## TECHNICAL SPECIFICATIONS INDEX

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**APPENDIX**

Hazardous Materials Information
SECTION 02 41 00
SELECTIVE DEMOLITION

PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Demolition and removal of roof systems and equipment pad waterproofing.
B. Demolition and removal of exterior finishes to perform the roof installation.
C. Protection of building interiors from dirt, dust and damage.

1.02 RELATED SECTIONS
A. Division 1 – General Requirements.
B. Appendix – Hazardous Material Abatement

1.03 SPECIAL JOB CONDITIONS
A. Areas of the building with removed existing roofing, exterior wall finish and sealant shall be made watertight and secured against construction debris falling into the building interior in the same day’s operation.
B. Contractor will verify roof demolition scope with the Construction Manager and/or Architect/Engineer prior to the start of work.
C. The site will be occupied and in use during the work.
D. The Contractor will be responsible for the building watertightness after the existing roofs and waterproofing are removed.

1.04 SUBMITTALS
A. The Contractor shall submit a detailed demolition plan to the Construction Manager, outlining the means and methods to be utilized in the removal, transportation and disposal of the existing roof system and related debris. The removal plan shall also include the Contractor’s proposed methods for interior and exterior protection and cleanup during removal and re-roofing operations. Contractor shall identify the proposed location(s) of dumpsters.
1.05 EQUIPMENT

A. Conveyances: Buggies or wheelbarrows used on roofs shall be limited to 3/8 cubic yard capacity.

B. Chutes: Provide enclosed chutes for debris transfer from the roof vertically for a distance of 10 feet or more. Do not extend chutes in an unbroken line for more than 20 feet, without substantial breaks at intervals not greater than 20 feet. Debris shall not spill from the bottom of the chute directly onto the ground. Direct chutes into an approved construction debris container. Provide a hose with a nozzle connected to an adequate water supply, near chute outlet to wet debris as necessary for dust control.

C. Hoists/Cranes: Provide hoists or cranes to remove debris and transport materials to and from the roof. All materials shall be properly secured to prevent loose materials or debris from breaking loose from hoisting apparatus. Debris to be transported from the roof shall be placed directly in approved construction debris containers. Proper protection of wall areas for their entire height shall be provided in the form of heavy duty tarps secured or affixed to exterior walls directly adjacent to or under the area of hoisting.

D. The use of “bobcat” type removal equipment is prohibited.

E. Mechanical cutting equipment: Roof cutting equipment shall have an operable blade depth setting mechanism, in order to control the cutting depth of the blade and alleviate the potential of damage to the structural deck.

PART 2 – MATERIALS

NOT USED

PART 3 – EXECUTION

3.01 PREPARATION

A. Provide, erect, and maintain temporary barriers and security devices as required for performance of the Work.

B. Protect existing landscaping materials, appurtenances, structures, and finish materials that are not to be demolished.

C. Mark location of utilities.

D. Protect existing structures and paving from damage or displacement.

E. Where nature of demolition requires their use, erect and maintain trash and dust chutes for disposal of materials, rubbish and debris (See Paragraph 1.05).
3.02 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent occupancies.

B. Conduct operations with minimum interference to public or private accesses. Maintain egress and access at all times.

3.03 DEMOLITION

A. Disconnect, cap, and identify designated utilities within demolition areas; protect those utilities to remain from damage.

B. Remove materials to be re-installed or retained. Store and protect in manner to prevent damage.

C. Remove demolished materials and debris from site.

D. Do not burn or bury materials on site.

E. Leave site in clean condition.

F. Remove temporary work.

3.04 STORAGE AND DISPOSAL

A. Items to be removed, stored, and protected for re-installation: As indicated on the Drawings and herein, including but not limited to the following:

1. All mechanical units, condensate lines or communications items that may require removal and reinstallation during reconstruction.

B. Items to be removed: As indicated on the Drawings and herein, including but not limited to the following:

1. Roof systems, underlying insulation, and features as indicated on the Drawings.
2. Waterproofing systems on equipment pads as indicated on the Drawings.

C. Debris disposal:

1. All debris shall be transported to dumpsters at ground level by enclosed chute. Uncontrolled dropping of debris to ground level will not be permitted. Control visible emissions at the dumpster location by wetting the debris with a fine spray of water at the dumpster level and by providing a tarp cover over the dumpster.
2. Dispose of all debris in accordance with all applicable local, State, Federal regulations for the proper transportation and disposal of roofing materials at an approved landfill.

3.05 CLEANING

A. Clean, restore and/or replace items stained, dirtied, discolored or otherwise damaged due to the Work, as required by the Owner.

B. Clean roof, building (interior and exterior), and surrounding areas so they are free of trash, debris and dirt caused by, or associated with the Work.

C. Clean out drain leaders and piping to the point where it exits the site. Water test all downspouts and drains prior to and after construction by running water from a hose into each gutter and downspout in the presence of the Owner and/or Owner Representative.

D. Sweep site and paved areas clean daily.

END OF SECTION
SECTION 07 14 16
COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Waterproofing of equipment pads.

1.02 RELATED SECTIONS
A. Section 07 52 16 – Modified Bitumen Membrane Roofing
B. Section 07 60 00 – Flashing and Sheet Metal

1.03 SPECIAL JOB CONDITIONS
A. Comply with application temperatures of the manufacturer.
B. The Contractor shall utilize skilled and experienced specialty workers to install the Work. Experienced trade workers shall be utilized for all aspects of the Work.

1.04 SUBMITTALS
A. Submit Manufacturer literature, specifications and color charts for the sealants and primers.
B. Shop drawings that show locations and extent of waterproofing and details.
C. Manufacturer letter stating that the Applicator is an approved applicator and is qualified for the specified warranty.
D. Sample warranty.

1.05 WARRANTY
A. Manufacturer’s no-dollar-limit warranty for fifteen (15) years.
B. Contractor’s labor and material warranty for three (3) years.

PART 2 - MATERIALS

2.01 MATERIALS – GENERAL
A. Source limitations for Waterproofing System: Obtain waterproofing materials from a single source manufacturer.

2.02 POLYESTER WATERPROOFING

A. Products: Kemper System, Inc.: Kemperol 2K-PUR or approved equal.

2.03 AUXILLIARY MATERIALS

A. General: General: Provide auxiliary materials recommended in writing by the waterproofing manufacturer for intended use and compatible with one another and with the waterproofing.

B. Primer: Manufacturer’s standard primer, sealer, or surface conditioner; factory-formulated acrylic latex, polyurethane, or epoxy.

C. Membrane-Reinforcing Fabric: Manufacturer’s recommended polyester fabric, manufacturer’s standard weight.

D. Joint Reinforcement Strip: Manufacturer’s recommended polyester fabric.

E. Surface Aggregate: As recommended by manufacturer for maintenance pedestrian traffic.

F. Finish Coating: Manufacturer’s recommended seal coating for application indicated, clear or color matching the waterproofing membrane.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the concrete substrate after the existing waterproofing has been removed.

B. Verify substrate is dry and within the moisture limits recommended by the manufacturer.

3.02 PREPARATION

A. Clean, prepare and treat substrate according to manufacturer’s written instructions.

B. Protect adjacent areas from spillage and overspray.

C. Remove grease, bitumen, and all other existing waterproofing remnants from concrete. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate per ASTM D4259 with a self-containing, recirculating, blast-cleaning apparatus. Remove material to provide sound surface.
3.03 TERMINATION, CORNER AND PENETRATION PREPARATION

A. Prepare surfaces at terminations and penetrations through waterproofing and corners in accordance with manufacturer’s written instructions.

B. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first application coat, when recommended by the manufacturer.

3.04 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill cracks and joints in substrate according to the manufacturer’s written instructions.

B. Prime substrate along each side of joint/crack at least 6 in.

3.05 WATERPROOFING APPLICATION

A. Apply waterproofing per manufacturer’s written instructions and to recommendations in ASTM C898/C1471.

B. Apply primer over prepared surface unless otherwise instructed in writing by the waterproofing manufacturer.

C. Reinforced Waterproofing Applications: Mix materials and apply waterproofing by roller, notched squeegee, trowel, or other suitable application method.

1. Apply the first coat of waterproofing, embed membrane-reinforcing fabric into wet first coat, and apply second coat of waterproofing to completely saturate reinforcing fabric and to obtain a seamless membrane free of entrapped gases and pin holes, with an average dry film total thickness of 70 mils.

2. Apply reinforced waterproofing to prepared horizontal and vertical surfaces.

3. Verify the manufacturer’s recommended wet film thickness every 100 square feet.

D. Cure waterproofing, taking care to prevent contamination and damage during application and curing.

E. Aggregate Finish Surfacing:

1. Broadcast surface aggregate into a bonding coat application of waterproofing, spread slightly in excess of manufacturer’s recommended application rate over clean, cured membrane to obtain uniform and full coverage.
2. Allow bonding coat to cure for 24 hours, minimum.

3. Remove loose aggregate by blowing with oil-free compressed air or by vacuum. Re-broadcast clean aggregate as required to provide full embedment and coverage of membrane.

4. Seal aggregate surface with sealing coat application of finish coating, applied at manufacturer’s recommended application rate.

5. After completion of surfacing, avoid traffic for at least three (3) days.

3.06 PROTECTION

A. Do not permit foot traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by the manufacturer of the affected construction.

END OF SECTION
SECTION 07 52 16

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. This Section specifies requirements for the new roof systems as shown on the Drawings:
   1. Provide new 2-ply, cold process adhesive, modified bitumen roof membrane with 2-ply modified bitumen base flashings and strippings.

1.02 RELATED SECTIONS

A. Section 07 60 00 – Flashing and Sheet Metal
B. Section 07 90 00 - Sealants

1.03 SUBMITTALS

A. Certificates of Compliance: Roof membrane manufacturer's certification that materials are chemically and physically compatible with each other and suitable for inclusion in roof system and are acceptable for warranty specified. Do not submit materials without obtaining membrane manufacturer's written certification. Explicitly identify in writing, difference between manufacturer's written requirements and these specifications, and membrane manufacturer's approval of proposed asphalt source.

B. Product data: For each product specified in Part 2.

C. Shop Drawings: Plans, elevations, sections, details, and attachments to other work.
   1. Base flashings, cants, and membrane termination.

D. Samples:
   1. Smooth membrane sheet

E. Warranties

F. Contractor’s letter certifying a minimum of 5-years commercial modified bitumen roofing experience with list of project references, including names and phone numbers.
G. Letter from roofing manufacturer stating that the Contractor is an applicator in good standing and is qualified for the specified warranty.

1.04 QUALITY ASSURANCE

A. Manufacturer Approval:

1. Installer Qualifications: Approved by manufacturer to install manufacturer’s products. A single applicator with a minimum of five years previous successful experience in installations of similar systems.

2. Source Limitations: To greatest extent possible, obtain auxiliary materials for roofing system from roofing membrane manufacturer. Provide letter of acceptance from manufacturer for auxiliary materials from other sources.

3. System Approval: Provide statement from manufacturer that specified roof system meets requirements for requested warranty.

4. Comply with manufacturer’s written instruction and these Specifications for roofing and associated work. Provide skilled tradesmen experienced in installation of 2-ply modified bitumen roofing systems. Foreman shall have a minimum of 5 years of 2-ply bitumen membrane installation experience.

5. Identify in writing specific contract requirements that are not approved or warrantable by manufacturer.

B. Minimum quality standards: Comply with NRCA/ARMA publications “Quality Control Guidelines for the Application of Built-up Roofing” and “Quality Control Guidelines for Polymer Modified Bitumen Roofing”. Standards within these specifications that exceed NRCA/ARMA shall prevail.

C. Regulatory Requirements

1. Federal regulations, safety standards, and codes mandated in the United States.

2. Products Manufactured in Countries Outside of United States: Products shall be approved by governing/sanctioning entity for country in which project is located and/or product is manufactured.

3. Classified by Underwriters’ Laboratories, Inc. as a Class A roof covering.

4. Classified by Factory Mutual (FM) Engineering as a Class I, approved assembly.

   a. FM I-75
5. Install in accordance with manufacturer's current published application procedures and recommendations of the National Roofing Contractor's Association.

D. Have no deviations made from this Specification or the approved shop drawings without prior written approval of Architect/Engineer.

E. Perform entire work of this Section in accordance with the best standards of practice relating to the trades involved.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Store materials in accordance with manufacturer's recommendations. Store rolled goods on clean raised platforms. Store other materials in dry area, protected from water and direct sunlight, and maintain at a temperature of 60 to 80 degrees Fahrenheit.

C. Provide continuous protection of materials against deterioration.

D. Materials Stored on Roof Levels for Immediate Use.

1. Distribute to prevent concentrated loads that would impose excessive strain on deck and supporting it structural members.

2. Positively secure to prevent displacement by wind.

3. Tarp for protection from exposure.

4. Cut and remove manufacturer's plastic "shrink wrapping" from materials during storage.

1.06 PROJECT CONDITIONS

A. Existing Conditions: Examine existing building and decking to determine physical conditions that affect installation of roofing.

B. Environmental Requirements:

1. Apply roofing in dry weather.

2. Do not expose membrane and accessories to a constant temperature in excess of 180 degrees Fahrenheit.

C. Protection
L-1120 Gymnasium Roof Replacement  
Los Medanos College, Pittsburg, California

1. Provide special protection or avoid heavy traffic on completed work when ambient temperature is above 80 degrees Fahrenheit.

2. Restore to original condition or replace work or materials damaged during handling or roofing materials.

D. Emergency Equipment: Maintain on-site equipment necessary to apply emergency temporary edge seal in the event of sudden storms or inclement weather.

E. Always keep a minimum of two fully charged 20-pounds dry chemical fire extinguishers in, separate and easily accessible, torch work locations.

1.07 SEQUENCING AND SCHEDULING
A. Do not install more roofing in one day than can be sealed with roofing and flashing the same day.

1.08 GUARANTEES AND WARRANTIES
A. Roofing Material Manufacturer's Warranty: Install in such a manner that the roof system manufacturer will furnish a written warranty agreeing to replace/repair defective materials, including leakage of water, abnormal aging or deterioration of materials, and other failures of the materials to perform as required within warranty period. Warranty period is twenty (20) years.

B. Contractor's Workmanship Warranty: In addition, furnish a written warranty agreeing to repair/replace defective installation and workmanship labor causing leakage of water, deterioration of materials, and other failures of the installed system, sealants, painting, coatings, and related work on this project, to perform as required within the warranty period. Warranty period is two (2) years.

PART 2 – PRODUCTS

2.01 PRODUCT PERFORMANCE
A. Provide products fully compatible with substrates and other assembly components. Materials shall be approved for UL Class A fire rating service and meet FM1-75 (minimum) wind uplift requirements.

B. Modified bitumen products and systems shall comply with test methods designated in ASTM D 5147-91.

2.02 MODIFIED BITUMENT SHEETS
A. 2-ply Roofing Membrane: ASTM D 6164, Grade S, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for cold
process adhesive application. Base Ply: Ruberoid 20 by GAF or approved equal. Top Ply: Ruberoid SBS FR by GAF or approved equal.

B. Modified Bitumen Base Flashing Ply: ASTM D 6164, Grade S, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for cold process adhesive application.

C. Modified Bitumen Top Ply: ASTM D 6164, Grade G, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; white granule surfaced; suitable for application by torching. Base Ply: Ruberoid 20 by GAF or approved equal.

D. Flashing Ply: Base Flashing: Ruberoid 20 by GAF or approved equal.

2.03 AUXILIARY ROOFING MATERIALS

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

B. Asphalt Primer: ASTM D 41

C. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied modified bitumen adhesive specially formulated for compatibility and use with roofing membrane. Field Adhesive for horizontal applications: Matrix 102 by GAF or approved equal. Adhesive for vertical applications: Matrix 202 by GAF or approved equal.

D. Sealant: One-part polyurethane, gunnable grade, high performance elastomeric sealant: ASTM C 920, Type S, Grade NS, Class 25, use NT.

E. Cant Strip: wood fiber cant strips.

F. Termination Bar: 34 mm wide, pre-punched metal strip of a U-shaped profile with holes 150 mm (6 inches) on center maximum spacing. Use to secure vertical termination of the flashing top ply.

G. Polyethylene Slip Sheet: 6 mils minimum thick polyethylene.


I. Base Flashing Coating: SBR or SEBS Butyl rubber based bright white coating engineered to be applied over the specified roof system and to resist the effects of ponded water.

J. Insulation: EnergyGuard Tapered Polyiso Foam Roof Insulation Board by GAF or approved equal.
K. Insulation Adhesive: GAF Olybond 500 or approved equal.

L. Coating: Topcoat MB Plus by GAF or approved equal.

M. Liquid-Reinforced Coating: Major Seal Liquid Flashing by GAF or approved equal.

N. Flat Stock Insulation: A rigid isocyanurate board with factory-applied fiberglass bituminous felts on both sides. Conforming to HH-I-530A (Type II, unfaced) and C1289-01, Type II, Class 1, Grade 2 with an average density of 2.0 lbs. per cubic foot. Flame spread rating of 35 or less and smoke development rating of 75 to 160 in accordance with ASTM E84. Manufacturer: EnergyGuard PolyISO by GAF or an approved equal. The board size: 4 foot by 4 foot minimum.

O. Cover Board: ¼ in. thick board.

PART 3 – EXECUTION

3.01 PREPARATION

A. Verify that the substrate is suitable for membrane application.

B. Prime masonry, concrete, and sheet metal surfaces in contact with bituminous materials, including sheet metal flanges (both sides) and lead sheet at drain sumps (both sides) with asphaltic primer prior to roofing or flashing installation. Allow primer to dry thoroughly prior to installing bituminous flashings.

C. Do not deliver to site or install a material or system that has not been approved. Remove materials installed without prior approval upon Owner’s request.

D. Surfaces to receive new membrane and flashings shall be clean and thoroughly dry. Should surface moisture such as dew exist, provide necessary equipment to dry surface prior to application. Do not dry with open flames.

E. Comply with Midwest Roofing Contractors Association MRCA publication “Safety in Torch Welded Roofing” specified to operation of liquefied petroleum gas (propane) hand torches and kettle.

F. All reinforcing plies, self-adhering membrane envelopes, and base flashings must be installed concurrently with roof membrane installation work, and must be complete and up to date by end of each work week (i.e. Friday or next working day).

3.02 INSULATION AND COVER BOARD INSTALLATION

A. Install insulation and cover board in adhesive, following the manufacturer’s written instruction. Comply with FM I-75.
3.02 BASE PLY MEMBRANE SHEET INSTALLATION

A. Sheets shall be laid parallel to longest dimension of tapered area to be roofed and/or perpendicular to slope of area. Application shall start at low point of area working to high point. Laps shall be parallel to slope of short dimension of tapered area and in no case, shall laps buck flow of water. Stagger end laps and side laps relative to base sheet laps by 12 in., minimum.

B. Unroll dry membrane on substrate and align with adjacent sheet, providing 3 in. side laps and 6 in. end laps. Stagger end laps of adjacent sheets by 12 in. minimum. Reroll approximately one-half of dry membrane sheet while maintaining alignment.

C. Apply adhesive in accordance with roof manufacturer’s written instructions. Membrane is not to be walked on while adhesive is not completely cured.

D. Membrane sheets shall be applied free of wrinkles, creases, fishmouths, or voids. Maintain alignment of sheets utilizing marked lap lines. Should lap lines become misaligned while unrolling, cut sheet and establish a new end lap. Do not attempt to realign a partially adhered membrane roll.

E. Inspect ply sheet application for defects. Cut wrinkles, creases, and fishmouths to relax membrane. Apply a full width strip of base ply membrane over defect in a full mopping of hot asphalt and lapped a minimum of 3 in. beyond cut. Unbonded lap seams of more than ½ in. wide shall be reheated and rolled-in.

3.03 REINFORCING PLY INSTALLATION

A. Verify that repairs have been made to field membrane in areas adjacent to flashing area.

B. Cut reinforcing plies for horizontal metal flange applications wide enough to provide full coverage of flange and 6 in. onto membrane. Ensure that membrane is solidly set with no voids. Provide 3 in. laps at end of strips.

C. Cut reinforcing plies across width of roll for base flashings at walls, curbs, and other vertical applications to lengths sufficient to provide full coverage to top of vertical element, across cant, and 6-inches onto horizontal surface of built-up membrane.

D. Provide 3-inch laps and stagger laps.

3.04 TOP PLY MEMBRANE SHEET INSTALLATION

A. Verify that all repairs have been made to the field membrane and reinforcing plies have been properly installed. Surfaces should be free of sawdust, dirt, insulation debris, and other contaminants prior to starting installation.
B. Sheets shall be laid perpendicular to the flow of water starting at the low point of the area and working to the high point. Unroll dry membrane and allow it to relax. Provide 3 in. side laps and 6 in. end laps, and stagger end laps of adjacent cap sheets by 24 in. Align the granulated side of the sheet over the salvage side of the adjacent sheet. While maintaining alignment, reroll approximately one-half of the dry membrane sheet.

C. Apply adhesive in accordance with manufacturer’s written instructions.

D. Sheets shall be applied free of wrinkles, creases, fishmouths, or voids. Maintain alignment of sheets utilizing marked lap lines. Should the lap lines become misaligned while unrolling, cut the sheet and establish a new end lap. Do not attempt to realign a partially adhered membrane roll.

E. Inspect sheet application for defects. Cut wrinkles, creases, and fishmouths to relax the membrane. Apply a full width strip of cap sheet membrane over the defect, lapped a minimum of 6 in. beyond the cut. Unbonded lap seams of more than 1/2 in. wide shall be reheated and rolled.

3.05 FLASHING AND STRIPPING SHEET INSTALLATION

A. Apply stripping sheets using detail torch manufactured specifically for roofing membrane applications.

B. Ensure that other wood, wood fiber, and other combustible components are enveloped with base sheet or ply sheet material. Maintain fire watch during and after torch applications.

C. Verify repairs have been made to field membrane in area adjacent to cant to receive flashing sheet. Snap chalk line distance of 100-mm minimum from edge of reinforcing ply and on field side of roof.

D. Install three-course flashing over termination bars and top of base flashing.

3.06 TEMPORARY PROTECTION

A. Unfinished perimeter and penetration components: Provide temporary waterstops adequate to prevent moisture intrusion into newly installed work around exposed edges and incomplete flashing locations. Remove temporary materials completely prior to continuing with subsequent work.

B. Tie-ins: Provide temporary waterstops at deck and tie-ins between newly installed and existing membrane as detailed. Inspect tie-ins thoroughly and repair as needed to provide watertight assembly prior to leaving site.
3.07 COATING

A. Ensure roof system is clean, dry and acceptable for roof coating.

B. Apply first coat over the existing exposed top ply using brush or spray applied techniques. Provide reinforcing mesh at inside and outside. Apply first coat using the manufacturer’s recommended application rates but in no case less than 2 gallons per 9.2 sm.

C. Allow first coat to dry 12-15 hours and apply second or top coat using the manufacturer’s recommended application rates but in no case less than 2 gallons per 9.2 sm. The finished product shall provide a bright white appearance.

END OF SECTION
SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Sheet metal flashings shown on the Drawings

1.02 RELATED WORK
A. Section 07 52 16 – Modified Bitumen Roofing
B. Section 07 14 16 – Cold Fluid-Applied Waterproofing
C. Section 07 90 00 – Sealants

1.03 REFERENCES
A. ASTM A153 – Zinc Coating Hop Dip
B. SMACNA – Architectural Sheet Metal Manual
C. MIL-S-687ZB – General Specifications for Soldering Process
D. AWS D1.1 – Structural Welding Code

1.04 SUBMITTALS
A. Submit three (3), 6 inch by 6 inch samples, of each type and thickness of sheet metal to be used in the construction.
B. Submit three (3), samples of gutter assembly and flashings to be used in the construction.
C. Submit shop drawings with dimensions of all sheet metal details.
D. Submit mill certification.
E. Submit manufacturer literature for all accessory items in Part 2 of this Section.

1.05 STORAGE
A. Stack performed material to prevent twisting, bending, or abrasion, and provide ventilation.
B. Prevent contact with materials during storage, which may cause discoloration, staining or damage.

PART 2 - PRODUCTS

2.01 SHEET MATERIALS

A. Sheet Metal
   1. 22 gauge galvanized and bonderized steel: ASTM A123 and A525.

B. Lead
   1. Minimum weight of 4 pounds per square foot.

C. Steel bars
   1. ASTM A36.

2.02 FINISHES

A. Not applicable.

2.03 ACCESSORIES

A. Fasteners
   1. Sheet Metal-to-Wood Blocking: No. 12, 1-1/2 inch minimum long Stubbs stainless steel nails, annular-thread shank.
   2. Sheet Metal-to-Sheet Metal: No. 10, 1 inch long stainless steel sheet metal screws with metal capped neoprene washers.
   4. Unistrut: 3/8 inch diameter lag bolts, 3 inch long minimum.

B. Solder
   1. 50% tin and 50% lead.
   2. Flux: ASTM B32

C. Sealant and Backer Rod
   1. Refer to Section 07 90 00 – Sealants.

D. Miscellaneous
2. Cold galvanized compound: Zinc-rich, spray-applied compound.

3. Drain Pipes: Schedule 40 cast iron, wall thickness ¼ in.

4. Drains: Z-121 by Zurn Industries, or approved equal.

2.04 FABRICATION SCHEDULE

A. All sheet metal to be 22 gauge galvanized and bonderized steel except as noted below.

B. Lead

1. Plumbing Vent Flashings and Caps

2.05 FABRICATION

A. Form sections true to shape, accurate in size, square and free from distortion or defects.

B. Form pieces to maximum length of 8 feet.

C. Mechanically fasten and solder watertight joints, splices and transitions which are not designed for expansion.

1. Fasten metal for strength by solid riveting, welding or forming double lock seams.

2. Seal metal for water tightness by soldering. Immediately upon completion, remove all traces of acid or flux with appropriate neutralizer, followed by repeated washing and scrubbing.

3. Sealant-filled joints shall not be substituted for soldered joints. Use sealant as indicated on the Drawings.

D. Do not fabricate any sheet metal components without approved shop drawings and fabrication samples.

PART 3 - EXECUTION

3.01 INSPECTION

A. Field measure site conditions prior to fabricating any component. Notify Architect/Engineer immediately of any inconsistency between existing conditions and the drawings.

B. Beginning of installation means contractor’s acceptance of existing conditions.

3.02 PREPARATION
A. Allow substrates to dry thoroughly. Do not proceed with flashing application if moisture content of exposed wood substrate is above 19%.

B. Clean debris from all substrates.

3.03 INSTALLATION

A. General

1. Proceed with sheet metal installation in conjunction with roofing and flashing in each area.

2. Do not dilute primers, coatings, or sealants.

3. Keep containers closed except when removing materials from them.

4. Field fabricate sheet metal following the same criteria set forth in Paragraph 2.05 – FABRICATION.

5. Except as otherwise specifically shown on the Drawings or approved shop drawings, conform to the drawing details included in the latest edition of SMACNA Manual.

6. Comply with Military Specification MIL-S-6872B entitled, "General Specifications for Soldering Process" when forming soldered joints. Use conduction soldering methods. Areas to be joined shall be cleaned of all oil, grease, pencil marks, paint, dirt or other foreign substances. Remove all burrs using files, grinding stones or other methods. Hold parts in place using clamps, jigs and supports or by self-fixturing. If parts are tack-soldered to hold them in place, the area of tack-soldering shall be reworked into the final soldering. Parts cannot be allowed to move during the soldering process.

7. All corners, transition and termination pieces shall be mechanically fastened and soldered to provide strength and a watertight connection.

8. Apply sealant over the head when using pop rivets for fastening.

9. All sheet metal edges shall be hemmed 1/4 inch minimum.

10. Roof deck flanges shall be 4 inches wide minimum.

11. Set roof flanges in roof cement and nail 3 inches on center staggered.

12. Prime and flash all roof flanges (top and bottom) in accordance with this Specification.

13. Flux shall be applied to all surfaces that will receive solder. Flux-cored solder shall not be used. Flux shall be fluid when heated and be effective...
in removing oxides and other impurities from the joint. Flux should be readily displaced by the molten solder.

14. Areas to be joined shall be heated above the liquious temperature of the solder. To deliver maximum heat, the copper bit of the soldering iron shall be applied at the right angle so that the flat side of the iron's bit provides maximum contact area. Solder shall be applied to the joint and not the bit of the iron. Allow solder to flow in place to provide a minimum 1 inch final width of solder over the joint. Joint shall not be disturbed until it has been allowed to completely cool. After soldering, completely remove all flux and acid by washing and scrubbing with a neutralizing agent.

B. Hook Strips

1. Hook strips shall be formed with a 3 inch face and a 3/4 inch kick, bent out at a 60° angle to the face (or 30° to the wall).

2. Secure continuous hook strips to wood blocking with nails spaced at 6 inches on center.

3. Provide butt joints with 1/8 inch gap between adjacent hook strip sections.

C. Securement Clips

1. Securement clips shall be 6 inches long, 2 inches wide, and hemmed along each side of the long dimension.

2. Secure clips to substrate with specified fasteners. Use a minimum of two (2) clips. Space clips 32” o.c. maximum.

3. Bend clips a minimum of 1 inch over bottom drip edge of counterflashing and crimp tightly.

D. Counterflashing

1. Install counterflashing in accordance with approved shop drawings and manufacturer's product data to comply with specified performance requirements. Reglet and counter flashing components shall be true to line, without buckling, creasing, warp or bind in finished surfaces.

2. Coordinate counterflashing at roof surfaces with roofing work to provide weather tight condition at roof terminations.

3. Isolate dissimilar materials to prevent electrolysis. Separate bituminous coating.

4. Secure counterflashing using continuous cleats, clips and fasteners in accordance with product data and as indicated.
E. Skirt Flashing

1. Skirt flashings shall be formed with a 4 inch face and a ¾ inch kick, bent out a 60° angle to the face (or 30° to the wall).

2. Secure skirt flashings to the existing counterflashings with stainless steel rivets at all areas where existing counterflashings are being reused. Clean existing counterflushing and apply sealant over rivets.

F. Gravel Stop and Edge Metal

1. Secure continuous hook strips with the specified fasteners as previously specified.

2. Form gravel stop/edge metal cover plates to the dimensions indicated.

3. Apply asphalt primer to both the top and bottom sides of the roof deck flanges.

4. Provide 6 inch wide cover plates, set in full bed of sealant over all 1/8 to ¼ inch wide butt joints in adjacent sheet metal sections. Hem edges of cover plates to fit snugly against fascias (gravel stops and/or edge metal). Stagger butt joints between the hook strips and the fascias (gravel stops and/or edge metal).

G. Vent Pipes

1. Provide new vent pipe sleeve with integral roof deck flange and cap. All seams shall be locked and soldered.

2. Slide sleeve over vent pipe and secure and flash it’s flange to wood or concrete substrate. Set cap in full bead of sealant over top of vent pipe.

3. Prior to installing flashing extend vent pipes as required in accordance with acceptable plumbing standards and codes, but not less than 8 inch above adjacent finished roofing surface, unless noted otherwise.

END OF SECTION
SECTION 07 90 00

SEALANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sealant for sheet metal joints
B. Sealant for hot pipes

1.02 RELATED SECTIONS

A. Section 07 52 16 – Modified Bitumen Membrane Roofing
B. Section 07 60 00 – Flashing and Sheet Metal

1.03 SPECIAL JOB CONDITIONS

A. Comply with application temperatures of the manufacturer.
B. The Contractor shall utilize skilled and experienced specialty workers to install the Work. Experienced trade workers shall be utilized for all aspects of the Work.

1.04 SUBMITTALS

A. Submit Manufacturer literature, specifications and color charts for the sealants and primers.

PART 2 - MATERIALS

2.01 SEALANT

A. Metal-to-metal joints: One-part polyurethane conforming to ASTM C920 such as NP-1 by Sonneborne. Color to be selected by Owner.
B. Concealed metal-to-metal joints: One-part butyl sealant conforming to ASTM C1085.
C. Hot pipes: A non-corrosive one-part silicone, with a service temperature from -60° F to +400° F, such as Dow Corning 999-A or approved equal.
2.02 ACCESSORIES

A. Backer rod: Round, closed cell polyethylene with a waxed surface; size shall be sufficient to be compressed 25% to fit the joint width.

B. Primer, cleaners and similar joint preparation materials shall be as recommended by the sealant manufacturer.

PART 3 - EXECUTION

3.01 GENERAL WORKMANSHP

A. All materials shall be stored in secure, dry locations and be protected from the environment.

B. Follow manufacturer’s environmental limitations and material storage requirements.

C. Provide all devices (including heaters and insulation) necessary to maintain the correct temperature and humidity for proper curing.

3.02 CONCEALED SHEET METAL LOCATIONS

A. Provide sealant at all concealed sheet metal joints and as detailed.

B. Use full beads of sealant along entire length of joints.

3.03 HIGH TEMPERATURE SEALANT

A. Install high temperature sealant at high temperature locations where required. Provide a full bead of sealant beneath storm hood locations as detailed.

3.04 REPRESENTATIVE SAMPLING

A. Extract representative samples of new sealant joints for inspection as directed by and in the presence of the Owner.

END OF SECTION
APPENDIX

HAZARDOUS MATERIAL INFORMATION
Pre-Renovation Asbestos Survey

Gymnasium Roof
Los Medanos College
Pittsburg, California

February 3, 2017
Terracon Project No. R1167F96

Prepared for:
Contra Costa Community College District
Martinez, California

Prepared by:
Terracon Consultants, Inc.
Emeryville, CA
February 3, 2017

Contra Costa Community College District
500 Court Street
Martinez, CA 94553

Attn: Critical Solutions, Inc.
Alex Gourtzelis – alex_g@csipm.com
Rob Mohr – robm@csipm.com

Re: Pre-renovation Asbestos Survey Report
Gymnasium Roof
Los Medanos College
2700 East Leland Road
Pittsburg, California 94565
Terracon Project No. R1167F96
4C District PO: B0007508

Dear Mr. Gourtzelis:

Terracon Consultants, Inc. (Terracon), formerly RGA Environmental, is pleased to submit the attached report for the above referenced site. The purpose of this report is to summarize the results of a pre-renovation asbestos survey conducted on January 30, 2017. This survey was conducted in general accordance with our proposal dated November 16, 2016. We understand that this survey was requested due to planned renovation activities.

Terracon appreciates the opportunity to provide this service to the Contra Costa Community College District. If you have any questions regarding this report please contact the undersigned at 510-547-7771.

Sincerely,
Terracon Consultants, Inc.

Steffen Steiner, CAC #92-0850  Ken Pilgrim, CAC #03-3503
Office Manager       Department Manager
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**APPENDIX B** ASBESTOS SURVEY SAMPLE LOCATION SUMMARY  
**APPENDIX C** ASBESTOS ANALYTICAL LABORATORY DATA  
**APPENDIX D** LICENSES AND CERTIFICATIONS  
**APPENDIX E** SAMPLE LOCATION DRAWINGS
EXECUTIVE SUMMARY

Terracon Consultants, Inc. (Terracon), formerly RGA Environmental, Inc., conducted a pre-renovation asbestos survey limited to roofing materials present on the roof of the gymnasium at the Los Medanos College located at 2700 East Leland Road in Pittsburg, California. We understand this survey was requested due to the planned roof replacement for this building. The purpose of the survey was to sample and identify suspect asbestos-containing materials (ACM) and provide information regarding the identity, location, condition, and approximate quantities of ACM that may represent a worker safety hazard if disturbed or require special handling and/or packaging as part of removal during the planned construction activity. The survey was conducted on January 30, 2016 by Steffen Steiner and Ken Pilgrim, California Certified Asbestos Consultants (CACs). The survey was conducted in general accordance with our proposal dated November 16, 2016 and the sampling protocols established in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763, Subpart E, known as the Asbestos Hazard Emergency Response Act, (AHERA). During the survey, Terracon collected a total of 26 bulk samples from nine (9) homogeneous areas of suspect ACM.

The following asbestos containing materials were reported by the analytical laboratory as containing detectable asbestos:

<table>
<thead>
<tr>
<th>Material Description (asbestos percentage)</th>
<th>Material Location</th>
<th>Estimated Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar &amp; Gravel Roofing Field (60%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>600 sf</td>
</tr>
<tr>
<td>Roof Curb (65%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>Quantity Included Above</td>
</tr>
</tbody>
</table>

*sf = square feet*
1.0 INTRODUCTION
Terracon Consultants, Inc. (Terracon) conducted a pre-renovation asbestos survey of the gymnasium roof at Los Medanos College located at 2700 East Leland Road, Pittsburg, California. The survey was conducted on January 30, 2017, by Steffen Steiner and Ken Pilgrim, CACs, in general accordance with Terracon’s Proposal dated November 16, 2016. The roofing components and finishes were surveyed and homogeneous areas of suspect asbestos-containing materials (ACM) were visually characterized and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled materials could be located beneath roofing substrates. Suspect ACM samples were collected in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763, Subpart E, known as the Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to an accredited laboratories for asbestos analysis by Polarized Light Microscopy (PLM).

1.1 Project Objective
We understand this asbestos survey was requested due to the planned gymnasium roof replacement as necessary to satisfy requirements of the USEPA 40 CFR Part 61, Subpart M, of the National Emission Standards for Hazardous Air Pollutants (NESHAP).

1.2 Reliance
This report is for the exclusive use of the Contra Costa Community College District (District) for the project being discussed. Reliance by any other party on this report is prohibited without written authorization of Terracon and the District. Reliance on this report by the District and all authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, this report, and Terracon’s Agreement for Services. The limitations of liability defined in Terracon’s Agreement for Services is the aggregate limit of Terracon’s liability to the District.
2.0 BUILDING DESCRIPTION

The survey area included the two (2) roof levels of the gymnasium as designated by the District’s construction management company, Critical Solutions, Inc.

3.0 FIELD ACTIVITIES

The survey was conducted by Steffen Steiner and Ken Pilgrim who are a CACs with Terracon. A copy of their credentials are attached in Appendix D. The survey was conducted in general accordance with the sample collection protocols established in USEPA 40 CFR Part 763, Subpart E, Section 763.86 (AHERA) for asbestos. A summary of survey activities is provided below.

3.1 Visual Assessment

Survey activities were initiated with visual observation of the planned areas of roofing renovation to characterize homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of size, color and texture with consideration given to the date of application.

3.2 Physical Assessment

A physical assessment of each HA of suspect ACM was conducted to assess the friability (asbestos) and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

3.3 Sample Collection

Based on results of the visual observation, bulk samples of suspect ACM were collected from randomly selected locations in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Asbestos samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

The selection of sample locations and frequency of sampling were based on Terracon’s observations and the assumption that like materials in the same area are homogeneous in content.

Terracon collected 26 bulk samples from nine (9) homogeneous areas of suspect ACM. A summary of suspect ACM samples collected during the survey is included as Appendix B. A sample location diagram is provided in Appendix E.
3.4 Sample Analysis

Bulk samples of suspected asbestos containing materials were submitted, under chain of custody protocols, to EMLab P&K in Phoenix, Arizona for analysis of asbestos content by polarized light microscopy with dispersion staining techniques per USEPA methodology 600/R-93/116. The percentage of asbestos, where applicable, was determined by microscopic visual estimation. EMLab P&K is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) Accreditation.

4.0 FINDINGS AND RECOMMENDATIONS

A summary of the classification, condition and approximate quantity of identified ACM is presented in Appendix A, with a summary of all samples analyzed for asbestos in Appendix B. The asbestos analytical laboratory report is presented in Appendix C. A sample location diagram is presented in Appendix E.

The following asbestos containing materials were reported by the analytical laboratory as containing detectable asbestos:

<table>
<thead>
<tr>
<th>Material Description (asbestos percentage)</th>
<th>Material Location</th>
<th>Cal/OSHA Work Class</th>
<th>Waste Category</th>
<th>Estimated Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar &amp; Gravel Roofing Field (60%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>Class II</td>
<td>Category I Non-Friable</td>
<td>600 sf</td>
</tr>
<tr>
<td>Roof Curb (65%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>Class II</td>
<td>Category I Non-Friable</td>
<td>Quantity Included Above</td>
</tr>
</tbody>
</table>

sf = square feet

Terracon recommends that all asbestos containing materials be removed prior to renovation or demolition by a licensed asbestos contractor that is registered with the California Division of Occupational Safety and Health (Cal/OSHA) in compliance with current, applicable federal, state, and local regulations. Removal of the identified ACM must be conducted in compliance with the requirements for Class II asbestos abatement work prior to start of renovation activities. The scope of this survey did not include sampling for other potentially hazardous building materials including lead, PCBs, and Universal Wastes. All uncharacterized paints should be assumed to contain lead until sampling and analysis prove otherwise. Cal/OSHA and Proposition 65 notices to building occupants are required.
5.0  LIMITATIONS/GENERAL COMMENTS

Terracon did not perform sampling requiring demolition or destructive activities such as coring through roofing substrates or dismantling of equipment. Reasonable efforts to access suspect materials within known areas of restricted access were made. Sampling did not include suspect materials which could not be safely reached.

This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was performed, and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by the Contra Costa Community College District for specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.
APPENDIX A

IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)
IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

<table>
<thead>
<tr>
<th>Homogeneous Area/s</th>
<th>Material Description (chrysotile asbestos percentage)</th>
<th>Material Location</th>
<th>Waste Category</th>
<th>Estimated Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar &amp; Gravel Roofing Field (60%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>Class II</td>
<td>Category I Non-Friable</td>
<td>600 sf</td>
</tr>
<tr>
<td>Roof Curb (65%)</td>
<td>East Equipment Roof (lower roof)</td>
<td>Class II</td>
<td>Category I Non-Friable</td>
<td>Quantity Included Above</td>
</tr>
</tbody>
</table>

*Estimated quantities* are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey.

**% & Type Asbestos** = this column contains both the analytical result of the sample with the highest concentration of asbestos detected in the samples that make up the HA and the types of asbestos identified.

The materials listed in this table have been sampled and determined to contain asbestos in concentrations greater than 1%. When disturbed, various federal, state and local regulations may apply. These materials should be monitored for damage over time and repaired as necessary by appropriately trained personnel. Removal may be necessary before renovations and in most cases before a demolition. See Appendix B for a summary of samples collected. See Appendix C for a copy of the asbestos analytical report. See Appendix E for sample location diagrams.

sf = square feet
APPENDIX B

ASBESTOS SURVEY SAMPLE LOCATION SUMMARY
# APPENDIX B

**Gymnasium Roof**  
Los Medanos College  
2700 East Leland Road, Pittsburg, California

## ASBESTOS SURVEY SAMPLE LOCATION SUMMARY

<table>
<thead>
<tr>
<th>HA No.</th>
<th>Sample Number</th>
<th>Material Description</th>
<th>Sample Location</th>
<th>Lab Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>GYMNASIUM ROOF (upper roof)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>001</td>
<td>1A</td>
<td>Walking Pads</td>
<td>West side of east equipment</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>1B</td>
<td></td>
<td>East side of west equipment</td>
<td></td>
</tr>
<tr>
<td>002</td>
<td>2A</td>
<td>Rolled Roofing Field</td>
<td>Near center</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>2B</td>
<td></td>
<td>Southwest corner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2C</td>
<td></td>
<td>Northeast corner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2D</td>
<td></td>
<td>South edge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2E</td>
<td></td>
<td>North edge</td>
<td></td>
</tr>
<tr>
<td>003</td>
<td>3A</td>
<td>Roof Insulation Board (under HA 002)</td>
<td>Near center</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>3B</td>
<td></td>
<td>Southwest corner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3C</td>
<td></td>
<td>Northeast corner</td>
<td></td>
</tr>
<tr>
<td>004</td>
<td>4A</td>
<td>Roofing at Curbs</td>
<td>West HVAC – west side</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>4B</td>
<td></td>
<td>East HVAC – south side</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4C</td>
<td></td>
<td>East HVAC – West side</td>
<td></td>
</tr>
<tr>
<td>005</td>
<td>5A</td>
<td>Roof Mastic</td>
<td>East HVAC curb</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>5B</td>
<td></td>
<td>Penetration – north side</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5C</td>
<td></td>
<td>Northwest corner – West HVAC platform</td>
<td></td>
</tr>
<tr>
<td>006</td>
<td>6A</td>
<td>Coating at HVAC Platforms</td>
<td>East HVAC platform – SE corner</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>6B</td>
<td></td>
<td>East HVAC platform – NW corner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6C</td>
<td></td>
<td>West HVAC platform – west side</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>EAST EQUIPMENT ROOF (lower roof)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>007</td>
<td>7A</td>
<td>Tar &amp; Gravel Roofing Field</td>
<td>North end</td>
<td>60% Chrysotile</td>
</tr>
<tr>
<td></td>
<td>7B</td>
<td></td>
<td>South end</td>
<td></td>
</tr>
<tr>
<td>008</td>
<td>8A</td>
<td>Roof Curb</td>
<td>East edge near center</td>
<td>65% Chrysotile</td>
</tr>
<tr>
<td></td>
<td>8B</td>
<td></td>
<td>West edge at gym building</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8C</td>
<td></td>
<td>South end at roof hatch</td>
<td></td>
</tr>
<tr>
<td>009</td>
<td>9A</td>
<td>Roof Insulation (under HA 007)</td>
<td>North end</td>
<td>None Detected</td>
</tr>
<tr>
<td></td>
<td>9B</td>
<td></td>
<td>South end</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

ASBESTOS ANALYTICAL LABORATORY DATA
Report for:

Mr. Kenneth Pilgrim, Mr. Steffen Steiner  
RGA Environmental, Inc.  
1466 66th Street  
Emeryville, CA  94608

Regarding:  
Project: R1167F96; Los Medanos College, Gym Roof  
EML ID: 1669357

Approved by:  
Renee Luna

Dates of Analysis:  
Asbestos PLM: 02-02-2017

Service SOPs: Asbestos PLM (EPA Methods 600/R-93/116 & 600/M4-82-020, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the items tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.
Client: RGA Environmental, Inc.  Date of Sampling: 01-30-2017  
C/O: Mr. Kenneth Pilgrim, Mr. Steffen Steiner  Date of Receipt: 01-31-2017  
Re: R1167F96; Los Medanos College, Gym Roof  Date of Report: 02-02-2017

ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

<table>
<thead>
<tr>
<th>Location: 1A, Walking pads, West side of E equipment</th>
<th>Lab ID-Version‡: 7777938-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Layers</td>
<td>Asbestos Content</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt with Multicolored Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Composite Non-Asbestos Content:</strong> 10% Glass Fibers</td>
<td></td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong> Poor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 1B, Walking pads, East side of W equipment</th>
<th>Lab ID-Version‡: 7777939-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Layers</td>
<td>Asbestos Content</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt with Multicolored Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Composite Non-Asbestos Content:</strong> 10% Glass Fibers</td>
<td></td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong> Poor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 2A, Rolled roofing field, gym roof, near center</th>
<th>Lab ID-Version‡: 7777940-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Layers</td>
<td>Asbestos Content</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Composite Non-Asbestos Content:</strong> 15% Glass Fibers</td>
<td></td>
</tr>
<tr>
<td>7% Cellulose</td>
<td></td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong> Poor</td>
<td></td>
</tr>
</tbody>
</table>

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Client: RGA Environmental, Inc.  
C/O: Mr. Kenneth Pilgrim, Mr. Steffen Steiner  
Re: R1167F96; Los Medanos College, Gym Roof  

Date of Sampling: 01-30-2017  
Date of Receipt: 01-31-2017  
Date of Report: 02-02-2017  

**ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116**

**Location:** 2B, Rolled roofing field, gym roof, SW corner

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Tar and Felt with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:**  
- 15% Glass Fibers  
- 5% Cellulose

**Sample Composite Homogeneity:** Poor

---

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**ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116**

**Location: 2C, Rolled roofing field, gym roof, NE corner**

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Tar and Felt with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>15% Glass Fibers</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Poor</td>
</tr>
<tr>
<td></td>
<td>5% Cellulose</td>
</tr>
</tbody>
</table>

**Location: 3A, Roof insulation board under HM002, gym roof, near center**

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>85% Cellulose</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Good</td>
</tr>
</tbody>
</table>

**Location: 3B, Roof insulation board under HM002, gym roof, SW corner**

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>85% Cellulose</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Good</td>
</tr>
</tbody>
</table>

**Location: 3C, Roof insulation board under HM002, gym roof, NE corner**

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>85% Cellulose</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Good</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Location: 2D, Rolled roofing field cont., gym roof, at S edge</th>
<th>Lab ID-Version: 7777946-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Black Roofing Shingle with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>20% Glass Fibers</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Poor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 2E, Rolled roofing field cont., gym roof, at N edge</th>
<th>Lab ID-Version: 7777947-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Black Roofing Shingle with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>25% Glass Fibers</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Poor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 4A, Roofing, at curbs, W HVAC, West side</th>
<th>Lab ID-Version: 7777948-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Black Roofing Shingle with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Shingle with Gray Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Composite Non-Asbestos Content:</td>
<td>20% Glass Fibers</td>
</tr>
<tr>
<td>Sample Composite Homogeneity:</td>
<td>Poor</td>
</tr>
</tbody>
</table>

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Client: RGA Environmental, Inc.  Date of Sampling: 01-30-2017
C/O: Mr. Kenneth Pilgrim, Mr. Steffen Steiner  Date of Receipt: 01-31-2017
Re: R1167F96; Los Medanos College, Gym Roof  Date of Report: 02-02-2017

**ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116**

**Location:** 4B, Roofing, at curbs, E HVAC, South side

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Shingle with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt with Gray Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:**
- 20% Glass Fibers
- < 1% Cellulose

**Sample Composite Homogeneity:** Poor

---

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## ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

### Location: 4C, Roofing, at curbs, E HVAC, West side

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Shingle with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt with Gray Pebbles</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 20% Glass Fibers 7% Cellulose

**Sample Composite Homogeneity:** Poor

### Location: 5A, Roof mastic, East HVAC curb

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray/Black Roofing Mastic with White Pebbles</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 10% Cellulose

**Sample Composite Homogeneity:** Good

### Location: 5B, Roof mastic, penetration, N side

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray/Black Roofing Mastic with White Pebbles</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 10% Cellulose

**Sample Composite Homogeneity:** Good

### Location: 5C, Roof mastic, NW corner, W HVAC platform

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray/Black Roofing Mastic with White Pebbles</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar and Felt</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 10% Cellulose 5% Glass Fibers

**Sample Composite Homogeneity:** Poor

---

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---

EMLab ID: 1669357, Page 7 of 10
Client: RGA Environmental, Inc.
C/O: Mr. Kenneth Pilgrim, Mr. Steffen Steiner
Re: R1167F96; Los Medanos College, Gym Roof

Date of Sampling: 01-30-2017  Date of Receipt: 01-31-2017  Date of Report: 02-02-2017

ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

<table>
<thead>
<tr>
<th>Location: 6A, Coating, at HVAC platforms, East HVAC platform, SE corner</th>
<th>Lab ID-Version‡: 7777954-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Gray Coating</td>
<td>ND</td>
</tr>
<tr>
<td>Gray Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Gray Cementitious Material</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Composite Non-Asbestos Content:</strong></td>
<td>3% Glass Fibers</td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong></td>
<td>Poor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 6B, Coating, at HVAC platforms, East HVAC platform, NW corner</th>
<th>Lab ID-Version‡: 7777955-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Gray Coating</td>
<td>ND</td>
</tr>
<tr>
<td>Gray Cementitious Material</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong></td>
<td>Moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location: 6C, Coating, at HVAC platforms, West HVAC platform, W Side</th>
<th>Lab ID-Version‡: 7777956-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Layers</strong></td>
<td><strong>Asbestos Content</strong></td>
</tr>
<tr>
<td>Gray Coating</td>
<td>ND</td>
</tr>
<tr>
<td>Gray Cementitious Material</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Sample Composite Homogeneity:</strong></td>
<td>Moderate</td>
</tr>
</tbody>
</table>

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**ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116**

**Location:** 7A, Tar and gravel roofing field, E equipment roof, North end  

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Roofing Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>60% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>60% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>50% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>50% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>50% Chrysotile</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 10% Cellulose  

**Sample Composite Homogeneity:** Poor
### Location: 8A, Roof curb, E equipment roof, East edge, near center

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Material (Coating)</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Felt</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Dark Brown Roofing Felt</td>
<td>65% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Dark Brown Roofing Felt</td>
<td>65% Chrysotile</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Dark Brown Roofing Felt</td>
<td>65% Chrysotile</td>
</tr>
<tr>
<td>Brown Fibrous Material</td>
<td>ND</td>
</tr>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:**
- 8% Cellulose
- 4% Glass Fibers
- 3% Synthetic Fibers

**Sample Composite Homogeneity:** Poor

### Location: 9A, Roof insulation, under HM 007, North end

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Insulation</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 75% Cellulose

**Sample Composite Homogeneity:** Moderate

### Location: 9B, Roof insulation, under HM 007, South end

<table>
<thead>
<tr>
<th>Sample Layers</th>
<th>Asbestos Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Roofing Tar</td>
<td>ND</td>
</tr>
<tr>
<td>Brown Insulation</td>
<td>ND</td>
</tr>
</tbody>
</table>

**Composite Non-Asbestos Content:** 75% Cellulose

**Sample Composite Homogeneity:** Moderate

---

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Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
**Project Name/Address/Building No.:** Los Medanos College - Gym Roof

**Sample(s) sent to:**
- MAL
- AERO
- IRLAB
- Other

**Sample ID**

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Material Description</th>
<th>Sample Location &amp; Material Location</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A9</td>
<td>Walking Pads</td>
<td>East side of E equivalent</td>
<td></td>
</tr>
<tr>
<td>A91B</td>
<td></td>
<td>East side of N equivalent</td>
<td></td>
</tr>
<tr>
<td>A02</td>
<td>Rolled Roofing Field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2A</td>
<td>Gym Roof - Near center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2B</td>
<td>Gym Roof - SW corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2C</td>
<td>Gym Roof - NE corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B03</td>
<td>Roofing Insulation Board under HM 007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td>Gym Roof - Near center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3B</td>
<td>Gym Roof - SW corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C</td>
<td>Gym Roof - NE corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G02</td>
<td>Rolled Roofing Field Cond.</td>
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<td></td>
</tr>
<tr>
<td>2D</td>
<td>Gym Roof @ W edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2E</td>
<td>Gym Roof @ N edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B04</td>
<td>Roofing @ Curbs</td>
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</tr>
<tr>
<td>4A</td>
<td>W HVAC - West side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4B</td>
<td>E HVAC - South side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4C</td>
<td>E HVAC - West side</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Relinquished By:**
- Signature: [Signature]
- Date/Time: 11/30/2017 15:55

**Received By:**
- Signature: [Signature]
- Date/Time: 11/30/2017 15:55

**Relinquished By:**
- Signature: [Signature]
- Date/Time: 11/30/2017 15:55

**Received By:**
- Signature: [Signature]
- Date/Time: 11/30/2017 15:55

1466 65th Street Pinole CA 94564 Tel: (510) 547-7771 Fax: (510) 547-1983
## ACM BULK SAMPLE DATA SHEET

### Project Name/Address/Building No.
Los Medanos College - Gym Roof

### Project #
K167790

### Sample(s) sent to:
- [ ] Mail
- [x] EM Labs
- [ ] Other

### TAT
- [ ] Rush
- [ ] 24 hrs
- [ ] 48 hrs
- [ ] 3-5 days

### Sample #

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Location &amp; Material Location</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA</td>
<td>East HVAC Cab</td>
<td></td>
</tr>
<tr>
<td>EB</td>
<td>Pedestrian - N side</td>
<td></td>
</tr>
<tr>
<td>EC</td>
<td>NW Corn - W HVAC Platform</td>
<td></td>
</tr>
<tr>
<td>EA</td>
<td>East HVAC Platform - SE corner</td>
<td></td>
</tr>
<tr>
<td>EB</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>EC</td>
<td>West HVAC Platform - W side</td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>North End</td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td>South End</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>East edge - new color</td>
<td></td>
</tr>
<tr>
<td>SB</td>
<td>West edge @ Gym Bldg</td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>S South end @ roof hotel</td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>North end</td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td>South end</td>
<td></td>
</tr>
</tbody>
</table>

### Excluded Material:
- Roofing Insulation under HM 003

---

**Relinquished By:**

Kenneth Filpin

**Signature:**

Date/Time: 11/3/2017, 15:55

**Received By:**

H Morrisey

**Signature:**

Date/Time: 11/3/2017, 15:55

---

1460 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983
APPENDIX D

LICENSES AND CERTIFICATIONS
State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Kenneth McRae Pilgrim
Name
Certification No. 03-3503
Expires on 12/17/17

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7360 and 7362 of the Business and Professions Code.
State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Steffen Paul Steiner
Name
Certification No. 92-0850
Expires on 01/08/16

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.
APPENDIX E

SAMPLE LOCATION DRAWINGS