to the perimeter of Building 1000 A and B Roof Sections.

c. Gutters to match size and shape of existing gutters.

11. Division 06 Section " Miscellaneous Rough Carpentry " for wood nailers, curbs, and blocking.

12. Division 07 Section "Thermal and Moisture Protection Rehabilitation" for rehabilitation of related non-roof building components.

13. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.

14. Division 07 Section "Roof Specialties" for manufactured copings, roof edge flashings, roof edge drainage systems, counterflashings, and reglet.

15. Unit Prices: Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices. Unit prices for Wood Deck Repair and Replacement.

1.3 DEFINITIONS

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

1.4 ACTION SUBMITTALS – ONLY NON-TREMCO MATERIALS

A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.

1. Include letter from Manufacturer written for this Project indicating approval of Installer.

C. Warranties: Unexecuted sample copies of special warranties.

1.6 INFORMATIONAL SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section, UL listed for roofing systems identical to that specified for this Project, with minimum five years' experience in manufacture of specified products in successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.

b. Samples of each component.

c. Sample submittal from similar project.

d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.

e. Sample warranty.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products.

E. Pre-installation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review drawings and specifications.

3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.

6. Review structural loading limitations of roof deck during and after roofing.

7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

8. Review governing regulations and requirements for insurance and certificates if applicable.

9. Review temporary protection requirements for roofing system during and after installation.

10. Review roof observation and repair procedures after roofing installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

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

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

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

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer's Warranty: Manufacturer's standard or customized form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section, and meets QA Plus Warranty.

2. Warranty Period: 20 years from date of Substantial Completion. A, Manufacturer’s Job Site Consulting for project is 8 days at $ 800.00 per day, to the Roofing Contractor.

C. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of membrane roofing such as single ply roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Three years from date of Substantial Completion.

Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:

1. Sheet metal flashing and trim, including roof penetration flashings.

2. Manufactured copings, roof edge, counterflashings, and reglet.

3. Roof curbs, hatches, and penetration flashings.

4. Roof and parapet expansion joint assemblies.

5. Metal roof, wall, and soffit panels and trim.

E. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections and preventive maintenance is included in the Contract Sum. Inspections to occur in Years 2, 5, 10 and 15 following completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by a manufacturer meeting qualification requirements in Quality Assurance Article.

B. Basis-of-Design Manufacturer/Product: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products.

1. Tremco TPA FB 60 Membrane.

C. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Flashings and Fastening: Comply with requirements of Division 07 Sections “Sheet Metal Flashing and Trim” and “Roof Specialties.” Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:

1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.

2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings. Identify products with appropriate markings of applicable testing agency.

F. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

G. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

H. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

2.3 BASE SHEET MATERIALS

A. ASTM D 4601 Type II non-perforated SBS-modified asphalt coated fiberglass/fiberglass/ polyester reinforced high tensile strength sheet dusted with fine mineral surfacing on both sides.

1. Basis of design product: Tremco, Burmastic Composite Ply HT.

2. Tensile Strength, minimum, ASTM D 5147: Machine direction, 165 lbf/in (28.9 kN/m); Cross machine direction, 150 lbf/in (26.3 kN/m).

3. Tear Strength, minimum, ASTM D 5147: Machine direction, 210 lbf (0.9 kN); Cross machine direction, 185 lbf (0.8 kN).

4. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 5147: 6 percent.

5. Thickness, minimum, ASTM D 146: 0.055 inch (1.4 mm). B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft.

2.4 THERMOPLASTIC MEMBRANE MATERIALS

A. Thermoplastic PVC/TPA sheet, fleece-backed, ASTM D 4434 Type IV internally fabric reinforced, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant.

1. Basis of design product: Tremco, TPA FB Roof Membrane.

2. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 350 lbf/in (61 kN/m).

3. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (440 N).

4. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: Machine direction, 35 percent; Cross machine direction, 33 percent.

5. Minimum Thickness, nominal, less backings D 751: 60 mils (1.5 mm).

6. Exposed Face Color: White.

7. Reflectance, ASTM C 1549: 86 percent.

8. Thermal Emittance, ASTM C 1371: 0.86.

9. Solar Reflectance Index (SRI), ASTM E 1980: 108.

10. Recycled Content, minimum: 25 percent pre-consumer.

11. Acceptable Alternate Products: Subject to requirements, acceptable products include PVC Sheet: ASTM D 4434/D 4434M, Type III, fabric reinforced and fabric-backed, or KEE Sheet: ASTM D 6754/D 6754M, fabric reinforced and fabric-backed, by listed manufacturer.

B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC/TPA sheet membrane.

C. Subject to requirements, acceptable products include PVC Sheet: ASTM D 4434/D 4434M, Type III, fabric reinforced and fabric-backed, or KEE Sheet: ASTM D 6754/D 6754M, fabric reinforced and fabric-backed.

2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Plastic Foam Adhesives: 50 g/L.

b. Gypsum Board and Panel Adhesives: 50 g/L.

c. Multipurpose Construction Adhesives: 70 g/L.

d. Fiberglass Adhesives: 80 g/L.

e. Contact Adhesive: 80 g/L.

f. Other Adhesives: 250 g/L.

g. PVC Welding Compounds: 510 g/L.

h. Adhesive Primer for Plastic: 650 g/L

i. Single-Ply Roof Membrane Sealants: 450 g/L.

j. Nonmembrane Roof Sealants: 300 g/L.

k. Sealant Primers for Nonporous Substrates: 250 g/L.

l. Sealant Primers for Porous Substrates: 775 g/L.

3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." B. Membrane Bonding Adhesive:

1. Elastomeric low-VOC water-based contact-type adhesive for bonding TPA fleece-backed and TPO fleece-backed single ply membranes and flashings to substrates.

a. Basis of design product: Tremco, Fleece Back WB Single Ply Bonding Adhesive.

b. VOC, maximum, ASTM D 3960: 200 g/L.

C. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.

D. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch (25 mm wide by 1.3 mm) thick, pre-punched.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to membrane roofing system manufacturer.

2.6 SUBSTRATE BOARDS

A. Glass-mat-faced gypsum panel, primed, ASTM C 1177/C 1177M.

1. Basis of design product: Tremco/GP Gypsum Dens-Deck Prime.

2. Thickness: 1/4 inch.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

2.7 ROOF INSULATION MATERIALS

A. Glass-mat-faced gypsum panel, primed, ASTM C 1177/C 1177M.

1. Basis of design product: Tremco/GP Gypsum Dens-Deck Prime.

2. Thickness: 1/4 inch.

B. Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.

1. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.

2. Flame Spread Index, ASTM E 84: 10.

3. Smoke Developed Index, ASTM E 84: 30.

4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 0 g/L.

5. Tensile Strength, minimum, ASTM D 412: 250 psi (1724 kPa).

6. Peel Adhesion, minimum, ASTM D 903: 17 lbf/in (2.98 kN/m).

7. Flexibility, 70 deg. F (39 deg. C), ASTM D 816: Pass.

C. Polyisocyanurate board insulation, ASTM C 1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces. CCMC listed.

1. Basis of design product: Tremco, Trisotech.

2. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).

3. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.

D. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

E. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

F. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

G. Cant Strips: Cementous wood fiber cants"."

H. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.

2. Wood Roof Deck: Verify that wood deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

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

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal/100 sq. ft. (0.3 L/sq. m) and allow primer to dry.

E. Install acoustical roof deck rib insulation strips, specified in Division 05 Section "Steel Decking," according to acoustical roof deck manufacturer's written instructions, immediately before installation of overlying construction and to remain dry.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s recommendations.

B. Install roofing membrane, base flashings, and component materials in compliance with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system as listed in FMG’s “Approval Guide” for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49.

C. NRCA Installation Details: Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations; modify as required to comply with perimeter fastening requirements of FM Global references if applicable:

1. Base Flashing at Parapet Wall: Plates TP-1 and TP-1S.

2. Base Flashing and Counterflashing at Parapet Wall: Plates TP-5 and TP-5S.

3. Base Flashing and Counterflashing at Parapet Wall, Movement Joint: Plates TP-6 and TP-6S.

4. Base and Surface-mounted Counterflashing: Plates TP-4 and TP-4S.

5. Perimeter Edge, Raised: Plates TP-2 and TP-2S.

6. Perimeter Edge, Embedded Edge: Plates TP-3 and TP-3S.

7. Perimeter Edge, Draining: Plates TP-3A and TP-3AS.

8. Options for Perimeter Base Securement (Roof-to-Wall and Roof-to-Curb Intersections): Single Ply Table 7.1.

9. Options for Perimeter Base Securement (Roof-to-Wall and Roof-to-Curb Intersections: Single Ply Table 7.2.

10. Guide for Sheet Metal Fascia Edges for Thermoset and Thermoplastic Membrane: Single-Ply – Table 1.

11. Scupper, Raised: Plates TP-21 and TP-21S.

12. Gutter at Draining Edge: Plates TP-22 and TP-22S.

13. Expansion Joint, with metal cover: Plates TP-7 and TP-7S and Division 7 Section “Sheet Metal Flashing and Trim.”

14. Expansion Joint, with pre-manufacturer cover: Plates TP-7A and TP-7AS and Division 7 Section “Roof Expansion Assemblies.”

15. Curb Detail at Rooftop HVAC Units, Premanufactured: Plates TP-12 and TP-12S.

16. Curb Detail at Rooftop HVAC Units, Job-Built, Wood: Plates TP-13 and TP-13S.

17. Curb Detail at Skylight, Roof Hatch, and Smoke Vents: Plates TP-14 and TP-14S.

18. Penetration, Structural Member: Plates TP-15 and TP-15S.

19. Penetration, Sheet Metal Enclosure: Plates TP-16 and TP-16S.

20. Penetration, Stack Flashing: Plates TP-17 and TP-17S.

21. Penetration, Plumbing Vent: Plates TP-18 and TP-18S.

22. Penetration, Plumbing Vent, Premanufactured Boot: Plates TP-18A and TP-18AS.

23. Penetration, Pocket: Plates TP-19 and TP-19S.

24. Roof Drain: Plates TP-20 and TP-20S.

25. Guide for Clearances between Pipes / Walls / Curbs – Table 4.

26. Guide for Crickets and Saddles – Table 5.

27. Guide for Edge Scuppers with Tapered Saddles - Table 6.

3.4 SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Set substrate board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining substrate board in place according to approved shop drawings and membrane roofing system manufacturer's written instructions.

2. Set Dens-Deck to wood deck and mechanically fasten with Tremco/Olympic 1411 Fasteners and 2-inch metal plates. One fastener every two square feet.

3.5 VAPOR-RETARDER INSTALLATION

A. Laminated Kraft Paper Sheet: Install laminate-sheet vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively. Bond vapor retarder to substrate with adhesive applied at rate recommended by vapor-retarder manufacturer. Continuously seal side and end laps with tape.

3.6 INSULATION INSTALLATION

A. Install lightweight insulating concrete in accordance with requirements of Division 03 Section “Lightweight Insulating Concrete.”

B. Install tapered insulation under area of roofing to conform to slopes indicated.

C. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

3.7 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.

1. Install sheet according to ASTM D 5036.

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

C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Water-Based Bonding Adhesive: Apply to substrate at rate required by manufacturer. Install membrane immediately into adhesive, avoiding any air entrapment; do not allow adhesive to dry. Roll membrane into wet adhesive. Do not apply adhesive to splice area of membrane. Applied at a rate of an minimum of one gallon per square.

E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.

2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.

3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.8 MECHANICALLY FASTENED MEMBRANE ROOFING INSTALLATION

A. Start installation of membrane roofing in presence of roofing system manufacturer's technical personnel.

B. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Mechanically fasten or adhere membrane roofing securely at terminations, penetrations, and perimeter of roofing.

D. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.

2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.

3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

E. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.9 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation. E. Terminate and seal top of sheet flashings.

3.10 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 10 full-time days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining, construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

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

3.12 TILE ROOF SECTION REPAIR

A. Section includes the following for the Tile Roof Sections:
1. Remove all existing broken, damage, or cracked bell tile.
2. Notify Project Manager or Glendale Unified School District of any areas of underlayment that is deteriorated or damage after removal of tile.
3. Replace as above with PowerPly SA Smooth.
3. Remove all loose bell tile and re-secure.
4. Install new tile to match existing. Glendale Unified School District must approved tile prior to installation.
5. Tile installation shall match existing configuration.

3.13 ***OPTIONAL GUTTER REPLACMENT***

A. Remove and replace existing perimeter gutter from Building 1000 Roof Sections A & B

B. Replace with 24-gauge or better metal gutter to match existing in size, shape, and color.

C. Attach to existing downspouts, or replace if downspouts are damage.

3.14 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: _____

2. Address: _____

3. Building Name/Type: _____

4. Address: _____

5. Area of Work: _____

6. Acceptance Date: _____

7. Warranty Period: _____

8. Expiration Date: _____

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition. D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. lightning;

b. peak gust wind speed exceeding 74 mph (120 k/h);

c. fire;

d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;

e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

f. vapor condensation on bottom of roofing; and

g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor. E. IN WITNESS THEREOF, this instrument has been duly executed by:

1. Authorized Signature: _____

2. Name: _____

3. Date: _____

END OF SECTION 075419

SECTION 07500
ROOFING SPECIFICATIONS

PART I - GENERAL

1.01 RELATED DOCUMENTS

A. The attached are components of this section:
   1. General Conditions
   2. Supplemental Conditions
   3. Statement of roofing material manufacturer's qualifications
   4. Pre-final inspection checklist for Roofing Contractor

B. Contractor requirements prior to work proceeding and application.
   1. Contractor to determine if moisture is present in system.

1.02 SCOPE OF WORK

A. Furnish and install specified roofing and related components to Monte Vista Elementary School Buildings, 3,4,5, and 6, with Building 6000 Lunch Shelter as Optional, Plus new gutters installation as Optional, and Dunsmore Elementary School Buildings F and G. All Roof Section Elevations as follows:
   1. **BUILDING ROOF AREAS:**
      a. **Roof Reinforcement and Coating System** consist of the following work:
         1) Power wash all existing roof system, and flashing areas, as necessary.
         2) Sweep and remove all loose granules.
         3) Contractor shall take protective measures to protect conduits, units, roof equipment from overspray during application of roofing materials.
         4) Prime existing membrane prior to all field, wall, or flashing repairs with Water Based Asphalt Primer at a rate of one gallon per 100 square feet.
         5) Repair all roof membrane and flashing splits or tears with a five-course application of Solargard White Acrylic Sealer/Mastic and Permafab Membrane.
         6) Seal all Hypalon Seams with a three course of Solargard White Acrylic Mastic and Permafab Membrane.
         7) Seal the base of the Hypalon Flashing with a Two Course of Solargard Seam Sealer and Permafab or Burmesh Membrane
         8) Seal perimeter metal edge with Solargard Seam Sealer.
         9) Reinforce all center crowns of roof sections with a half and full Ply of Rapid Set Polyester reinforcement membrane set into specified Tremlastic Elastomeric Emulsion. Apply emulsion at a rate of 4½ to 5 gals. Per square.
         10) Seal metal counter flashing reglet with Tremseal Pro.
         11) Seal all pipe and metal penetrations with a 2-course of reinforcing membrane and Solargard White Acrylic Sealer/Mastic and Permafab Membrane.

12) Seal all field laps and seams with Solargard Seam Sealer and Permafab Membrane.
13) Replace all blocking as required.
14) Prime the roof surface with Tremprime WB Primer, at a rate of one gallon per 100 square feet.
15) Apply ICE White Roof Coating over all roof membrane and flashing areas, at a rate of Three and One Half0 (3½) gallons per 100 square feet. Application shall be applied in two separate coats of two gallons per square each.

2. OPTIONAL APPLICATIONS – TO BE BID SEPARATELY

a. Building 6000 Lunch Shelter:
   1) Complete all field repairs as outlined above.
   2) Remove Excess gravel from field.
   3) Three course the raised perimeter metal edge with Solargard Acrylic Mastic and Permafab Membrane.
   4) Clean the surface of the remaining gravel by washing or blowing clean.
   5) Prime the surface with Tremprime WB at ½ per square.
   6) Apply Rock-it Adhesive at 6 gallons per square, and embed Tremco White Rock at two to three hundred pounds per square.

b. Buildings 3000, 4000, and 5000
   1) Remove existing gutters.
   2) Replace gutters with minimum 22-gauge metal to match existing gutter in size, configuration, and attachment.

1.03 QUALITY CONTROL

A. Contractor shall:
   1. Be experienced in cold process coating and built-up roofing. 5 years' minimum.
   2. Be acceptable by the GLENDALE UNIFIED SCHOOL DISTRICT.
   3. Be a Manufacturer Certified or Approved Contractor.
   4. Has not been in Chapter 7 during the last ten (10) years.
   5. Provide list of at least 5 projects available for inspection employing same system within 100-mile radius of the GLENDALE UNIFIED SCHOOL DISTRICT.

B. Roofing material supplier shall:
   1. Be Associate Member in good standing with National Roofing Contractors' Association (NRCA) for at least five (5) years.
   2. Be nationally recognized in roofing, waterproofing, and moisture survey industry.
   3. Be approved by GLENDALE UNIFIED SCHOOL DISTRICT.
   4. Has not been in Chapter 11 during the last five (5) years.
   5. The GLENDALE UNIFIED SCHOOL DISTRICT is desirous of working with a financially strong organization, which has the ability to protect and insulate the GLENDALE UNIFIED SCHOOL DISTRICT from both product liability and warranty claims, relating to roofing that could be brought before the GLENDALE UNIFIED

SCHOOL DISTRICT during the course of the roofing warranty period. Financial strength of suppliers is a requirement of the GLENDALE UNIFIED SCHOOL DISTRICT proof of such must be shown. To this end, the following information is required by the GLENDALE UNIFIED SCHOOL DISTRICT:

a. The manufacturer must present to the GLENDALE UNIFIED SCHOOL DISTRICT a certificate of insurance for product liability with minimum limits of $25 million.
b. The manufacturer must have a current net worth in excess of $50 million and verify such by an affidavit from a corporate officer.

6. The GLENDALE UNIFIED SCHOOL DISTRICT is a supporter of responsible Health, Safety and Environmental issues and requires all manufacturers to have similar concerns, convictions and commitments. To this end, the primary manufacturers of materials used on GLENDALE UNIFIED SCHOOL DISTRICT roof must submit a formalized Corporate HS & E Policy and demonstrate active participation in such a policy.
7. The GLENDALE UNIFIED SCHOOL DISTRICT, to assure that the manufacturer can consistently deliver quality materials, requires the manufacturer to provide evidence of twenty (20) quarters of continuous plant inspections of roofing manufacturing sites over the past five (5) years by an independent Nationally Recognized Testing Laboratory (NRTL) as defined in 29 CFR Ch. XVII (7-1-93 Edition) from the Occupational Safety and Health Administration (OSHA).
8. Provide GLENDALE UNIFIED SCHOOL DISTRICT names of at least 5 qualified applicators.
9. Employ full-time Field Technical Services Representative available for final roof inspection.
10. Provide local Field Representative to make periodic site visits, report work quality and job progress.
11. Provide list of at least 10 projects available for inspection employing same roofing system within 25-mile radius of GLENDALE UNIFIED SCHOOL DISTRICT.
12. The presence and activity of the manufacturer's/specifier’s representative and/or GLENDALE UNIFIED SCHOOL DISTRICT's representative shall in no way relieve the contractor of contractual responsibilities or duties.
13. Roofing material manufacturer shall provide to the GLENDALE UNIFIED SCHOOL DISTRICT a Project Close-Out Book/Report upon delivery of the project warranty. This book/report shall include the following sections:
    a. Project Warranty
    b. Project Specifications
    c. Project Summary
    d. Job Progress Photos
    e. Project Inspection Reports
    d. Owner’s Manual describing maintenance and emergency repair.
    e. Inspection Report to be completed by the roofing material manufacturer two (2) years from the project completion.

C. Project meetings:
    1. Pre-Bid Conference:
        a. Will be held at place and time determined by GLENDALE UNIFIED SCHOOL DISTRICT.

b. Attendance:
   1) Roofing material supplier/specifier
   2) Contractor
   3) GLENDALE UNIFIED SCHOOL DISTRICT.
c. Agenda:
   1) Distribution of contract documents.
   2) Review of specification.
   3) Walkover inspection.

2. Pre-construction conference:
   a. Will be scheduled by GLENDALE UNIFIED SCHOOL DISTRICT within fifteen (15) days after notice of award.
   b. Attendance:
      1) Roofing material supplier/specifier
      2) Contractor
      3) Representative of GLENDALE UNIFIED SCHOOL DISTRICT.
   c. Agenda:
      1) Submittal of insurance certificates.
      2) Submittal of executed bonds.
      3) Payment terms.
      4) Execution of GLENDALE UNIFIED SCHOOL DISTRICT-Contractor Agreement.
      5) Distribution of contract documents.
      6) Submittal of list of subcontractors, material submittal, and progress schedule.
      7) Designation of responsible personnel.
      8) Walkover inspection.
3. Progress meetings:
   a. Will be scheduled by GLENDALE UNIFIED SCHOOL DISTRICT as required.
   b. Attendance:
      1) Roofing material manufacturer/specifier/ contractor.
      2) Job superintendent.
      3) Subcontractors, as appropriate.
      4) GLENDALE UNIFIED SCHOOL DISTRICT.
   c. Minimum agenda:
      1) Review of work progress.
      2) Field observations, problems, and decisions.
      3) Identification of problems which impede planned progress.
      4) Maintenance of progress schedule.
      5) Corrective measures to regain projected schedules.
      6) Planned progress during succeeding work period.
      7) Coordination of projected progress.
      8) Maintenance of quality and work standards.
      9) Effect of proposed changes on progress schedule and coordination.
      10) Other business relating to work.
4. Final inspection:
   a. Will be scheduled by roofing material manufacturer upon job completion.
   b. Attendance:

1) Contractor.
2) Roofing material manufacturer/specifier.
3) GLENDALE UNIFIED SCHOOL DISTRICT.

c. Minimum agenda:
1) Walkover inspection.
2) Identification of problems which may impede issuance of warranty.

D. Random sampling:
1. Roofing material:
a. During course of work, GLENDALE UNIFIED SCHOOL DISTRICT's Representative may secure samples according to ASTM D140-88 of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.
b. Should test results prove that a material is not functionally equal to specified material.
1) Contractor shall pay for all testing.
c. Roofing installed and found not to comply with the specifications shall be removed and replaced at no change in the contract price.

E. Regulatory requirements:
1. Uniform Building Code.
a. Replacement Roof - UL 790. - Class A.
b. Reinforcement Roof System – Will match existing UL Rating.
2. California Building Energy Efficiency Standards
a. Cool Roof Rating Council (CRRC) Title 24.

F. Plans and specifications:
1. Contractor must notify GLENDALE UNIFIED SCHOOL DISTRICT and specifier of any omissions, contradictions or conflicts seven (7) days before bid date. GLENDALE UNIFIED SCHOOL DISTRICT and specifier will provide necessary corrections or additions to plans and specifications by addendum. If contractor does not so notify GLENDALE UNIFIED SCHOOL DISTRICT and specifier of any such condition, it will be assumed that the contractor has included the necessary items in the bid to complete this specification.
2. It is the intent that this be a completed project as far as the contract documents set forth. It is not the intent that different phases of work on this project be delegated to various trades and subcontractors by the contract documents. Contractor must make own contracts with various subcontractors, setting forth the work these subcontractors will be held responsible for. Contractor alone will be held responsible by the GLENDALE UNIFIED SCHOOL DISTRICT for the completed project.
3. If the contractor feels a conflict exists between what is considered good roofing practice and these specifications contractor shall state in writing all objections prior to submitting quotations.
4. It is the contractor's responsibility during the course of the work, to bring to the attention of the GLENDALE UNIFIED SCHOOL DISTRICT's representative any defective membrane, insulation or deck discovered where not previously identified.

1.04 SUBMITTALS – NONE TREMCO MATERIALS

A. Submit at Pre-Construction Conference:
   1. Product compatibility:
      a. Written verification from roofing material supplier that major roofing components, including (but not limited to) coatings, cold process adhesives; roofing ply sheets; reinforcement fabric felts and mats; mastics; and sealants are all compatible with each other.
   2. Test reports:
      a. Written verification from roofing material supplier that roofing system meets or exceeds regulatory agency/s requirements.
   3. Red label products:
      a. Written verification from roofing material supplier that cold process coatings are not red label.
   4. Product data:
      a. Product data sheets.
      b. Material safety data sheets.
      c. Samples of coatings, adhesives, and roofing ply sheets.
      d. Samples of each material specified, properly labeled.
      e. List of 5 local projects where the specified roof system has been installed. Provide location, contact name, and telephone number.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery of materials:
   1. Deliver materials to job-site in new, dry, unopened, and well-marked containers showing product and manufacturer's name.
   2. Deliver materials in sufficient quantity to allow continuity of work.
   3. Coordinate delivery with GLENDALE UNIFIED SCHOOL DISTRICT.

B. Do not order project materials or start work before receiving GLENDALE UNIFIED SCHOOL DISTRICT's written approval.

C. Storage of materials:
   1. Store roll goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place materials on pallets. Do not stack pallets.
   2. Stack insulation on pallets.
   3. Store materials marked "keep from freezing" in areas where temperatures will remain above 40 F (5 C).
   4. For insulation, remove plastic packaging shrouds. For felt rolls, slit the top of the plastic shrink wrap only. Cover top and sides of all stored materials with tarpaulin (not polyethylene). Secure tarpaulin.
   5. Rooftop storage: Disperse material to avoid concentrated loading.
   6. No materials may be stored in open or in contact with ground or roof surface.

7. Should Contractor be required to quickly cover material temporarily, such as during an unanticipated rain shower, all materials shall be stored on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom.
8. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

D. Material handling:
1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.
3. Cold Process Trilaminate Ply Sheet: Do not remove packaging tubes until roll is ready for use.

1.06 SITE CONDITIONS

A. Field measurements and material quantities:
1. Applicator shall have SOLE responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

B. Existing conditions:
1. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt GLENDALE UNIFIED SCHOOL DISTRICT operations unless prior written approval is received from GLENDALE UNIFIED SCHOOL DISTRICT.
2. Access to roof shall be from exterior only.
3. Air-conditioning units and other equipment shall be moved as required to install roofing materials complete and in accordance with plans and specifications. When units and equipment are to be moved, they shall be carefully disconnected and removed to a protected area so as not to damage any part or component thereof, and shall be reconnected in such a way that they are restored to a prior work operating condition. Appropriate measures shall be taken to prevent dust, vapors, gases or odors from entering the building during roof removal, replacement or repair.
4. All disconnection and re-connection shall be performed by a mechanical and/or electrical company licensed to perform such work.

C. Safety requirements:
1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and GLENDALE UNIFIED SCHOOL DISTRICT fire and safety requirements.
3. Advise GLENDALE UNIFIED SCHOOL DISTRICT whenever work is expected to be hazardous to GLENDALE UNIFIED SCHOOL DISTRICT, employees, and/or operators.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.

5. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.

D. Waste Disposal:
1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

E. California Proposition 65:
1. Contractor will post all notices, make all communications and otherwise comply with California Proposition 65 requirements concerning notification of those who may be exposed to Prop 65 listed chemicals, as revised from time to time. Contractor will also comply with other requirements concerning the safe use and handling of roofing materials, including preventing vapors from entering buildings.

F. Environmental requirements:
1. Do not work in rain, or in presence of water.
2. Do not work in temperatures below 40 F (4.44 C).
3. Do not install materials marked "keep from freezing" when daily temperatures are scheduled to fall below 40 F (4.44 C).
4. Do not perform masonry work below 40 F (4.44 C).
5. Remove any work exposed to freezing.
6. Advise GLENDALE UNIFIED SCHOOL DISTRICT when volatile materials are to be used near air ventilation intakes so that they can be shut down or blocked as GLENDALE UNIFIED SCHOOL DISTRICT requires.

G. Security requirements:
1. Comply with GLENDALE UNIFIED SCHOOL DISTRICT security requirements.
2. Require identification be displayed by all persons employed on this project.

H. Temporary sanitary facilities:
1. Furnish, install, and maintain temporary sanitary facilities for employee use during project. Remove on project completion.
2. Place portable toilets in conformance with applicable laws, codes, and regulations.

1.07 SUBSTITUTIONS

A. When a particular make or trade name is specified, it shall be indicative of standard required. Bidders proposing substitutes shall submit the following 14 days prior to bid date to GLENDALE UNIFIED SCHOOL DISTRICT:
1. Written application with explanation of why it should be considered.
2. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified.

B. Only substitutes approved in writing by GLENDALE UNIFIED SCHOOL DISTRICT prior to scheduled bid date will be considered.

C. Notification of approvals will be mailed at least 7 days before bid opening.

D. GLENDALE UNIFIED SCHOOL DISTRICT reserves right to be final authority on acceptance or rejection of any substitute.

1.08 PAYMENT SECURITY

A. Any of the following:
   1. Payment & Performance Bonds: Contractor purchases Payment and Performance Bonds for benefit of Owner and material supplier. Bonding company/surety shall be rated B+ or better in current Key Rating Guide as issued by A. M. Best Co., Oldwick, NJ.

B. Progress payments:
   1. Contractor shall establish with Owner, Owner's procedure for payment and retainages prior to commencement of work on this project.
   2. Partial or progress payments shall not relieve Contract r of performance obligations under this contract, nor shall such payments be viewed as approval or acceptance of work performed.
   3. Final payment shall be withheld until all provisions of the specifications are met.

1.09 WARRANTY/GUARANTEE

A. Guarantee:
   1. Upon project completion and Owner acceptance, effective upon complete payment, Contractor shall issue Owner a guarantee against defective workmanship and materials for a period of three (3) years.

B. Warranty and Service Agreement:
   1. Upon project completion, Roofing Manufacturer, acceptance, and once complete payment has been received by both Contractor and Roofing Manufacturer, Roofing Manufacturer, shall deliver to Owner a Ten (10) Year Roofing Manufacturer Coating Warranty and Plus Service Agreement. Roofing Manufacturer, will, during the second and fifth year of this warranty service agreement, provide the following for the Roofing Manufacturer, Roof System:
      a. Warranty Coverage Includes:
         (1) The Roof Membrane
         (2) The Roof Flashing
         (3) Edge Components
         (4) Metal Components
      b. Inspection by a Roofing Manufacturer, Technical Service Representative and delivery of a written inspection report documenting roof conditions.
      c. Preventive maintenance and necessary repairs, including splits, tears, or breaks in the roof membrane system and flashings which threaten the integrity of the roof system and are not exempt due to neglect, negligence, vandalism, or some other exclusion.

d. General rooftop housekeeping and cleanup, subject to limits, but generally including removal of incidental debris.

C. Technical Service Inspection:

1. Roofing System Manufacturer to provide Technical Consulting Service for the installation of the Warranty System. Contractor to provide manufacturers Technical Service Inspectors are to review the installation procedures and materials. Contractor shall provide Ten (10) Days Technical Inspection days, at a cost of $ 800.00 per day to the contractor for Roof Restoration Project.

PART II - PRODUCTS

2.01 GENERAL

A. Comply with quality assurance provisions, references, specifications, and manufacturer's data. Where these may be in conflict the more stringent shall govern.

B. Products containing asbestos are prohibited on this project. Use only asbestos-free products.

C. Use products with personal protection. User must read container label and material safety data sheets prior to use.

D. All products shall bear UL, FM, and VOC criteria on labels.

2.02 BASIS OF DESIGN AND ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers shall meet or exceed all the requirements of these specifications.

B. Acceptable manufacturers shall meet or exceed material listed performance requirements.

C. Acceptable manufactures shall meet or exceed all specified warranties and maintenance requirements.

D. Manufacturer must submit current product data and Material Safety Data Sheets on all adhesives and mastics to ensure regulatory compliance.

E. Manufacturer must be in strict compliance with the system performance requirements and regulatory requirements as described in the specification. The GLENDALE Unified School District reserves the right to be final authority for acceptance or rejection of any substitutions.

F. Referenced Roofing materials from Tremlastic, Rapid Set Polyester, and TPA Single Ply system are listed to provide standard of required minimum quality.

2.03 ROOF DECKING

A. Concrete.

2.04 MECHANICAL FASTENERS AND ADHESIVES

A. Wood to wood:
   1. Galvanized, common, annular ring nail.
   2. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).

B. Wood to masonry:
   1. Anchor bolts, 1/2-inch (12.7 mm) diameter with 5/8-inch (15.9 mm) washer.

C. Wood to concrete:
   1. Deckfast #14 screw, by Construction Fasteners, Inc., Wyomissing, PA.
   2. Insul-Fixx #14, by Fabco RIF, Elyria, OH.
   3. Kwik-Deck screw, by Atlas Bolt & Screw, Ashland, OH.
   4. Olympic Fastener #14-10, by Olympic Manufacturing Group, Agawam, MA.
   5. Rawl Deck #14 Deck Screw, by The Rawlplug Co., Inc., New Rochelle, NY.
   6. Length: Sufficient to provide 1-1/2-inch (38 mm) embedment.

D. Galvanized sheet steel to wood blocking:
   1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.
   2. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.

E. Galvanized sheet steel to galvanized sheet metal. (Counterflashing extensions)
   1. Self-tapping sheet metal screws of 1/2-inch length and a minimum #3 diameter, with 5/8" steel/EPDM washer under head.

F. Termination bar to masonry/concrete:
   1. Lead masonry anchors.
   2. Length: Sufficient to provide 1-1/4 inches (32 mm) embedment minimum.

G. Drawband:
   1. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.
   2. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

H. Dens-Deck Prime to concrete deck:
   1. Water Based Primer.
   2. Solvent Free Insulation Adhesive.

2.05ROOFING MATERIALS

A. **Roof Membrane Reinforcement System for Flashing, Curbs, Drains, and Base.**
   1. Adhesives:
      a. Base Ply Adhesive:
         1) SBS Tremlastic Asphalt Elastomeric Emulsion.
      b. Interply adhesive:

1) Elastomeric emulsion.
c. Surfacing:
1) White high solids water based elastomeric coating with acrylic polymers.
2. Polyester Reinforcement Ply
a. Stitch Bonded Polyester – with Quick Cure Additive.
3. Roof Coating:
a. Energy Star & CRRC Listed, Title 24 Compliant, ICE Coating

B. **Roof Replacement System.**
1. Insulation:
a. Polyisocyanurate Insulation.
b. Temple Inland Fiberboard
2. Adhesives:
a. Interply adhesive:
1) Cold Asphalt LV Adhesive.
3. Roof Membrane:
a. 33lb. Glass Base Sheet
b. 28lb. Glass Base Sheet
c. FR Rated SBS Granulated Membrane
4. Membrane:
a. Rapid Set Polyester Sheet.
b. Permafab Membrane.
c. Burmesh Membrane.
5. Metal Edge:
a. Tri-Polymer Coated Metal.

C. Related roofing materials:
1. Elastomeric mastic:
a. Solargard White Acrylic Seal Sealer Mastic.
b. Solargard White Seam Sealer.
2. Asphalt primer - Water Based:
a. ASTM D 1644-88.
3. Flashing adhesive:
a. Asphalt Elastomeric Emulsion.
4. Flashing Sheet:
a. Polyester Reinforcing Membrane, quick setting
5. Flashing tape for pressure bar:
a. Butyl based sealant tape.
1) 1/8" X 1" X 50'.
6. Projection coating:
a. White high solids water based elastomeric coating with acrylic polymers.
7. Drawband and small joint sealant:
a. FS TT-S-00230C(2), single component, polyurethane sealant.
8. Hypalon flashing edge sealant:
a. ASTM C 719-86; single component, silicone sealant. Color: White.
9. Sealant Primer:

a. Sealant Manufacturer approved primer; all surfaces.

10. Metal Cleaner:
    a. Sealant Manufacturer approved cleaner.
11. Reinforcing mesh ply:
    a. Non-shrinking, non-rotting, woven glass mesh.
12. Walkway panels:
    a. 3 ft. x 5 ft. (915 mm x 1530 mm), granule surfaced, fiberglass reinforced panel.

2.06 METAL FLASHINGS

A. Termination bar:
   1. Galvanized steel bar:

B. Termination bar sealant:
   1. Metal primer: Sealant Manufacturer approved.
   2. FS TT-S-00230C(2), single component, polyurethane sealant.

C. Counterflashing and counterflashing extensions:
   1. Galvanized Steel: ASTM A 526-85, sheet steel with 1.25 oz./sq. (3.82 g/m^2) Galvwash ready to paint surfacing.
      a. Gage: Twenty-four (24).
      b. Solder: ASTM B32-89, alloy grade 50A. Neutralize flux after soldering.

2.07 SYSTEM PERFORMANCE REQUIREMENTS:

A. ASPHALT ELASTOMERIC EMULSION

Property	Typical Value	Test Method
Tensile strength	38psi (262 kPa)	ASTM D412-98a
Elongation @ 77 F min.	800%	ASTM D 412-98a
Density @ 77 F	8.4 lb./gal (0.98 kg/L)	ASTM D2939-98
Residue by evaporation	50%	ASTM D 2939-98
Asbestos content*	None	EPA/600/R-93/116
VOC*	50 g/L	ASTM D3960-93

* Volatile Organic Compound

B. NON-SHRINKING, NON-ROTTING WOVEN GLASS STRIPPING PLY MESH

Property	Typical Value	Test Method
Weight	0.065 kg/m^2 (1.32 lb/100 ft^2)	ASTM D 146-90
Moisture based on net weight	None	ASTM D 146-90
Average tensile strength @ (70 F)		
Wrap threads	289 N (65 lbf)	ASTM D 146-90
Filling threads	311 N (75 lbf)	ASTM D 146-90
Weight	18.7%	ASTM D 579-90
Type	PVC/acrylic	
Color	Aqua green	

C. RAPID SETTING POLYESTER REINFORCEMENT PLY

Property	Typical Value	Test Method
Weight	3.1 lb/100 ft^2 ($150g/m^2$)	ASTM D 3776-85 (1990)
Thickness	0.018 in. (0.46mm)	ASTM D1777-64 (1975)
Breaking force (grab) @77 F (25 C) (1" jaw)	72 lbf (320N)wrap	ASTM D-5034-90
Elongation @ 77 F (25 C) @ Max force	15% wrap 39% fill	ASTM D-5034-90

D. WATER BASED ASPHALT PRIMER (To existing roof, prior to elastomeric emulsion application)

Property	Typical Value	Test Method
Asbestos content	None	ASTM D276-87
Viscosity @ 25 C (77 F [Stormer Kreb]	50 KU	ASTM D562-81
Density @ 25 C (77 F)	1.05 kg/L (8.5 lb/gal)	ASTM D1475-85
Nonvolatile Content	32%	ASTM D1644-88
Flash point	Not Applicable	ASTM D3278-82
VOC*	65 g/L	ASTM D3960-89

* Volatile Organic Compound

E. WHITE REFLECTIVE SURFACEING

Property	Typical Value	Test Method
Density at 77 F (25 C)	6.4 lbs/gal ($767 kg/m^3$)	ASTM D 1475-90
Viscosity at 77 F (25 C)	11,800 cP (11.8 Pa s)	ASTM D 2196-86 (1991)
Non-volatile content	62% by weight	ASTM D 1644-88
Percent solids	70% by volume	ASTM D 5201-91
VOC	None	ASTM D 3960-89
Asbestos content	None	EPA 600/R-93/116

F. ONE-COMPONENT POLYURETHANE SEALANT

Property	Typical Value	Test Method
Hardness (Shore A)	40	ASTM C 920-02
Bond Durability	Pass	ASTM C 920-02
Stain & Color Change	none	ASTM C 920-02

Accelerated Weathering	Pass	ASTM C 920-02
VOC	85g/L	ASTM C 920-02
VOC	<4%	CARB Consumer Product Method 310

PART III - ROOF REINFORCEMENT AND REPLACEMENT AREAS - EXECUTION

3.01 EXAMINATION

A. Verify conditions as satisfactory to receive work.

B. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.

C. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by GLENDALE UNIFIED SCHOOL DISTRICT, manufacturer, and roofing contractor.

D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

3.02 GENERAL WORKMANSHIP

A. Substrate: Free of foreign particles prior to laying roof membrane.

B. Phased application: Not permitted. All plies shall be completed each day.

C. Traffic and equipment: Kept off completed plies until adhesive has set.

D. Wrapper and packaging materials: Not to be included in roofing system.

E. Entrapped aggregate: Not permitted within new membrane. Its discovery is sufficient cause for rejection.

F. Ply shall never touch ply, even at roof edges, laps, tapered edge strips, and cants.

G. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.

H. Seal all exterior walls, to the scupper drain joints with two-part polyurethane sealant.

I. Fit plies into roof drain rims; install flashing and finishing plies; secure clamping collars; install domes.

3.03 PREPARATION

A. Protection:
   1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to GLENDALE UNIFIED SCHOOL DISTRICT.
   2. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by GLENDALE UNIFIED SCHOOL DISTRICT.
   3. Roofing, membrane repairs, shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
   4. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
   6. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
   7. Protect building surfaces at chute/set-up areas with tarpaulin. Secure tarpaulin. Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster/chute shall be removed from premises. Spilled or scattered debris shall be cleaned-up immediately. Removed material to be disposed from roof as it accumulates.
   8. At end of each working day, removal areas shall be sealed with water stops along edges to prevent water entry.
   9. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.04 **ROOF PREPARATION**

A. Preparation:
   1. Clean the complete roof system of loose granules and debris.
   2. Wash the surface the roof system if necessary for installation of the restoration/coating system.
   3. Prime all areas of repair with Water Based Asphalt Primer.

B. Roof membrane and flashing preparation:
   1. Sweep clean roof membrane and all flashing and areas.
   2. Prime the entire area which is to be repaired (6” wide, minimum) with an application of water based asphalt primer, applied at rate of one (1) gallon per 100 square feet.
   3. Reinforce and seal any splits, un-adhered flashings, with a three-course application of White Acrylic Mastic embedded into reinforcing (6”) mesh, sealed over with mastic.
      a. Application of the mastic will be at rate of (½) pound per 100 square feet, per application course.
   4. Blisters and ridges:

a. Cut away delaminated felts until firmly laminated felts exist along every area to be repaired.
b. Remove debris, and dust from area extending at least (8 inches) beyond perimeter of depressed area. Square the corners.
c. Fill depression with alternating layers of asphalt mastic and asphalt ply sheet; match number of plies removed.
d. Cover layers of mastic/felt with two (2) layers of reinforcing mesh (6 inch) wide strips and one layer of (12 inch) wide strips embedded between trowel applications of asphalt mastic.
e. Extend repair area at least (6 inches) beyond filled depression. Overlap reinforcing mesh at least (2 inches). Cover mesh completely with mastic.

5. Install a 1-ply Tremlastic and Rapid Set reinforcing system to all drains, curbs, base, and perimeter flashing.

C. **ROOF REINFORCEMENT SYSTEM TO:** all roof membrane curbs, vents slopes, and flashings areas.
1. Apply water based asphalt primer at rate of 100 sq. ft. per gallon.
2. Roof membrane and flashings reinforcement system application:
a. Prior to application of the reinforcement system, the contractor will inspect the entire roof with the Roofing Manufacture's Representative for substrate approval.
b. Apply Elastomeric Emulsion to all base, curb, slopes, and wall flashing areas.
c. Roll or apply the membrane plies in shingle fashion into a single coating of elastomeric emulsion applied at a rate of four and one half (4½) gallons per one hundred (100) square feet and between each ply.
d. All plies will be dry broom or brush the membrane to eliminate all blisters and not allow any dry mesh in the new reinforcement membrane system.
h. All fishmouth and membrane deformities in the new membrane will be removed and repaired with equal plies of the polyester membrane and elastomeric emulsion. (To be installed as specified above.)

D. Surfacing:
1. Allow the reinforcement system to cure for twenty (24) hours.
2. Clean the entire roof membrane, flashings and parapet wall areas of all dirt and debris.
3. Prime the entire roof membrane, flashings and parapet wall areas with Water Based Primer to complete roof at 100 square feet per gallon. All areas primed must be allowed to dry and must have the white reflective coating applied the same day. Primed areas left over night to dry, must be re-primed the next day.
4. Over the entire primed area apply a base coat of white reflective roof coating at a rate of two (2) gallons per 100 square feet per coat. Two Coats Required. Allow to dry.
5. Over **all roof membrane and flashing areas** apply a final coat of white reflective roof coating at a rate of one and one half (1½) gallon per 100 square feet. Application shall be completed in two coats.
6. A total of 4 gallons per square is required

3.05 ADJUSTING AND CLEANING

A. Repair of deficiencies:
   1. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.

B. Clean-up:
   1. Immediately upon job completion, roof membrane and grounds shall be cleaned of project debris.

END OF DETAILED SPECIFICATIONS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Owner-furnished products.
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.
8. Miscellaneous provisions.

1.3 PROJECT INFORMATION

A. Facility Owner Information:

1. Owner Name: Glendale Unified School District - CA.
2. Owner's Representative: .

B. Facility Information:

1. Facility Name: R.D. White Elementary School.
2. Building Name: Building 1000, Roof Sections B, C, and D.
3. Building Location: 744 East Doran Street, Glendale, CA 91204.

C. Project Information:

1. Project Name: POWERPLY POWERFAST SYSTEM.

2. Project Number: <Insert Owner's Project Number if required>.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Roof Area RA#1: Building 1000 - Roof Sections B, C, and D:

a. Remove existing roof systems down to the wood deck.

b. Remove existing metal coping and all membrane flashing.

c. Area of Roof: 26,000 sq. ft.

d. Description of Work: New roofing installation.

e. Install new wood nailer to perimeter walls and new 24 gauge or better metal coping.

f. Install new TPA Flashing to all perimeter walls.

g. Refer to new roofing installation specified in Section 070150.72 "Rehabilitation of Built-Up Asphalt Roofing".

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

A. Use of Site, Limited: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

1. Use of Site: Limit use of Project site to work in areas indicated and as directed by Owner. Do not disturb portions of Project site beyond areas in which the Work is indicated, including designated lay-down areas.

2. Driveways, Walkways and Entrances: Keep driveways, facility loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.

b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Owner will occupy site including existing and adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.

2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.

2. Obtain Owner's written permission before proceeding with disruptive operations.

C. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

D. Nonsmoking Project: Use of tobacco products on the Project site is not permitted.

E. Controlled Substances: Use of other controlled substances on the Project site is not permitted.

F. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 075216.15 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING, COLD-APPLIED

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Section Includes: Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing system on wood deck, including:

a. Substrate board.

b. Mechanically-attached base sheet.

c. Mineral granulated cap sheet.

d. Base flashing sheets.

e. Roof surfacing consisting of surfacer and granular aggregate surfacing.

B. SCOPE OF WORK: Section Includes:

1. Tear-off and properly dispose of existing roof systems, roofing accessories, metal flashings, obsolete equipment, roof flashing, and identified equipment on the identified section.

2. Installation of Mechanically Fasten PowerFast Styrene-butadiene-styrene (SBS) modified bituminous membrane roofing system including but not limited to:

3. Tapered insulation as required behind curbs.

4. Mechanically fasten one quarter (¼”) Inch Dens-Deck Board to wood deck with six fasteners and plates per board.

5. Install one ply of PowerPly HE Smooth Modified Bitumen Ply Sheet to wood deck with Tremco # 15 Fasteners and Tremco 2 Inch Barbed Plates, along the side and end laps, 16 inches on center.

6. The side laps shall be four (4”) inches, and the end laps shall be Six (6”) Inches.

7. Seal the side and end laps with Tremco LF Adhesive, a two-component cartridge adhesive. Ensure all end and side laps are fully adhered and watertight.

8. Install new perimeter 24-gauge metal edge. Strip in the metal edge with two plies of 28 lb. glass membrane set into PowerPly Standard LV Adhesive.

9. Install Tremco PowerPly Standard FR GT W-24 Modified Bitumen White Granulated Capsheet, to base layer with PowerPly Standard LV Adhesive, at a rate on not less than Two and one half (2½) gallons per square.

10. Seal the side and end laps with Tremco LF Adhesive, a two-component cartridge adhesive. Ensure all end and side laps are fully adhered and watertight.

11. Apply/embed # 11 White Granules to areas of excessive adhesive. Dirty membranes will require application of two gallons of ICE Coating.

12. Install new TPA Flashing Membrane around all drains.

13. Remove existing metal counter flashing from perimeter walls.

14. Install new TPA Flashing to all perimeter walls (Note: the TPA Flashing shall turn down the outside one inch pass the wood nailer), base, curb, or penetration flashing. Seal the TPA Flashing with Rock-it Adhesive and Burmesh Membrane Five Course, top dress the Rock-it Adhesive with White Granules.

15. Install new wood nailers to perimeter parapet walls and 24 gauge or better metal coping.

16. On area C, at tile roof section, metal coping shall be installed under the bottom roll of tile.

17. Remove and replace roof vents.

18. Remove metal expansion joint on Roof Section C and D, and replace with TPA Flashing and new sheet metal.

19. Install new TPA Scuppers as required.

20. Install Termination Bars in the middle of all walls greater than 18 inches in height, with TF-Tape and Anchors.

21. Install new 22 – gauge or better sheet metal drain boxes to Roof Section D.

B. Related Sections:

1. Division 06 carpentry section for wood nailers, wood cants, curbs, and blocking.

2. Division 07 Section "Preparation for Re-Roofing" for recover board beneath new membrane roofing.

3. Division 07 Section "Sheet Metal Flashing and Trim" for custom metal roof penetration flashings, flashings, and counterflashings.

4. Division 07 Section "Roof Specialties" for manufactured copings, roof edge flashings, roof edge drainage systems, counterflashings, and reglets.

C. Unit Prices: Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

1.3 DEFINITIONS

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

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastened components.

1. Base flashings and built-up terminations.

a. Indicate details meet requirements of NRCA and FMG required by this Section.

2. Crickets, saddles, and tapered edge strips, including slopes.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers? names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.

1. Include letter from Manufacturer written for this Project indicating approval of Installer.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements, including UL listing certificate.

2. Indicate that proposed system components are compatible.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

E. Warranties: Unexecuted sample copies of special warranties.

F. Field Quality Control Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

B. Warranties: Executed copies of warranties.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer with UL listed roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

1. Approval of Other Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.

b. Samples of each component.

c. Sample submittal from similar project.

d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.

e. Sample warranty.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

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

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

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

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer's Warranty: Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.

2. Warranty Period: 20 years from date of Substantial Completion.

C. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Three years from date of Substantial Completion.

D. Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:

1. Sheet metal flashing and trim, including roof penetration flashings.

2. Manufactured copings, roof edge, counterflashings, and reglet.

3. Roof curbs, hatches, and penetration flashings.

4. Roof and parapet expansion joint assemblies.

5. Metal roof, wall, and soffit panels and trim.

E. Technical Service Inspection:

1. Roofing System Manufacturer to provide Technical Consulting Service for the installation of the Warranty System. Contractor to provide manufacturers Technical Service Inspectors are to review the installation procedures and materials. Contractor shall provide Eight (8) Days Technical Inspection days, at a cost of $ 800.00 per day to the contractor for Roof Restoration Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer/Product: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com, that are named in other Part 2 articles.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. FM Global Standards: Roofing, base flashings, and component materials shall be identical to materials that comply with requirements in FM Global 4470 as part of a roofing system listed or approved by FM Global for Class 1 or non-combustible construction, as applicable. Identify applicable materials with FM Global markings. Comply with Fire/Windstorm Classification and Hail Resistance Rating below.

1. Fire/Windstorm Classification: Class 1A-90.

2. Hail Resistance Rating: MH.

D. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:

1. FM Global 1-49: Loss Prevention Data Sheet for Perimeter Flashings.

2. FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.

3. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.

4. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

E. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

F. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

2.3 ROOFING MEMBRANE MATERIALS

A. Base Sheet:

1. ASTM D 6164 Type I Grade S SBS modified asphalt-coated polyester reinforced high-elongation sheet, dusted with fine mineral surfacing on both sides.

a. Basis of design product: Tremco, PowerPly HE Smooth.

b. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 5147: Machine direction, 165 lbf/in (28 kN/m); Cross machine direction, 140 lbf/in (24 kN/m).

c. Tear Strength, ASTM D 5147: Machine direction, 160 lbf 700 N); Cross machine direction 130 lbf (570 N).

d. Elongation at 0 deg. F (-18 deg. C), minimum, ASTM D 5147: 50 percent.

e. Low Temperature Flexibility, minimum, ASTM D 5147: -25 deg. F (-32 deg. C).

f. Thickness, ASTM D 5147: 0.094 in (2.4 mm).

B. SBS Modified Bituminous Membrane Sheets:

1. Click here to select SBS membrane sheets.

C. SBS Modified Bituminous Cap Sheet:

1. ASTM D 6163 Type I Grade G SBS-modified asphalt-coated glass-fiber-reinforced sheet, granular surfaced with a factory applied white reflective granule; CRRC listed and California Title 24 Energy Code compliant.

a. Basis of design product: Tremco, PowerPly Standard FR GT24W.

b. Exterior Fire-Test Exposure, ASTM E 108: Class A.

c. Tensile Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 70 lbf/in (12.0 kN/m); Cross machine direction 50 lbf/in (8.8 kN/m).

d. Tear Strength at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction, 90 lbf (400 N); Cross machine direction 90 lbf (400 N).

e. Elongation at 73 deg. F (23 deg. C), minimum, ASTM D 5147: Machine direction 4 percent; Cross machine direction 4 percent.

f. Low Temperature Flex, maximum, ASTM D 5147: -10 deg. F (-23 deg. C).

g. Thickness, minimum, ASTM D 5147: 0.157 inch (4 mm).

h. Solar Reflectance Index (SRI), ASTM E 1980: 88.

D. Base Flashing Sheet:

1. Thermoplastic PVC/TPA sheet, ASTM D 4434 Type IV internally fabric reinforced, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant.

a. Basis of design product: Tremco, TPA Roof Membrane.

b. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).

c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (440 N).

d. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: 25 percent.

e. Minimum Thickness, nominal, ASTM D 751: 45 mils (1.1 mm).

f. Exposed Face Color: White.

g. Reflectance, ASTM C 1549: 86 percent.

h. Thermal Emittance, ASTM C 1371: 0.86.

i. Solar Reflectance Index (SRI), ASTM E 1980: 108.

j. Recycled Content, minimum: 25 percent pre-consumer.

k. Acceptable Alternate Products: C. Subject to requirements, acceptable products include PVC Sheet: ASTM D 4434/D 4434M, Type IV, fabric reinforced and fabric-backed, or KEE Sheet: ASTM D 6754/D 6754M, fabric reinforced, by listed manufacturer..

E. Glass-Fiber Fabric:

1. Woven Glass Fiber Mesh, Vinyl-Coated: Tremco, Burmesh.

a. Basis of design product: Tremco, Burmesh.

2.4 COLD-APPLIED ADHESIVE MATERIALS

A. General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Flashing Backer Sheet Adhesive:

1. Cold-applied roofing adhesive and surfaces, one-part, formulated for compatibility and use with specified roofing membranes and flashings.

a. Basis of design product: Tremco, PowerPly Standard Cold Adhesive.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

c. Nonvolatile Content, minimum, ASTM D 6511: 72 percent.

d. Flash Point, minimum, ASTM D 93: 100 deg F (38 deg C).

C. Flashing Sheet Adhesive:

1. Cold-applied roofing adhesive and surfaces, one-part, formulated for compatibility and use with specified roofing membranes and flashings.

a. Basis of design product: Tremco, PowerPly Standard Cold Adhesive.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

c. Nonvolatile Content, minimum, ASTM D 6511: 72 percent.

d. Flash Point, minimum, ASTM D 93: 100 deg F (38 deg C).

2. Cold-applied roofing surfacing adhesive, one-poart white solar reflective low-volatile polymeric, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant when combined with approved white gravel.

a. Basis of design product: Tremco, Rock-It Adhesive.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

c. Nonvolatile Matter, minimum ASTM D 6511: 65 percent.

d. Reflectance (adhesive plus aggregate), ASTM C 1549: 70 percent.

e. Thermal emittance (adhesive plus approved aggregate), ASTM C 1371: 0.90.

D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, non-skinning, and nondrying.

2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

C. Base Sheet Mechanical Fasteners: Manufacturer's standard 2-inch wide barbed galvanized steel seam plate.

D. Stripping Reinforcing Fabric:

1. Woven Glass Fiber Mesh, Vinyl-Coated: Tremco, Burmesh.

a. Basis of design product: Tremco, Burmesh.

E. Joint Sealant: Elastomeric joint sealant compatible with roofing materials, with movement capability appropriate for application.

1. Click here to select joint sealant.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

G. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.6 SUBSTRATE BOARDS

A. Substrate / Thermal Protection Board:

1. Glass-mat-faced gypsum panel, ASTM C 1177/C 1177M.

a. Basis of design product: Tremco/GP Gypsum DensDeck.

b. Thickness: 1/4 inch.

2.7 SURFACING MATERIALS

A. Cold-Applied Adhesive Surfaces:

1. Cold-applied roofing surfacing adhesive, one-part white solar reflective low-volatile polymeric, Energy Star qualified, CRRC listed, and California Title 24 Energy Code compliant when combined with approved white gravel.

a. Basis of design product: Tremco, Rock-It Adhesive.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

c. Nonvolatile Matter, minimum ASTM D 6511: 65 percent.

d. Reflectance (adhesive plus aggregate), ASTM C 1549: 70 percent.

e. Thermal emittance (adhesive plus approved aggregate), ASTM C 1371: 0.90.

2. Cold-applied roofing adhesive and surfaces, one-part, formulated for compatibility and use with specified roofing membranes and flashings.

a. Basis of design product: Tremco, PowerPLy Standard Cold Adhesive.

b. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.

c. Nonvolatile Content, minimum, ASTM D 6511: 72 percent.

d. Flash Point, minimum, ASTM D 93: 100 deg F (38 deg C).

2.8 WALKWAYS

A. Walkway Material:

1. Walkway pads, ceramic-granule-surfaced reinforced asphaltic composition slip-resisting pads, manufactured as a traffic pad for foot traffic, 1/2 inch (13 mm) thick minimum.

a. Basis of design product: Tremco, Trem-Tred.

b. Flexural Strength at max. load, minimum, ASTM C 203: 210 psi (1.5 kPa).

c. Granule adhesion (weight loss), maximum, ASTM D 4977: 1.1 gram.

d. Impact Resistance at 77 deg. F (25 deg. C), ASTM D 3746: No Damage to Roof.

e. Pad Size: 36 by 48 inch (914 by 1220 mm).

2. Roof Pavers: Refer to Section 077623 "Roof Pavers."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.

2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Wood Roof Deck: Verify that wood deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

4. Verify that existing insulation and substrate is sound and dry.

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

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer's recommendations.

B. Install wood cants, blocking, curbs, and nailers in accordance with requirements of Division 06 rough carpentry section.

C. Install roofing membrane, base flashings, and component materials in compliance with requirements in FMG 4470 as part of a membrane roofing system as listed in FMG's "Approval Guide" for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49, including requirements for wood nailers and cants.

D. Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations; modify as required to comply with requirements of FMG references above:

1. Metal Parapet Cap (Coping) and Base Flashing: Plates MB-1 and MB-1S.

2. Surface-Mounted Counterflashing for Concrete Walls (at Parapet Wall): Plates MB-4 and MB-4S.

3. Base Flashing for Wall-supported Deck: Plates MB-5 and MB-5S.

4. Base Flashing for Non-wall-supported deck (Movement Joint): Plates MB-6 and MB-6S.

5. Base and Surface-mounted Counterflashing: Plates MB-4 and MB-4S.

6. Base Flashing for Vented Base Sheet: Plates MB-5A and MB-5AS.

7. Raised Perimeter Edge with Metal Flashing (Fascia Cap): Plates MB-2 and MB-2S.

8. Embedded Edge Metal Flashing Edge (Gravel-stop): Plates MB-3 and MB-3S.

9. Scupper Through Raised Perimeter Edge: Plates MB-21 and MB-21S.

10. Gutter at Draining Edge: Plates MB-22 and MB-22S.

11. Expansion Joint with Metal Cover: Plates MB-7 and MB-7S and Division 07 Section "Sheet Metal Flashing and Trim."

12. Expansion Joint with Premanufactured Cover: Plates MB-7A and MB-7AS and Division 07 Section "Roof Expansion Assemblies."

13. Area Divider in Roof System: Plates MB-8 and MB-8S.

14. Equipment Support Curb: Plates MB-9 and MB-9S.

15. Equipment Support Stand: Plates MB-10.

16. Equipment Support Stand and Typical Rain Collar Penetration Detail: Plates MB-11 and MB-11S.

17. Raised Curb Detail at Rooftop HVAC Units, Premanufactured: Plates MB-12 and MB-12S and Division 7 Section "Roof Accessories."

18. Raised Curb Detail at Rooftop HVAC Units (Job site constructed wood curb): Plates MB-13 and MB-13S and Division 06 Section "Miscellaneous Rough Carpentry."

19. Skylight, Scuttle (Roof Hatch), and Smoke Vents: Plates MB-14 and MB-14S and Division 07 Section "Roof Accessories."

20. Penetration, Structural Member through Roof Deck: Plates MB-15 and MB-15S.

21. Penetration, Sheet Metal Enclosure for Piping Through Roof Deck: Plates MB-16 and MB-16S

22. Penetration, Isolated Stack Flashing: Plates MB-17 and MB-17S.

23. Penetration, Isolated Stack Flashing: Plates MB-17A and MB-17AS.

24. Penetration, Plumbing Vent: Plates MB-18 and MB-18S.

25. Penetration, Pocket: Plates MB-19 and MB-19S.

26. Roof Drain: Plates MB-20 and MB-20S.

27. Roof Drain: Plates MB-20A and MB-20AS.

28. Guide for Clearances between Pipes / Walls / Curbs - Table 4

29. Guide for Crickets and Saddles - Table 5

30. Guide for Edge Scuppers with Tapered Saddles - Table 6

3.4 SUBSTRATE BOARD INSTALLATION

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

3.5 COLD-APPLIED ROOFING MEMBRANE INSTALLATION, GENERAL

A. Deck Type: Wood deck.

B. Base Sheet: One.

1. Adhering Method: Mechanically fastened.

C. Number of Smooth-Surfaced SBS-Modified Asphalt Sheets: One.

1. Adhering Method: Cold-adhesive applied.

D. Granular-Surfaced SBS-Modified Asphalt Cap Sheet:

1. Adhering Method: Cold-adhesive applied.

E. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

F. Cooperate with testing agencies engaged or required to perform services for installing roofing system.

G. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new and existing roofing.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.

4. Remove and discard temporary seals before beginning work on adjoining roofing.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane sheets according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

2. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Plan layout to stagger lap seams and end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.

3. Commence layout at low point of roof area.

4. Repair tears and voids in laps and lapped seams not completely sealed.

B. Mechanically-Fastened Base Sheet:

1. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches and 6 inches (51 mm and 150 mm), respectively.

2. Install lapped base-sheet course, extending sheet over and terminating beyond cants.

3. Starting at one end of sheet, install mechanical fasteners along center of 4 inch (102 mm) side lap spaced as indicated on approved shop drawings. Install fasteners to set the seam

plate tight to the membrane. Do not overdrive fastener. Do not ripple or wrinkle the membrane.

4. Lap Seam Treatment: Adhere side and end lap seams with base sheet overlap adhesive and roll using weighted roller in accordance with manufacturer's instructions.

5. Lap Seam Treatment: Heat weld side and end lap seams in accordance with manufacturer's instructions.

C. Granular Surfaced Cap Sheet:

1. Fully embed sheet in cold-applied membrane adhesive applied at rate required by roofing manufacturer. Roll sheet using weighted roller. Ensure complete and continuous seal and contact between adhesive and membrane without wrinkles, fishmouths, and blisters.

2. Lap Seam Treatment: Adhere side and end lap seams with base sheet overlap adhesive and roll using weighted roller in accordance with manufacturer's instructions.

3. Lap Seam Treatment: Heat weld side and end lap seams in accordance with manufacturer's instructions.

3.7 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Extend base flashing up walls or parapets a minimum of 12 inches (300 mm) above built-up roofing and 6 inches (150 mm) onto field of built-up roofing.

2. Prime substrates with asphalt primer if required by roofing system manufacturer.

3. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive. Apply cold-applied flashing sheet adhesive to back of flashing sheet if recommended by roofing manufacturer. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

B. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

C. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

D. Roof Drains: Set 30 by 30 inch (760 by 760 mm) square metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 6 inch (150 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

3.8 SURFACING AND COATING INSTALLATION

A. Cold-Applied Adhesive/Surfaces: Coat roofing membrane surface with cold-applied adhesive surfacing adhesive applied at rate required by roofing manufacturer.

3.9 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.

1. Sweep away loose aggregate surfacing.

2. Set walkway pads in cold-applied adhesive.

B. Walkway Cap Sheet Strips: Install cap sheet strips, approximately 36 inches (900 mm) wide and in lengths not exceeding 10 feet (3 m), leaving a space of 6 inches (150 mm) between strips. Install roofing membrane walkway cap sheet strips over roofing membrane in cold-applied adhesive.

C. Roof-Paver Walkways: Install walkway roof pavers in accordance with requirements of Section 077623 "Roof Pavers."

3.10 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 6 full-time days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at commencement and upon completion.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.11 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining, construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

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

3.12 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:

2. Address:

3. Building Name/Type:

4. Address:

5. Area of Work:

6. Acceptance Date:

7. Warranty Period:

8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. lightning;

b. peak gust wind speed exceeding 74 mph (120 k/hr);

c. fire;

d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;

e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

f. vapor condensation on bottom of roofing; and

g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed by:

1. Authorized Signature:

2. Name:

3. Date:

END OF SECTION 075216.15

TREMCO

5381 Via Pisa, Thousand Oaks, Ca. 91320

William R. Calagna
Certified Technical
Roof Consultant

805-499-5663 Office
805-499-5996 Fax
818-429-2584 Cell
800-282-4343 Division Office
BCALAGNA@AOL.COM Email

September 6, 2017

Glendale Unified School District
333 W Magnolia Ave.
Glendale, California 91204

Attention: Mr. Kent Smith
Director of Facilities
Mr. Raymond Mikaily

Subject: Asbestos Core Testing Proposal
Keppel Elementary School (2 Cores)
R. D. White Elementary School (3 Cores)

Gentlemen:

This proposal is for removal of roof cores at the above locations, repairing the core cuts, and the testing of the cores for Asbestos.

This needs to be completed prior to bidding this falls projects.

Cost for Asbestos Testing of Five (5) Cores is $ 1,150.00

I will submit the cores for testing once I receive a PO or Verbal Approval.

If you have any questions, please do not hesitate to call me.

Sincerely,

Bill Calagna
Tremco Inc.

Core Locations:

GLENDALE UNIFIED SCHOOL DISTRICT
KEPPEL ELEMENTARY SCHOOL BUILDING 1000
730 GLENWOOD ROAD
GLENDALE, CA.
ROOF SECTION A

GLENDALE UNIFIED SCHOOL DISTRICT
KEPPEL ELEMENTARY SCHOOL BUILDING 1000
730 GLENWOOD ROAD
GLENDALE, CA
ROOF SECTION B

GLENDALE UNIFIED SCHOOL DISTRICT
R D WHITE ELEMENTARY SCHOOL BUILDING 1000
744 EAST DORAN STREET
GLENDALE CA. 91204
ROOF SECTION B

GLENDALE UNIFIED SCHOOL DISTRICT
R D WHITE ELEMENTARY SCHOOL BUILDING 1000
744 EAST DORAN STREET
GLENDALE CA. 91204
ROOF SECTION C

GLENDALE UNIFIED SCHOOL DISTRICT
R D WHITE ELEMENTARY SCHOOL BUILDING 1000
744 EAST DORAN STREET
GLENDALE CA. 91204
ROOF SECTION D

ENCORP ENVIRONMENTAL MANAGEMENT AND SERVICES
16700 VALLEY VIEW AVE. STE. 100 LA MIRADA, CALIFORNIA 90638
(714) 523-9811 · FAX (714) 523-9810 · MAIN@ENCORP.NET · WWW.ENCORP.NET

Client Name: Glendale USD
Client Address: 333 West Magnolia Avenue
Glendale, CA 91204
Facility Name: KEPPLY ES-BLDG 1000
Facility Address:

Reference Batch Number: 055873
Sampled Date:
Sampled By:
Analyzed By: RONNIE KENESON

Project Number: CL18086 . G01
Date Received: 2/8/2018
Date Analyzed: 2/8/2018

LABORATORY TEST REPORT

BULK ASBESTOS FIBER ANALYSIS (PLM) EPA-600/R-93/116: Interim Method for the Determination of Asbestos In Bulk Insulation Samples

Sample Number	Field/ Client Number	SAMPLE DESCRIPTION			Friable or Non- Friable	CVE Asbestos Type(%)	Non Asbestos (%)
		Sample Location/Activity	Color	Material			
742136A	1A	ROOF SECTION A	BLACK/SILVER	ROOF CORE-SHINGLE	FR	NONE DETECTED	4% FIBROUS GLASS 96% MATRIX
742136B	1B	ROOF SECTION A	BLACK	ROOF CORE-TAR	FR	NONE DETECTED	100% MATRIX
742136C	1C	ROOF SECTION A	BLACK	ROOF CORE-FELT	FR	NONE DETECTED	20% CELLULOSE 80% MATRIX
742137A	2A	ROOF SECTION B	BLACK/SILVER	ROOF CORE-SHINGLE	FR	NONE DETECTED	4% FIBROUS GLASS 96% MATRIX
742137B	2B	ROOF SECTION B	BLACK	ROOF CORE-TAR	FR	NONE DETECTED	100% MATRIX
742137C	2C	ROOF SECTION B	BLACK	ROOF CORE-FELT	FR	NONE DETECTED	20% CELLULOSE 80% MATRIX

Notes:

APPROVED SIGNATURE: _____
Ronnie Keneson , Lab Manager

-NOTES: ND=None Detected Asbestos is not quantifiable below the method detection limit of one (1) percent. Amphibole asbestos includes amosite, crocidolite, anthophyllite, tremolite and actinolite. (FR) = Friable, (NF) = Non-Friable. Condition of sample is as received by the laboratory. Our policy is to retain all samples for a period of thirty days. Accredited by the National Voluntary Laboratory Accreditation Program and Environmental Laboratory Certification for the specific scope of accreditation under NVLAP Lab Code 200878-0 and ELAP certificate no. 2379. Results reported pertain to sample(s) as submitted and does not necessarily apply to other apparently identical or similar materials.

 Where applicable, layers or "sub-samples" are reported and the Total Asbestos % represents the composite percentage of all sample layers. These samples were quanitified using a calibrated visual estimate.

055873

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16700 Valley View Avenue, Suite 100
La Mirada, California 90638
Tel: (714) 523-9811
Fax: (714) 523-9810
www.encorp.net

CLIENT: Glendale USD DATE: 2-8-18 PAGE: 1 OF 1

JOB NO: CL18086. G01 INSPECTORS: LAB Analysis

LOCATION: Kepply Elem. Bldg. 1000

SAMPLE NO.	LAB ID #	SAMPLE LOCATION	MATERIAL DESCRIPTION	CONDITION	QUANTITY	% ASBESTOS
1.	742136	Roof Section A-	Roof Core			Shingle Black/Silver 4FC TAR Black 100M FELT Black 20CF
2.	742137	Roof Section B-	Roof Core			Shingle Black/Silver 4FC TAR Black 100M FELT Black 20CF
3.						
4.						
5.						
6.						
7.						
8.						
9.						
0.						

ABBREVIATIONS:

TYPES OF MATERIALS:	CONDITION:	OTHER:
S = Surface Material TSI = Thermal Systems Insulation M = Miscellaneous Material	G = Good D = Damaged SD = Significantly Damaged	S.F. = Square Feet L.F. = Linear Feet

CHAIN OF CUSTODY

Sampled by: Date/Time:

Relinquished/Received By: RK Date/Time: 2/8/18 1215

Relinquished/Received By: Date/Time:

Comments/special Instructions:

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16700 VALLEY VIEW AVE. STE. 100 LA MIRADA, CALIFORNIA 90638
(714) 523-9811 · FAX (714) 523-9810 · MAIN@ENCORP.NET · WWW.ENCORP.NET

Client Name: Glendale USD
Client Address: 333 West Magnolia Avenue
Glendale, CA 91204
Facility Name: R D WHITE ES-BLDG 1000
Facility Address:

Reference Batch Number: 055874
Sampled Date:
Sampled By:
Analyzed By: RONNIE KENESON

Project Number: CL18087 . G01
Date Received: 2/8/2018
Date Analyzed: 2/8/2018

LABORATORY TEST REPORT

BULK ASBESTOS FIBER ANALYSIS (PLM) EPA-600/R-93/116: Interim Method for the Determination of Asbestos In Bulk Insulation Samples

Sample Number	Field/ Client Number	SAMPLE DESCRIPTION			Friable or Non- Friable	CVE Asbestos Type(%)	Non Asbestos (%)
		Sample Location/Activity	Color	Material			
742138A	1A	ROOF SECTION A	BLACK/SILVER	ROOF CORE-SHINGLE	FR	NONE DETECTED	6% FIBROUS GLASS 94% MATRIX
742138B	1B	ROOF SECTION A	BLACK	ROOF CORE-TAR	FR	NONE DETECTED	100% MATRIX
742138C	1C	ROOF SECTION A	BLACK	ROOF CORE-FELT	FR	NONE DETECTED	10% CELLULOSE 90% MATRIX
742139A	2A	ROOF SECTION B	BLACK/SILVER	ROOF CORE-SHINGLE	FR	NONE DETECTED	6% FIBROUS GLASS 94% MATRIX
742139B	2B	ROOF SECTION B	BLACK	ROOF CORE-TAR	FR	NONE DETECTED	100% MATRIX
742139C	2C	ROOF SECTION B	BLACK	ROOF CORE-FELT	FR	NONE DETECTED	10% CELLULOSE 90% MATRIX
742140A	3A	ROOF SECTION C	BLACK/SILVER	ROOF CORE-SHINGLE	FR	NONE DETECTED	6% FIBROUS GLASS 94% MATRIX
742140B	3B	ROOF SECTION C	BLACK	ROOF CORE-TAR	FR	NONE DETECTED	100% MATRIX
742140C	3C	ROOF SECTION C	BLACK	ROOF CORE-FELT	FR	NONE DETECTED	10% CELLULOSE 90% MATRIX

-NOTES: ND=None Detected Asbestos is not quantifiable below the method detection limit of one (1) percent. Amphibole asbestos includes amosite, crocidolite, anthophyllite, tremolite and actinolite. (FR) = Friable, (NF) = Non-Friable. Condition of sample is as received by the laboratory. Our policy is to retain all samples for a period of thirty days. Accredited by the National Voluntary Laboratory Accreditation Program and Environmental Laboratory Certification for the specific scope of accreditation under NVLAP Lab Code 200878-0 and ELAP certificate no. 2379. Results reported pertain to sample(s) as submitted and does not necessarily apply to other apparently identical or similar materials.

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Client Name: Glendale USD
Client Address: 333 West Magnolia Avenue
Glendale, CA 91204
Facility Name: R D WHITE ES-BLDG 1000
Facility Address:

Reference Batch Number: 055874
Sampled Date:
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Analyzed By: RONNIE KENESON

Project Number: CL18087 . G01
Date Received: 2/8/2018
Date Analyzed: 2/8/2018

LABORATORY TEST REPORT

BULK ASBESTOS FIBER ANALYSIS (PLM) EPA-600/R-93/116: Interim Method for the Determination of Asbestos In Bulk Insulation Samples

Sample Number	Field/ Client Number	SAMPLE DESCRIPTION			Friable or Non- Friable	CVE Asbestos Type(%)	Non Asbestos (%)
		Sample Location/Activity	Color	Material			

Notes:

APPROVED SIGNATURE: RU

Ronnie Keneson , Lab Manager

-NOTES: ND=None Detected Asbestos is not quantifiable below the method detection limit of one (1) percent. Amphibole asbestos includes amosite, crocidolite, anthophyllite, tremolite and actinolite. (FR) = Friable, (NF) = Non-Friable. Condition of sample is as received by the laboratory. Our policy is to retain all samples for a period of thirty days. Accredited by the National Voluntary Laboratory Accreditation Program and Environmental Laboratory Certification for the specific scope of accreditation under NVLAP Lab Code 200878-0 and ELAP certificate no. 2379. Results reported pertain to sample(s) as submitted and does not necessarily apply to other apparently identical or similar materials.

 Where applicable, layers or "sub-samples" are reported and the Total Asbestos % represents the composite percentage of all sample layers. These samples were quanitified using a calibrated visual estimate.

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www.encorp.net

CLIENT: Glendale U.S.D. DATE: 2-8-18 PAGE: 1 OF 1

JOB NO: CL18087, GD1 INSPECTORS: LAB Analysis

LOCATION: R.D. White Elem. Bldg. 1000

SAMPLE NO.	LAB ID #	SAMPLE LOCATION	MATERIAL DESCRIPTION	CONDITION	QUANTITY	% ASBESTOS
1.	742138	Roof Section - B	Roof Core			Shingle Black/Silver Gfc Tar Black 100% Felt Black 10%
2.	742139	Roof Section - C	Roof Core			ND
3.	742140	Roof Section - D	Roof Core			ND
4.						
5.						
6.						
7.						
8.						
9.						
0.						

ABBREVIATIONS:

TYPES OF MATERIALS:	CONDITION:	OTHER:
S = Surface Material TSI = Thermal Systems Insulation M = Miscellaneous Material	G = Good D = Damaged SD = Significantly Damaged	S.F. = Square Feet L.F. = Linear Feet

CHAIN OF CUSTODY

Sampled by: Date/Time:

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Relinquished/Received By: Date/Time:

Comments/special Instructions