ASBESTOS ABATEMENT SPECIFICATION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 Scope of Work: The "Work" specified herein includes removal and disposal of all asbestos-containing construction materials (ACCMs) to facilitate the roofing renovation project for the Administration and Dormitory Buildings located at Camp Wilmont Sweeney, 2600 Fairmont Drive in San Leandro, California. The Asbestos Abatement Contractor (Contractor) will supply all labor, supervision, materials, equipment, tools, services, insurance and each and every item of expense necessary to perform and complete the Work. Work must be performed as specified herein and in compliance with applicable federal, state and local regulations.

A hazardous materials survey has been performed by Terracon Consultants, Inc. of Emeryville, California and is attached to this specification. Based on this information, the Contractor's work includes removal and disposal of the following ACCMs:

Administration Building:

- Asphalt sheet roofing applied over the main roof contains 1-5% Chrysotile asbestos (approx. 4,425 square feet);
- Gray roofing patch applied over the main roof contains 1-5% Chrysotile asbestos (approx. 25 square feet); and
- Black roofing patch applied over the main roof contains 1-5% Chrysotile asbestos (approx. 50 square feet).

Dormitory Building:

- Gray mastic/caulking applied over the skylight metal frames contains 1-5% Chrysotile asbestos (approx. 400 linear feet or 33 square feet).

It is the responsibility of the Contractor to field verify asbestos locations and quantities prior to bid submission.

1.1.2 Project IH Consultant: The County's Industrial Hygiene Consultant (hereinafter referred to as the "Project IH Consultant") will provide independent, third-party industrial hygiene consulting services on behalf of the County. Such services may or may not include conducting on-site work observations, materials or environmental testing, and/or consulting with the County. It is not the responsibility of the Project IH Consultant to supervise the Contractor; nor to direct the Contractor's work effort; nor to assume the management of, or responsibility for, the Contractor's health and/or safety practices, nor its waste management, nor its regulatory compliance. At all times, the Contractor shall be solely responsible for the quality and execution of all phases and aspects of the Work.

1.2 SUBMITTALS

1.2.1 General:

1.2.1.1 In addition to any other contractual submittals required of the Contractor, the Contractor will provide to the County the submittals described in this Specification section. Submittals will be reviewed by both the County and the Project IH

Consultant for acceptability. The Project IH Consultant will either recommend submittals to the County for acceptance, or will return them to the County as deficient, with notations for correction and re-submission. The Project IH Consultant does not have authority to "approve" submittals.

1.2.1.2 Documents submitted by the Contractor in an effort to comply with the requirements of this Specification section are to be separate and distinct from any other submittals provided to comply with other Specification sections. In attempting to satisfy the requirements of this Specification section, the Contractor must submit only those documents specifically requested to fulfill the specified requirements. Extraneous documentation will be rejected, but not returned.

1.2.2 Schedule and Format:

1.2.2.1 Delivery: Submittals listed in this section must be delivered to the County.

1.2.2.2 Quantity: Two (2) identical, legible copies of each submittal listed in this section shall be delivered in an organized fashion suitable to the County for review. One (1) copy will be conveyed by the County to the Project IH Consultant for review.

1.2.2.3 Work Commencement: No portion of the Work shall be commenced by the Contractor until the submittals are reviewed and accepted by the County.

1.2.2.4 Delays: Delays to the Work resulting from the submittal of deficient or illegible documentation, or from the untimely submittal of potentially acceptable documentation, shall be the sole responsibility of the Contractor. Except as otherwise granted by the County, no extensions will be made to the awarded contract schedule or budget to accommodate such delays.

1.2.2.5 Format: Submittals will be provided in 8-1/2" x 11" format with sections separated by numbered tabs indexed to a printed Table of Contents. Illegible submittals will be considered deficient and returned for correction.

1.2.2.6 Schedule: Submittals delivered to the County will observe and conform with the following timetable:

1.2.2.6.1 Pre-work Submittals – Not less than ten (10) business days prior to the Contractor's mobilization onto the work site, the Contractor shall deliver legible copies of the specified documents. The Project IH Consultant will review submittals and return deficient submittals to the County within five (5) business days following their receipt by the Project IH Consultant. Deficient submittals will be corrected and resubmitted by the Contractor within five (5) business days of their return. Once accepted, the reviewed copy shall be returned to the Contractor, who shall maintain a copy of the accepted submittal at the work site.

1.2.2.6.2 Product Submittals – Not less than ten (10) business days prior to the date of intended use of the product on the work site.

1.2.2.6.3 Post-work Submittals – Except as otherwise specified herein, the Contractor shall, within twenty (20) business days following demobilization from the project site, submit two (2) copies of the Post-work Submittals listed in this section. If the Project IH Consultant or the

County determines that the Post-work Submittals are unacceptable, the Contractor will be required to correct the deficiencies and re-submit them for review.

1.2.3 Pre-Work Submittals:

1.2.3.1 Progress Schedule: Provide a proposed work schedule indicating the listed items.

1.2.3.1.1 Show the complete sequence of the asbestos work plan by activity and the sequencing of work for each regulated work area.

1.2.3.1.2 Show the dates for the beginning and completion of each major element (work area set-ups, gross removal, detail cleaning, preliminary visual inspections, final visual inspections, tear-down, etc.) of the abatement work, including substantial completion dates for each building, on each floor, and for each regulated work area. Update as necessary.

1.2.3.1.3 Provide anticipated manpower distribution per scheduled activity and regulated work area. Distinguish between trained full-time personnel and unskilled or temporary labor. Indicate whether or not any subcontracted labor will be utilized.

1.2.3.1.4 Provide anticipated number of shifts per day and days per week, as well as specific hours for each shift. Indicate any anticipated overtime, weekend work shifts, night shifts or holiday work shifts planned. Unless otherwise directed, plan to conduct all abatement activities during routine business hours (M-F, 7:00 a.m. to 5:00 p.m.).

1.2.3.1.5 At a minimum, the Contractor's Progress Schedule is to be formulated on a three-week, "look ahead" basis and updated weekly.

1.2.3.1.6 All requests for deviations from, or changes to, the initially established daily work shift hours and/or the weekly work days shall be submitted in writing to the County and the Project IH Consultant for approval not less than 3 business days prior to the anticipated implementation of said changes. This requirement will also apply to remobilizations following periods of inactivity by the Contractor. The Contractor shall not implement any work schedule changes without the prior expressed approval of the County. The Contractor shall be responsible for its Subcontractors' compliance with these requirements.

1.2.3.2 Notifications/Permits/Licenses:

1.2.3.2.1 Written proof that all required permits, licenses, and registrations have been applied for and received, or are pending approval. This shall include, but not necessarily be limited to, Contractor State Licensing Board (CSLB) Licenses, California Division of Occupational Safety and Health (DOSH) registrations, and/or as otherwise required by any federal, state, or local governments or regulatory agencies.

1.2.3.3 Worker Documentation:

1.2.3.3.1 Name and social security number of each employee to be engaged in asbestos related work.

1.2.3.3.2 Current valid documentation from a Cal/OSHA-approved training provider indicating the most recent asbestos abatement training course and training date that each person listed in Paragraph 1.2.3.3.1. (above) has attended. Legible photocopies of recent (within the preceding 12 months) training certification cards (Laborer's Trust Cards) will suffice, as long as both sides of the card are provided.

1.2.3.3.3 Name and social security number of the Asbestos Project Superintendent. Provide current valid documentation from a Cal/OSHA-approved training provider indicating the most recent asbestos abatement contractor/supervisor training course and training date that he/she has attended. Provide evidence indicating that he/she has a minimum of one year on-the-job experience as an Asbestos Project Superintendent.

1.2.3.3.4 Current valid documentation indicating each worker's most recent respiratory protection training and respirator fit testing. Respirator fit testing documentation must contain all information required in 8 CCR §5144 (m)(2).

1.2.3.3.5 Current valid medical documentation indicating each worker's most recent asbestos medical examination. Each such medical document must be signed by a licensed physician to be acceptable. Illegible or incomplete photocopies, or preliminary examination reports, will be rejected as deficient.

1.2.3.3.6 Current valid medical documentation indicating each worker's medical fitness to wear a tight-fitting respirator and noting any medical limitations to such respirator usage. Each such medical determination must be signed by a licensed physician to be acceptable. Illegible or incomplete photocopies, or preliminary examination reports, will be rejected as deficient.

1.2.3.3.7 Submit a completed Certificate of Asbestos Worker's Acknowledgment form (Attachment A to this Specification section) for each worker engaged in asbestos-related work. Contractor's employees will not be allowed to engage in asbestos-related work prior to submitting a completed Certificate of Asbestos Worker's Acknowledgment form.

1.2.3.3.8 Submit a completed Certificate of Competent Person Acknowledgment form (Attachment B to this Specification section) for each employee engaged in asbestos-related supervisory work. Abatement Contractor's Competent Person will not be allowed to engage in asbestos-related supervisory work prior to submitting a completed Certificate of Certificate of Competent Person Acknowledgment form.

1.2.3.4 Subcontractors: Submit qualifications and 24-hour contact information for each subcontractor to be used. This shall include two (2) legible copies of federal, state, and/or local business or operating permits, as well as State and/or EPA identification numbers for the waste transporters and disposal facilities to be used.

1.2.3.5 Abatement Work Plan: Submit a detailed work plan indicating the practices and procedures proposed for use in complying with the requirements of this specification. Include in the plan schematic drawings with depictions of the locations and general configurations of all regulated work areas. Mark-ups of current project plans will suffice to satisfy this requirement. For each regulated work area, indicate the planned locations of personal decontamination units, equipment decontamination and waste load-out chambers, exhaust air filtration units, air exhaust locations, temporary utilities locations, work area view ports and any other elements or conditions of significance to the controlled completion of the Work (e.g., location of sanitary or storm drains that will require protection). The text of the Work Plan should address the sequencing of the asbestos work; the interface of any skilled trades involved in the performance of the Work; the methods to be used to assure the safety of site workers and visitors to the site; a disposal plan including the on-site location(s) of secured waste storage areas; and a detailed description of the methods to be employed to prevent environmental impairment of the work site and its surrounding area. Expand upon the use of methods of removal to prohibit visible emissions from within the work areas, and for the packaging and transport of removed asbestos waste or debris. The plan must be reviewed and accepted by the Project IH Consultant prior to the commencement of work.

1.2.3.6 Contingency Plan: Submit a contingency plan for emergencies including, but not necessarily limited to: fire, accidents, medical emergencies, power failures, differential air pressure ("negative air") system failures, or any other event that may require modification of decontamination methods or work area isolation procedures. Include in the plan specific procedures for work area isolation and/or decontamination. **Note**: Nothing in this specification should be interpreted as instructions to impede the rapid and safe exiting from the work area(s), nor to impede the provision of adequate medical attention in the event of an emergency.

> **Post**: In a room immediately adjacent to the Personnel Decontamination Unit(s), prominently display telephone numbers, locations of and driving instructions to, emergency services including, but not necessarily limited to: fire, ambulance, physician, hospital, police, power company, telephone company, and Contractor's job-site Superintendent.

1.2.3.7 Field Logs: Submit a sample of Daily Field Logs, Work Area Entry/Exit Logs, etc. to be used during the asbestos abatement work.

1.2.3.8 Rental Equipment: If rental equipment is to be used in conjunction with this asbestos abatement work, a written notification is to be provided to the rental company informing the company that the rented equipment will be used on an asbestos abatement project. A copy of that written notification will be submitted to the Project IH Consultant. The notification must state how the rented equipment is to be used, how it will be decontaminated following its use, and include a space for the acknowledgement of the rental company that it has been advised of the rented equipment's intended use. The Contractor will obtain written acknowledgment from an authorized representative of the rental company and will return an original signed copy of the acknowledgment to the Project IH Consultant as documentation of compliance with this requirement. In the absence of such rentals, the Contractor will submit a signed declaration on the Contractor's letterhead and signed by an

authorized representative of the Contractor stating that no rented equipment will be used by the Contractor on this project.

1.2.3.9 Safety Data Sheets: Submit current Safety Data Sheets for each potentially hazardous material to be used on the job-site. Refer to above Section 1.2.2.6.2 – Product Submittals.

1.2.3.10 California D.O.S.H. Registration: Submit evidence of the Contractor's registration with the Division of Occupational Safety and Health (Cal-OSHA) to conduct asbestos-related construction work, in accordance with 8 CCR §341.6.

1.2.3.11 Waste Hauling Qualifications: Submit proof of hazardous waste transporter's registration and the vehicle operator training. Submittals shall include, but not necessarily be limited to: business name, address (mailing address and physical location), and business telephone number of the company; primary contact name and emergency contact (24-hour) telephone number; documentation of current State and/or EPA authorization to operate; and insurance coverage.

1.2.3.12 Waste Disposal Facility Qualifications: Submit documentation of the California State and/or EPA-approved waste disposal facility chosen to receive shipments of asbestos-containing waste generated during this Project. Such information will include, but not necessarily be limited to: business name, address (mailing address and physical location), and business telephone number of the facility; primary contact name and emergency contact (24-hour) telephone number; documentation of current State and/or EPA authorization to operate; operator's facility I. D. number; classification and/or types of waste(s) accepted; name, business address and telephone number of insurance provider; documentation of insurance type(s), coverage amounts, and any limitations on liability; and any regulatory agency information pertaining to known citations issued, notices of violations issued, corrective actions ordered, Records of Decisions rendered, or on-going environmental investigations or known liabilities.

1.2.4 POST-WORK SUBMITTALS:

1.2.4.1 General: In accordance with the requirements of the above Section 1.2.2.6.3 -Post-Work Submittals, submit the following documentation:

1.2.4.1.1 Copies of employee and visitor Work Area Entry/Exit Logs and Daily Field Logs/Reports.

1.2.4.1.2 Waste manifests, weight tickets, and landfill receipts.

1.2.4.1.3 Results of all Contractor's personal exposure air monitoring.

1.2.4.1.4 Manometer print-outs attached to 8-1/2" x 11" paper. Each page should indicate the dates, times, and work area containment to which the Manometer print-out applies. Print-out pages should be arranged in ascending chronological order.

1.2.4.1.5 Incident reports describing any events such as injuries, accidents, emergencies, or loss of differential air pressure and the actions taken in response.

1.3 QUALITY REQUIREMENTS

1.3.1 Reference Standards:

1.3.1.1 Regulations: Applicable regulations pertaining to this asbestos abatement work include, but are not necessarily limited to, the following:

1.3.1.1.1 Bay Area Air Quality Management District (BAAQMD) - Regulation 11 Hazardous Pollutants Rule 2, dated October 7, 1998 or more recent.

1.3.1.1.2 California Division of Occupational Safety and Health (Cal-OSHA) – Construction Safety Orders - Asbestos, Title 8, California Code of Regulations section 1529, et. seq. (8 CCR §1529).

1.3.1.1.3 California Health and Safety Code Section 25163, et. seq. (Transportation of Hazardous Waste).

1.3.1.1.4 Title 22, California Code of Regulations, Section 66261.24 et. seq. (Characteristics of Hazardous Waste – Toxicity).

1.3.1.1.5 Title 22, California Code of Regulations, Section 66268.7(a)(11).

1.3.1.1.6 Title 22, California Code of Regulations, Section 66268.114 et. seq. (Treatment Standard for Asbestos-Containing Waste).

1.3.1.1.7 California Labor Code sections 6501.5 (Employer Registration); and 6501.9 (Determining the Presence of Asbestos Prior to Contracting for Work).

1.3.1.1.8 California Safe Drinking Water and Toxic Enforcement Act of 1986 (Prop. 65).

1.3.1.1.9 Title 29, Code of Federal Regulations, Parts 1910 and 1926.1101.

1.3.1.1.10 Title 40, Code of Federal Regulations, Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP). U.S. Environmental Protection Agency (U.S. EPA).

1.3.1.1.11 Title 49, Code of Federal Regulations, Part 172, U.S. Department of Transportation.

1.3.1.1.12 All other applicable Federal, State, and/or Local regulations, codes, and ordinances.

1.3.1.2 Standards: Applicable industry standards pertaining to asbestos abatement work include, but are not limited to, the following:

1.3.1.2.1 American National Standard Institute (ANSI) Publications:

Z9.2 Fundamentals Governing The Design and Operation of Local Exhaust Systems; and

Z88.2 Practices for Respiratory Protection.

1.3.1.2.2 U. S. Environmental Protection Agency (EPA): Publication No. 560/5-85-024 Guidance for Controlling Asbestos-Containing Materials in Buildings, June, 1985

1.3.1.2.3 American Society for Testing Materials (ASTM) Publications:

E1368-05e1 Standard Practice for Visual Inspection of Asbestos Abatement Projects; and

E1542-93 (2004) Standard Terminology Relating to Occupational Health and Safety.

1.3.1.2.4 National Institute of Occupational Safety and Health (NIOSH) Publications:

Manual of Analytical Methods:

Method 7400 Asbestos and Other Fibers by PCM; and

Method 7402 Asbestos Fibers by TEM.

1.3.1.2.5 Underwriters Laboratories, Inc. (UL) Publication:

UL 586 High Efficiency, Particulate, Air Filter Units

1.3.1.3 Applicability. The most current version of each document will apply. Where conflicts among these regulations or standards exist, the more stringent requirement or interpretation will apply.

1.3.2 Definitions: In addition to definitions provided elsewhere in these specifications, the following definitions shall apply:

1.3.2.1 **Abatement:** The procedure to control fiber release from asbestos-containing building materials. Activities include removal, encapsulation, and enclosure.

1.3.2.2 **Adequately Wet:** A term defined in 40 CFR 61, Subpart M and EPA 340/1-90-019 that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed to be coming from ACM or ACCM, then that material has not been adequately wetted. The absence of visible emissions, however, is not sufficient evidence of being adequately wetted.

1.3.2.3 **Aggressive Clearance:** Final clearance air monitoring of a regulated asbestos work area which utilizes leaf blowers, fans, and similar tools to "aggressively" disturb and entrain any settled residual asbestos fibers for the purpose of capturing them during sampling.

1.3.2.4 **Air Lock:** A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area.

1.3.2.5 **Air Monitoring:** The process of measuring the fiber content of a specific volume of air in a stated period of time.

1.3.2.6 **Amended Water:** Water to which a surfactant has been added.

1.3.2.7 **Asbestos:** The general name given to a group of fibrous mineral forms including chrysotile, crocidolite, amosite, tremolite anthophyllite, and actinolite and any of these minerals that have been chemically treated or altered.

1.3.2.8 **Asbestos-Containing Hazardous Waste:** Any material that contains more than one percent asbestos and is in a friable, finely divided, or powered state. Alternatively, any mixture of material(s) which contains (i.e. is contaminated with) equal to, or greater than, one percent friable asbestos is also asbestos-containing hazardous waste.

1.3.2.9 **Asbestos-Containing Material:** any material containing more than one percent (1%) asbestos.

1.3.2.10 **Asbestos-Containing Construction Material:** any manufactured construction material which contains more than one tenth of 1 percent (0.1%) asbestos by weight.

1.3.2.11 **Asbestos Abatement Contractor:** The contractor or subcontractor designated in the contract documents as being responsible to the County for the control or abatement of asbestos-containing or asbestos-contaminated materials.

1.3.2.12 **Asbestos Permissible Exposure Limit (PEL):** The Contractor will assure that no employee is exposed to an airborne concentration of asbestos of greater than 0.1 fibers per cubic centimeter (f/cc) as based on an 8-hour time-weighted average (TWA).

1.3.2.13 **Authorized Visitor:** The County or designated representative, the Project IH Consultant, the Project IH Consultant's inspector or representative, or any representative of a federal, state, county, city, or local agency having legal or regulatory jurisdiction over the project while acting in an official capacity. Any person whose name appears upon an approved authorized visitor's list.

1.3.2.14 **Background Monitoring:** See "Prevalent Level Monitoring."

1.3.2.15 **Class I Asbestos Work:** Activities involving the removal of thermal system insulation (TSI) and surfacing ACM or PACM. For the purposes of this specification, asbestos-containing resilient sheet flooring ("linoleum") will also be removed as "Class I Asbestos Work."

1.3.2.16 **Class II Asbestos Work:** Activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard or joint compound, floor tile, roofing materials, sidings and construction mastics.

1.3.2.17 **Clean Room:** An uncontaminated area or room which is part of the worker decontamination enclosure with provisions for storage of worker's street clothes and protective equipment.

1.3.2.18 **Competent Person:** In addition to the definition in 29 CFR §1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take

prompt corrective measures to eliminate them, as specified in 29 CFR §1926.32 (f): in addition, for Class I and Class II work, one who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR §763) for supervisor, or its equivalent and, for Class III and Class IV work, one who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR §763.92 (a)(2).

1.3.2.19 **County:** The County of Alameda and its designated representative(s).

1.3.2.20 **Critical Barrier:** One or more layers of plastic sealed over an opening into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

1.3.2.21 **Curtained Doorway:** A device to allow ingress and egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway.

1.3.2.22 **Decontamination Enclosure System:** A series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers and of materials and equipment. A decontamination enclosure system always contains at least one airlock.

1.3.2.23 **Differential Air Pressure Equipment:** A portable local exhaust fan or "unit" equipped with HEPA filtration and capable of maintaining a constant, negative air pressure differential within the regulated work area by providing a low velocity air flow into contaminated areas from adjacent uncontaminated areas and exhausting filtered air outside the work area (preferably to the outdoor air).

1.3.2.24 **Disturbance:** Activities that disrupt the matrix of ACM/ACCM or PACM, crumble or pulverize ACM/ACCM or PACM, or generate visible debris from ACM/ACCM or PACM. This term includes activities that disrupt the matrix of ACM/ACCM or PACM, render ACM/ACCM or PACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM/ACCM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM/ACCM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

1.3.2.25 **DOP Testing:** The challenge testing of HEPA-filtered equipment, using appropriate aerosols. A 0.3 μm dioctylphthalate aerosol was formerly used in challenging the efficiency of HEPA-filtered equipment. Although dioctylphthalate compounds are now suspected human carcinogens, the phrase "DOP testing" is still current vernacular for the process of challenge testing the efficiency of HEPA-filtered equipment.

1.3.2.26 **Encapsulant:** A liquid material which can be applied to asbestos-containing materials and which prevents the possible release of asbestos fibers from the material either by

creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A sealant.

1.3.2.27 **Encapsulation:** All herein specified procedures necessary to apply an encapsulant to asbestos-containing building materials to control the possible release of asbestos fibers into the air.

1.3.2.28 **Enclosure:** All herein specified procedures necessary to completely enclose asbestos-containing material behind airtight, impermeable, permanent barriers.

1.3.2.29 **Equipment Decontamination Enclosure:** That portion of a decontamination enclosure system designed for controlled transfer of materials and equipment, typically consisting of a washroom and a holding area.

1.3.2.30 **Equipment Room:** A contaminated area or room which is part of the worker decontamination enclosure with provisions for storage of contaminated clothing and equipment.

1.3.2.31 **Excursion Limit:** The Contractor will assure that no employee is exposed to an airborne concentration of asbestos of greater than 1.0 fiber per cubic centimeters (f/cc) as an average over a sampling period of thirty minutes.

1.3.2.32 **Fixed Object:** A unit of equipment or furniture in the work area which cannot be removed from the work area.

1.3.2.33 **Friable:** Material(s) that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Material that has been rendered to a finely divided or powered state will also be considered to be “friable.”

1.3.2.34 **Glovebag:** Not more than a 60-inch x 60-inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

1.3.2.35 **Glovebag Technique**: A method with limited applications for removing small amounts of friable asbestos-containing material from HVAC ducts, short pipe runs, valves, joints, elbows, and other non-planer surfaces in an otherwise non-enclosed work area. The glovebag assembly is a manufactured or pre-fabricated device consisting of a glovebag (typically constructed of 6-mil transparent regulate plastic), two inward projecting long sleeve rubber gloves, one inward projecting sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and should be installed in such a manner that it will surround the ACCM or ACM to be removed and will contain all asbestos fibers released during the removal process. All workers who are permitted to use the glovebag technique must be trained, experienced, and skilled in this method. Limitations on, and requirements pertaining to glovebag work, as set forth in 8 CCR §1529 et. seq., will be observed and complied with during this Work. The number of contiguous glove-bags that may be used within a regulated work area will be at the discretion of the Project IH Consultant.

1.3.2.36 **Holding Area:** A chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area. The holding area comprises an airlock.

1.3.2.37 **HEPA Filter:** A High-Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers in mass median aerodynamic equivalent diameter.

1.3.2.38 **HEPA Vacuum Equipment:** Vacuuming equipment manufactured with a HEPA filter system.

1.3.2.39 **Leak Tight:** Solids, liquids or dusts cannot escape or spill out.

1.3.2.40 **Log Book:** A notebook or other book containing essential project data and daily project information and a daily project diary. This book shall be kept up to date and on the project site at all times.

1.3.2.41 **Movable Object:** A unit of equipment or furniture in the work area which can be removed from the work area.

1.3.2.42 **Negative Initial Exposure Assessment:** A demonstration by the employer, which complies with the criteria in paragraph (f)(2)(C) of 8 CCR §1529, that employee exposure during an operation is expected to be consistently below the PEL and Excursion Limit.

1.3.2.43 **NIOSH:** National Institute of Occupational Safety and Health.

1.3.2.44 **Phase Contrast Microscopy (PCM):** NIOSH Method 7400 using "A" counting rules.

1.3.2.45 **Plasticize:** To cover floors and walls with plastic sheeting as herein specified.

1.3.2.46 **Presumed Asbestos Containing Material (PACM):** Thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as "PACM" may be rebutted pursuant to 8 CCR §1529 (k)(5).

1.3.2.47 **Prevalent Level Monitoring:** Air sampling conducted for the purposes of evaluating existing ambient airborne fiber concentrations prior to starting abatement activities.

1.3.2.48 **Regulated Area:** An area established by the employer to demarcate areas where Class I, II and/or III asbestos work is conducted, and/or any adjoining area where debris and waste from such asbestos work may accumulate; a work area within which airborne concentrations of asbestos exceed, or where there is a reasonable expectation they may exceed, the permissible exposure limit. Requirements for regulated areas are set out in paragraph (e) of 8 CCR §1529.

1.3.2.49 **Removal:** All herein specified procedures necessary to remove asbestos-containing materials from the designated areas in an appropriate manner and to dispose of these materials at an acceptable site.

1.3.2.50 **SDS:** Safety Data Sheet.

1.3.2.51 **Shower Room:** A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water and suitably arranged for complete showering during decontamination.

1.3.2.52 **Small-Scale, Short Duration Work:** For the purposes of this Specification, asbestos abatement work that meets the Cal-OSHA definition of Class III asbestos work and that can be completed in no more than 4 hours by no more than 2 workers.

1.3.2.53 **Surfacing Material:** Material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings or walls and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

1.3.2.54 **Surfactant:** A chemical wetting agent added to water to improve penetration.

1.3.2.55 **Thermal System Insulation (TSI):** ACM or ACCM applied to pipes, fittings, boilers, breaching, tanks, ducts or other structural components to prevent heat loss or gain.

1.3.2.56 **Time Weighted Average (TWA):** The TWA is an 8-hour time weighted average of the airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air (f/cc) which represents the employee's 8-hour workday exposure as determined by the formula:

$$\text{8-hour TWA} = \frac{(C_1T_1+C_2T_2+C_nT_n)}{480 \text{ minutes}}$$

where "C" is the contaminant concentration measured in units of f/cc and "T" the measurement time period in units of minutes.

1.3.2.57 **Transmission Electron Microscopy (TEM):** A method of analyzing air samples for asbestos fibers using a transmission electron microscope and associated instrumentation.

1.3.2.58 **Visible Emissions:** Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

1.3.2.59 **Washroom:** A room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an airlock.

1.3.2.60 **Wet Cleaning:** The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, and disposing of these cleaning tools as asbestos-contaminated waste.

1.3.2.61 **Work Area:** Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area which has

been sealed, plasticized, and equipped with a decontamination enclosure system. A non-contained work area is an isolated or controlled-access work area which has not been plasticized nor equipped with a decontamination enclosure system.

1.3.2.62 **Worker Decontamination Enclosure System:** That portion of a decontamination enclosure system designed for controlled passage of workers, and other personnel and authorized visitors, typically consisting of a clean room, a shower room, and an equipment room separated by air locks.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Product Prohibitions: The following products or product constituents are prohibited from use during asbestos abatement activities:

2.1.1.1 Any product for which a Safety Data Sheet is available from the manufacturer and has yet to be submitted.

2.1.1.2 Any product for which a less hazardous substitute product is readily available, provided that the substitute product possesses similar performance characteristics.

2.1.1.3 Any product containing any concentration of diethylene glycol dimethyl ether; ethylene glycol monoethyl ether; or ethylene glycol mono methyl ether (skin TLV 5 ppm; CAS 109-86-4). These constituents cause reproductive damage and blood cell damage.

2.1.1.4 Any product containing any concentration of ethylene glycol (1,2 Ethanediol glycol; TLV = 50 ppm). This chemical causes kidney damage if ingested.

2.1.1.5 Any product containing any concentration of formaldehyde, a suspect carcinogen.

2.1.1.6 Any product containing any concentration of methylene chloride, a suspect carcinogen.

2.1.1.7 Any product containing any concentration of n-hexane. This chemical causes peripheral nerve damage (potential ingredient in spray adhesive).

2.1.1.8 Any product containing any concentration of isocyanates. An allergic sensitizer, this group of chemicals typically has no warning properties (potential ingredient in spray foams and some epoxies).

2.1.1.9 Non-fire rated visquene and/or non-fire rated lumber are prohibited from use.

2.1.1.10 Solvents with a flash point $<140^{o}$ F are prohibited from use.

2.1.2 Equipment Prohibitions: The following equipment is prohibited from use during asbestos abatement activities:

2.1.2.1 Fasteners: High velocity powder-actuated fasteners are prohibited from use without the expressed written permission of the County.

2.1.2.2 Torches: Open flame torches are prohibited from use for asbestos abatement purposes.

2.1.2.3 Compressed Air: Air compressors, leaf blowers or similar forced-air equipment is prohibited from use for asbestos abatement purposes.

2.1.2.4 Lamps: Sodium or mercury vapor (metal halide) lamps are prohibited from use.

2.1.2.5 Ladders: Wooden or metal ladders are prohibited from use.

2.1.2.6 Engines: Internal combustion engines shall not be permitted for operation indoors without the expressed written permission of the County in consultation with the Project IH Consultant.

2.1.2.7 Grounded Electrical Equipment: Electrical equipment manufactured with internal grounding or grounded wiring shall not be used if the grounding has been removed, tampered with, or otherwise altered.

2.1.2.8 HEPA-Filtered Vacuum Cleaners without Certification of Efficiency Challenge Testing: Vacuums without certification of on-site testing for efficiency ("DOP testing") shall not be allowed for use outside of a negative differential pressure enclosure ("containment").

2.1.3 Material Requirements:

2.1.3.1 Sealants: Sealants used will have a flame spread, smoke and fuel contribution of zero, and will be ASTM and UL rated for 3 hours for standard method fire test for fire stop systems.

2.1.3.2 Lock-down Encapsulants: Lock-down encapsulants used will be compatible with substrate to which they will be applied, as well as with adhesives or other finish materials which may be applied over such encapsulants.

2.1.3.3 Polyethylene Sheeting: Polyethylene sheeting used will be in compliance with NFPA Standard 701 fire testing, with flame spread $\leq$ 5 and smoke development rating of $\leq$ 70 when tested by ASTM E-84. Minimal thickness will be 6-mil.

2.1.3.4 Spray Poly: Spray poly as a liquid must be non-flammable (no flash point), vapor free, and not noxious; when dry, poly must be Class A rated, with flame spread $\leq$20, have a fuel contribution of zero, and smoke development of $\leq$ 110 by ASTM method E-84.

2.1.3.5 Waste Containers: Waste containers (bags, drums, bins, etc.) must be suitable for loading, temporary storage, transit, and unloading of asbestos waste without rupture, or otherwise causing asbestos exposure to persons nor releases to the atmosphere. Use of rigid primary containers (bins, boxes, drums, etc.) is preferred and recommended. Where rigid primary containers are used, they shall be lined with a secondary leak tight barrier of poly sheeting or poly bags of minimal thickness of 6-mil. All containers used for disposal of asbestos-containing waste shall be labeled in general accordance with applicable regulations, and in specific with the requirements of 8 CCR §1529(k)(8) and BAAQMD Regulation 11, Rule 2. See section 3.2.3.2 of this Specification section for additional details.

2.1.3.6 Adhesives: Adhesives, whether tape or aerosol liquid, shall be capable of securely bonding plastic to plastic, or plastic to substrate. The bonding strength and resulting seal of the material used must not be compromised by mist or water, encapsulating agent or any other product or process used in the regulated work area.

2.1.3.7 Warning Signs and Labels: Warning signs and labels will be used in compliance with applicable federal, state, and local regulations. Signs must be lettered in the language(s) necessary to communicate the specific hazard warning(s) to workers or visitors reasonably expected to be at the job site.

2.1.4 Equipment Requirements:

2.1.4.1 General: It is the responsibility of the Contractor to utilize tools and equipment that have been thoroughly and adequately decontaminated prior to their delivery to this project site. All equipment brought onto this project work site will be subject to inspection by the County and/or the Project IH Consultant. Visible evidence of suspected equipment contamination will be sufficient to cause the equipment to be rejected from mobilization onto the project work site. All costs resulting from the need to decontaminate any part of the worksite contaminated by the Contractor's use of inadequately decontaminated equipment will be borne by the Contractor.

2.1.4.2 Differential Air Pressure Equipment: Differential air pressure equipment (also known as "exhaust fan units" or "negative air machines") shall be equipped with HEPA filtration. All differential air pressure equipment will be in well-maintained condition and will comply with ANSI/AIHA Standard Z9.2 for performance. Differential air pressure equipment will arrive on-site with the intake and exhaust openings sealed. Each unit must be efficiency-challenged ("DOP tested") on-site, in the presence of the Project IH Consultant and prior to use, so as to ensure a minimum 99.97% filtering efficiency of aerosol particulates of 0.3 microns in size. DOP testing shall be performed by a professional third-party testing firm not otherwise financially affiliated with the Contractor. Each unit used on this project must have a certification label affixed to it attesting to its most recent successful testing. Upon arriving on-site, each unit must be visibly clean and free of apparent or suspected asbestos contamination, as judged by the Project IH Consultant. If, in the opinion of the Project IH Consultant, the differential air pressure units are judged to be in need of cleaning, maintenance, or in any other way fail to meet typical industry standards, the unit(s) may not be placed into operation on this project. If secured, negative air machines may be stacked, but no more than two high without the prior approval of the Project IH Consultant, and in no event will negative air machines be allowed to be inverted for the purpose of stacking.

2.1.4.3 HEPA-filtered Vacuum Cleaners: HEPA-filtered vacuum cleaners will be in well-maintained condition, and must be visibly clean and free of apparent or suspected contamination, as judged by the Project IH Consultant. **Each unit must arrive on-site sealed and empty of any debris.** Each unit must be DOP tested on-site, at the building exterior. DOP testing will be performed by a professional third-party firm not otherwise financially affiliated with the Contractor. Each unit used on this project must have a certification label affixed to it attesting to its most recent successful testing. If, in the opinion of the Project IH Consultant, the HEPA-filtered vacuum cleaners are judged to be in need of cleaning, maintenance, or in any other way fail to meet typical industry standards, the vacuum cleaners may not be placed into operation on this project. Care will be exercised by the Contractor to prevent

commingling of asbestos and lead waste. Separate vacuums will be used for each type of waste clean-up.

2.1.4.4 Lights and Electrical Cords: Electrical lights and equipment utilizing electrical power cords will be in well-maintained condition and will be visibly clean and free of apparent contamination, as judged by the Project IH Consultant. All lighting and electrical equipment must be water resistant. Work lighting must have protective covers over the light source. Grounded electrical equipment will be used with grounded electrical supply and outlets. Where such equipment will be used in the near vicinity of water, ground fault circuit interruption (GFCI) protection shall be used in the wiring circuit at the first feasible point closest to the source of power.

2.1.4.5 Personnel Decontamination Facilities (Class I): At a minimum, a 3-chamber personnel decontamination (decon) unit with functioning shower will be constructed in series and used whenever Class I work is being conducted. A decon unit with shower will be constructed contiguous with each Class I regulated work area. Use of a remote shower for Class I work may be allowed where a contiguous shower is infeasible, as judged by the Project IH Consultant. A curtained doorway (see Section 1.3.2 above) will be constructed to separate individual chambers within a personnel decon unit, as well as at ingress and egress points. The decon units shall be constructed in a manner so as to be free of physical hazards (e.g., jagged metal or exposed wood surfaces). **To the extent feasible, a personnel decon unit must not be used for waste load-out.**

2.1.4.6 Personnel Decontamination Facilities (Class II): At a minimum, a 2-chamber personnel decontamination (decon) with separate clean room and equipment room will be constructed in series and used whenever Class II work is being conducted indoors. For exterior Class II work where containment is not required, a single stage designated decontamination area will be established. A decon unit/area will be constructed contiguous with each Class II regulated work area. A curtained doorway (see Section 1.3.2 above) will be constructed to separate individual chambers within a personnel decon unit, as well as at ingress and egress points. The decon units shall be constructed in a manner so as to be free of physical hazards (e.g., jagged metal or exposed wood surfaces). Personnel decontamination facilities used for Class I work may be used for Class II work. **To the extent feasible, a personnel decon unit must not be used for waste load-out.**

2.1.4.7 Water Filtration Equipment: Water collected from decontamination and general asbestos abatement activities must be filtered prior to discharge. Water will be filtered through a system capable of trapping particles 1 micron and larger in size, intended to remove asbestos fibers. Filtered water may be discharged into a sanitary sewer system, if the Contractor can satisfactorily demonstrate that it is acceptable to the local wastewater treatment facility to do so. The Contractor will bear the responsibility to investigate discharge requirements and to obtain any necessary discharge permits prior to the start of work. To the extent feasible, water should be reclaimed and used on-site for application in wet method work practices prior to its discharge.

2.1.4.8 Fire Extinguishers: Fire extinguishers, rated not less than 2A or as specified by more stringent regulations, will be required in the regulated work area(s). The minimum

allowable number of fire extinguishers in any individual work area will be one in the regulated work area and one in the clean area.

2.1.4.9 Smoke Detectors: The Contractor will exercise due caution to not engage in activities that will inhibit the proper functioning of operable smoke detectors during the Work. The Contractor will take steps to preserve and protect any operable smoke detectors from damage during the Work. The Contractor must coordinate in advance with the local fire authority and the County prior to proceeding with any work activities that may require the disabling of an installed fire suppression system or a smoke detector. The Contractor will designate a person or persons to the responsibility of "Fire Watch" for the duration of time that an installed fire suppression system or a smoke detector(s) is required to be disabled.

2.1.4.10 Manometers: Use of data-logging manometers to record differential air pressure measurements within all regulated work area containments is required on this project, irrespective of the Cal/OSHA Class of asbestos work being undertaken. A separate manometer shall be used to document diminished air pressure differential within each regulated work area. Exceptions will not be allowed due to concerns for equipment security. It is the Contractor's responsibility to provide and secure all equipment for the duration of this project. Manometers used to monitor air pressure within a regulated work area shall have been calibrated to the manufacturer's specifications within the previous 12 months. Manometers shall have real-time digital read-out; an audible alarm; a hardcopy record (tape or circular disk) and be capable of continuous data logging and printing out a data record. The data collected will begin at the time of the initial establishment of a diminished air pressure differential within a regulated work area and continue until acceptable analytical results of final air clearance testing results for that work area are received and conveyed to the Contractor.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Examination of Conditions: The Contractor must carefully examine the work site before beginning work and report any previously undisclosed or special conditions to the County. Except as may be otherwise stipulated elsewhere in the Contract Documents, starting the Work shall be interpreted as implied acceptance of site conditions as they exist.

3.1.2 Responsibility for Work: By commencing the Work, the Contractor acknowledges and agrees that he has sole and primary responsibility and obligation to the County to make inspections of his own work at all stages of the Work. This includes acknowledging and agreeing that he has sole responsibility to supervise or superintend the performance of the Work, and that said work will be in strict adherence to, and in compliance with, all applicable methods, materials, regulations, and required standards whether or not specified herein. The Contractor is responsible for site security upon starting the project. This responsibility extends 24 hours per day until project completion and final demobilization.

3.1.3 Coordination of Work: The Contractor is responsible to coordinate all scheduling, phasing, and completion of asbestos related work with the County and all other employers working on the job site during the asbestos related activities. This includes the responsibility to make notifications or communications of hazards to other trades or employers, as required by regulation.

3.1.4 Measurements and Quantities: The Contractor is responsible to field verify all measurements, dimensions and/or quantities before the start of work. Discrepancies between plan and field dimensions or quantities shall be reported to the County as soon as discovered.

3.1.5 Job Site Postings: Prior to commencing any preparation of the work area(s) for asbestos related operations, the Contractor will post all required documents, warning signs, and erect any physical barriers in order that the work area(s) may be secured. Prior to the commencement of any work, the Contractor will post bilingual or multi-lingual (as appropriate) warning signage in and around the work site in compliance with applicable regulations.

3.1.6 Pre-Work Conference: Prior to the start of any work, the Contractor will meet at the project site with the Project IH Consultant, the County, and other entities involved in, or associated with, the asbestos related work. This will be an organizational meeting to review responsibilities and personnel assignments; to identify any special needs or conditions pertaining to the Work or its completion; to identify the work area containment(s) and decontamination areas; and to coordinate temporary facilities including power, light, water, waste storage, etc.

3.1.7 Work Area Preparation:

3.1.7.1 Applicability: All asbestos related removal work designated by Cal OSHA as Class I or Class II asbestos work shall be completed in accordance with Cal OSHA Construction Safety Orders for Asbestos (8 CCR 1529). Where conflicts between work area preparations as described in the regulations versus specification exist the more stringent interpretation shall apply.

3.1.7.1.1 Removal of the ACMs identified in Section 1.1.1 – Scope of Work shall be classified as a Class II asbestos job.

3.1.7.2 Work Area Designation: Each regulated work area will be designated by the Contractor and discussed with the Project IH Consultant prior to its preparation. At a minimum, discussion topics will include ingress and egress points, work area configurations, containment methods, location of viewing ports, and installation of decontamination system enclosures. This communication may be accomplished at the Pre-Work Conference.

3.1.7.3 Electrical Lock-out: The Contractor, in coordination with the County, is responsible for the shutdown and disconnection of all electrical power within the work area. For the purposes of this Specification section, the work area is defined as including all wall, floor and/or ceiling cavities which will be opened as a result of the removal of wall, floor or ceiling materials. The Contractor will arrange for temporary power and lighting, and will ensure safe installation of temporary power sources and equipment per applicable electrical code requirements. The Contractor should notify the County in writing before disconnecting any power or communication lines that may service the subject buildings or adjacent buildings.

3.1.7.4 HVAC Isolation: The Contractor is required to shut down and isolate mechanical (heating, cooling, and ventilating) air systems to prevent contamination or fiber dispersal to other areas of the building. During the Work, HVAC vents and any other airway openings into and out of the Work Area will be sealed with barriers consisting of a minimum 2 layers of 6-mil poly sheeting and duct tape ("critical barriers"). In

the event of any containment breaches, filters in the HVAC system(s) will be removed and disposed of as asbestos-contaminated waste.

3.1.7.5 Work Area Containment: Each regulated work area will be regulated and isolated ("contained") from all building areas not a part of the Work. All critical openings including, but not limited to, doorways, windows, tunnels, ducts, grills, diffusers, or openings through which ducting, piping or conduit passes are to be sealed securely with duct tape, spray adhesives, plastic sheeting or by other means, as necessary, to prohibit the passage of air out of the regulated work area. When removal of ACM from the exterior of a building is conducted using manual non-powered tools or equipment, and that which does not generate a Regulated ACM or require containment per BAAQMD Regulation 11, Rule 2, the work area isolation may be achieved using barrier tape or other appropriate means to demarcate the perimeter of the regulated work area. Any fixed objects to remain within the proposed work area will be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate, and completely enclosed with plastic sheeting. The plastic sheeting shall be, at a minimum, 6-mil fire-rated poly. If a containment is utilized as a regulated area then the Contractor will inspect the containment for gaps, breaches, tears, leaks, holes or other deficiencies. The Contractor will conduct a similar inspection not less than once at the start of each work shift, however, the Contractor will be responsible to ensure the integrity of the containment(s) at all times. Containment deficiencies shall be corrected immediately and with utmost priority upon discovery.

3.1.7.6 Decontamination Facilities: At a minimum, a 3-chamber personnel decontamination (decon) unit with functioning shower will be constructed and used whenever Class I work is being conducted (See Section 2.1.4.5 above). Cover the floor under the decontamination units, hoses, and equipment with at least one layer of 6-mil poly. Securely affix the poly sheeting to the floor. A personnel decon unit with shower will be constructed contiguous with each Class I regulated work area. Use of a remote shower for Class I work may be allowed where a contiguous shower is infeasible, as judged by the Project IH Consultant. A curtained doorway (see Section 1.3.2 above) will be constructed to separate individual chambers within a personal decon unit, as well as at ingress and egress points. The decon units shall be constructed in a manner so as to be free of physical hazards (e.g., jagged metal or exposed wood surfaces). Alternate decontamination facilities may be used for compliance with Class II asbestos work or asbestos roofing removal work (See Section 2.1.4.6 above). **To the extent feasible, a personnel decon unit must not be used for waste load-out.**

3.1.7.7 Movable and Loose Items: Movable and loose items located within the work area(s) and not removed by the County are to be cleaned using HEPA-filtered vacuum equipment and/or wet cleaning methods, as appropriate, and will be removed from the work area to a temporary location designated by the County. The items will be received by and protected from future damage or loss by the County.

3.1.7.8 Pre-Cleaning: The Contractor will clean each work area prior to commencing the construction of a regulated work area. Such "pre-cleaning" will be by means of HEPA-filtered vacuum equipment and/or wet cleaning methods, as appropriate. The Contractor will use cleaning methods that minimize dust generation. Prohibited methods include shoveling, dry sweeping, use of forced or compressed air, or

vacuuming with equipment not equipped with HEPA filtration. Workers engaged in "pre-cleaning" activities are required to use appropriate personal protective equipment, including respiratory protection.

3.1.7.9 OSHA Class I Work Area Isolation: For Work Areas within which OSHA Class I asbestos work is to be conducted (removal of thermal system insulation [TSI] or surfacing material), the Contractor will erect a full, diminished air pressure enclosure. In addition to sealing critical openings, a minimum of one layer (additional layers may be required based on the localized conditions) of fire-rated 6-mil plastic sheeting will be installed on the walls, floors, and ceilings (as appropriate for the location and/or type of material[s] being removed). Exceptions to this may apply to the removal of TSI by means of glovebag techniques. In the case of TSI removal using glovebags, full-room ("secondary containment") or partial-room ("mini-enclosure") containment structures may, at the Project IH Consultant's discretion, be additionally required. Floor layers shall be applied making sure that plastic is turned-up at the wall at least 16 inches and sealed to wall layers. Wall layers shall be sealed by overlapping the turned-up floor plastic a minimum of 12 inches. All joints and seams for each layer shall be glued and taped securely in a manner so as to prohibit water or air movement through the attached sheetings.

3.1.7.10 "Wrap and Cut" Removal of TSI: For Work Areas within which OSHA Class I asbestos work consisting primarily of TSI (piping insulation) removal is to be conducted by means of "Wrap and Cut" method, the Contractor will prepare the Work Area in full compliance with the requirements of BAAQMD Regulation 11, Rule 2, and the requirements of Cal-OSHA 8 CCR §1529 (g) for conducting Class I asbestos work. Removal of asbestos-containing TSI for the purposes of accessing the piping to facilitate cutting the pipe will be done by first removing a portion of the TSI by glovebag method and sealing the remaining cut ends of asbestos-containing materials. Once the uninsulated pipe is exposed, the remaining insulated section to be removed will be wrapped in a minimum of two layers of 6-mil poly before being removed from the work area. For the purposes of this Work, "Wrap and Cut" removal of TSI will meet the regulatory definitions of "removal" and "removing" set forth in Cal-OSHA 8 CCR §1529 et. seq. and BAAQMD Regulation 11, Rule 2, respectively. The Contractor will seek and obtain the approval of the County prior to implementing "Wrap and Cut" activities.

3.1.7.11 OSHA Class II Work Area Isolation: For Work Areas within which OSHA Class II asbestos work is to be conducted, the Contractor will prepare the Work Area in accordance with the regulatory requirements of Cal-OSHA 8 CCR §1529 et. seq. and BAAQMD Regulation 11, Rule 2. In addition to sealing critical openings, a minimum of one layer (additional layers may be required based on the localized conditions) of fire-rated 6-mil plastic sheeting will be installed on the walls, floors, and/or ceilings (as appropriate for the location and/or type of material[s] being removed). Floor layers shall be applied making sure that plastic is turned-up at the wall at least 16 inches and sealed to wall layers. Wall layers shall be sealed by overlapping the turned-up floor plastic a minimum of 12 inches. All joints and seams for each layer shall be glued and taped securely in a manner so as to prohibit water or air movement through the attached sheetings. In addition, a diminished air pressure enclosure, as documented by manometric measurements (see Section 2.1.4.10 above)

is required for all OSHA Class II Work. OSHA Class I Work Area isolation controls may be used for Class II work.

3.1.7.11.1 *Exception:* For Work Areas within which OSHA Class II asbestos work is being conducted on the exterior of the building, and the asbestos work does not require containment under negative pressure per BAAQMD Regulation 11, Rule 2, then the contractor may isolate the work area using barrier tape or other appropriate measures to demarcate the regulated work area perimeter and prevent unauthorized entry. Critical openings, such as windows, doorways, louvered grills, HVAC intakes or other openings to the building located within the work area must be sealed as indicated in Section 3.1.7.5 and prevented from opening while the abatement work is being carried out. Plastic sheeting shall cover all horizontal surfaces within the work area to sufficiently capture all falling debris and prevent surfaces from being contaminated during removal.

3.1.7.12 Localized Limited Work Area Isolation: For Work Areas where small-scale, short duration ACCM or ACM removal work will occur, the Contractor may, with the approval of the Project IH Consultant, use Localized Limited Work Area Isolation ("mini-containment") methods. For the purposes of this Specification, the phrase "small-scale, short duration ACCM or ACM removal work" shall generally apply to that ACCM or ACM removal work which can be completed by no more than two (2) workers in no more than four (4) hours; and which generates no more ACCM or ACM waste than can be contained in one (1) standard-sized (60-inch by 60-inch) waste bag. At a minimum, such a Work Area shall be fully enclosed with one layer of 6-mil plastic; critical barriers shall be sealed; the mini-containment shall have a diminished interior pressure differential, and a curtained doorway for ingress/egress use. Additional enclosure measures may be required at the discretion of the Project IH Consultant. Localized Limited Work Area containments must be constructed so as to comply with all regulatory requirements including, but not necessarily limited to, BAAQMD and Cal-OSHA.

3.1.7.13 Substrate Removal: In certain locations, asbestos-containing materials to be removed may have been identified as being present on wooden or other substrates that will also be subject to building demolition (e.g., adhesive on wallboard). At the Contractor's discretion, and with the concurrence of the County, such materials may be removed by means of removing the substrate material to which the ACM or ACCM is adhered. As a priority, consideration must be given to the use of methods that will minimize the weight or volume of waste generated by the use of this removal method. This method of removal should not be employed in locations where doing so will result in the creation of an imminent safety hazard.

3.1.7.14 Work Area Obscurity: The Contractor will endeavor to block or obscure the view of the public into the asbestos abatement work areas, but retain appropriate view portals in compliance with BAAQMD.

3.1.7.15 Adjacent Areas: Building areas immediately adjacent to regulated asbestos removal areas, such as corridors or hallways which are not themselves subject to asbestos material removal, but are necessary routes to and from regulated work areas, must be protected by the Contractor to prevent damage and/or contamination. Openings from

these areas into areas where asbestos material removal activities will be conducted will have curtained doorways to further minimize air passage into non-regulated areas. The Contractor will also be responsible to make all required notifications to trades or other building occupants in areas adjacent to regulated abatement work areas.

3.1.7.16 Emergency Exits: The Contractor shall establish emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to the County and to local emergency authorities or other applicable agencies.

All exits leading out of regulated work areas shall be marked in bold lettering "EXIT" or "Emergency Exit." Exit markings shall be in the primary language(s) appropriate to communicate with the workers present in the work area.

3.1.7.17 Work Area Communications: The Contractor will be responsible for establishing and maintaining clear communications between the personnel in the work area(s) and those stationed outside, such that those communications can be maintained without need for workers to perform an exit from the work area that would require decontamination.

3.1.7.18 Work Area Viewing Windows: If a containment is utilized as a regulated area then the Contractor will provide and construct observation windows into all regulated work area containments. The viewing windows will be of a visually transparent material of approximately 18”(H) x 24”(W) in size and/or will be constructed and maintained so as to allow unobstructed observation of the entire work area from outside the containment.

3.1.7.19 Differential Air Pressure: Prior to the start of asbestos removal work, the Contractor will install HEPA-filtered differential air pressure equipment (also known as “exhaust fan units” or “negative air machines”), as specified herein, to maintain a diminished air pressure differential within the Work Area. These exhaust fan units will remain in place within a regulated Work Area throughout the abatement and decontamination phases of the Work until the required visual and/or clearance air testing has been satisfactorily achieved. A minimum pressure differential of -0.03 inches of water column (-0.03” w.c.), with respect to the air pressure of the area outside a Work Area, will be established and must be maintained at all times within all regulated Work Areas. Sufficient number of exhaust fan units shall be utilized to achieve a minimum of four (4) air changes per hour, per containment. The Contractor shall have sufficient auxiliary units on-site and/or in place to maintain this requirement throughout the Work, including backup or replacement units in the event of equipment failure. Air exhausted from this equipment shall be exhausted to the outdoors and, to the extent feasible, away from occupied areas around the building. Documentation of satisfactory differential air pressure shall require the use of a manometer, as specified herein. If, in the opinion of the Project IH Consultant, the differential air pressure units are judged to be in need of maintenance or in any other way fail to meet typical industry standards, the units shall not be placed into operation on this project.

3.1.7.20 Pre-Abatement Work Area Inspections: Prior to the start of asbestos removal work, the Contractor, accompanied by the Project IH Consultant, will conduct a detailed inspection of all equipment and Work Area isolation preparations to assure that appropriate engineering controls are in place and are functioning sufficiently to contain asbestos fibers to within the Work Area. The concurrence of the Project IH Consultant will be required to determine that a Work Area has undergone adequate preparation to proceed with asbestos removal work. A Pre-Abatement Work Area inspection will be conducted for each regulated Work Area and each individual inspection must be documented in writing. Such documentation will be signed by the individual(s) conducting the inspection. A copy of each such documentation will be obtained by the Project IH Consultant for conveyance to the County.

3.2 ASBESTOS RELATED CONSTRUCTION WORK PRACTICES

3.2.1 ACCMs that are anticipated to be disturbed during asbestos related work are summarized in Section 1.1.1 of this document.

3.2.2 Work Practices:

3.2.2.1 At all times, the Contractor will employ work practices intended to maintain an orderly and safe work place. This will include, but not be limited to: pre-cleaning the work area; adequately wetting ACCM or ACM prior to its disturbance and during its removal; prompt clean-up and storage of ACCM or ACM waste in leak-tight containers; use of HEPA-filtered vacuums and exhaust fan units; and employing all feasible engineering controls necessary to prevent elevated airborne asbestos concentrations within and outside of the Work Area(s).

The Project IH Consultant may collect air samples during the project to document airborne fiber levels inside the Work Area(s) and in locations outside the Work Area(s). The Contractor will be required to take immediate corrective action if perimeter samples exceed 0.01 fibers/cubic centimeter (f/cc) by PCM analysis, are overloaded, or exceed 70 structures/square millimeter (s/mm^2) by Transmission Electron Microscopy (TEM).

3.2.2.2 OSHA Class I Asbestos Work: Materials designated for removal as OSHA Class I Asbestos Work will be removed in full compliance with the Class I work practices (i.e., Methods of Compliance) prescribed in Cal-OSHA's Construction Safety Orders for Asbestos (8 CCR §1529, et. seq.). All ACM or ACCM designated for removal as Class I Asbestos Work will likewise be removed in full compliance with the BAAQMD's Regulation 11, Rule 2. Class I Asbestos Work may not commence until the work area(s) is/are prepared in accordance with section 3.1.7.9. (or, in the case of TSI removal by "Wrap and Cut" method, section 3.1.7.10.) of this Specification section.

3.2.2.3 OSHA Class II Asbestos Work: Floor tiles, mastics, and other materials designated for removal as OSHA Class II Asbestos Work will, at a minimum, be removed in full compliance with the Class II work practices (i.e., Methods of Compliance) prescribed in Cal-OSHA's Construction Safety Orders for Asbestos (8 CCR §1529, et. seq.). All ACM or ACCM designated for removal as Class II Asbestos Work will likewise be removed in full compliance with the BAAQMD's Regulation 11, Rule 2. Class II

materials should, to the extent feasible, be removed with hand tools, so that they remain substantially intact. Class II Asbestos Work may not commence until the work area(s) is/are prepared in accordance with section 3.1.7. At the discretion of the Project IH Consultant, use of mechanical or motorized removal methods may be permitted, provided the proposed method(s) is/are not prohibited under Cal-OSHA or BAAQMD work practices, and the work is being conducted in a diminished air pressure enclosure. **Floor tile and/or floor tile mastic removal operations involving the use of mechanized work methods, including motorized floor buffers, must be conducted utilizing OSHA Class I Work Area Isolation methods and engineering controls as described in section 3.1.7.9 of this Specification section. This includes preparing the Work Area(s) in accordance with BAAQMD requirements for the removal of RACM.** ACM shall be wetted prior to and during its removal, handling, and waste disposal. Low-odor, solvent-based mastic removers may be used to remove ACM mastics, provided the product(s) meets the requirements of Section 2.1 – MATERIALS of this Specification, and provided the waste generated by their use is managed in accordance with applicable state and federal regulations.

3.2.2.4 Work Area Regulation: All asbestos removal Work Areas shall be regulated to prevent unauthorized entry. Isolation methods shall include, but not necessarily be limited to: the use of barrier tape (yellow "Caution" and/or OSHA's "Danger Asbestos") and OSHA's "Danger Asbestos" sign(s). The Contractor shall maintain a daily Work Area entry/exit log and require all persons entering the Work Area to sign in and out. The Contractor will bear sole responsibility for controlling entry into the Work Area(s).

3.2.3 Work Area Decontamination

3.2.3.1 Initial Cleaning: Clean-up and containerization of ACCM or ACM waste will be an on-going activity throughout the Work. ACCM or ACM gross debris must not be allowed to accumulate within the Work Area for subsequent clean-up. ACM must be wetted and kept wet throughout the work. All uncontained ACM waste must, at a minimum, be bagged and sealed in leak tight containers by the end of each day's work shift. Containerized waste may be stored within the Work Area during the work, but must be removed from the Work Area for storage in a secured location on a daily basis. All containerized waste must be removed from the regulated Work Area prior to conducting visual inspections. In no event may the accumulation of containerized waste within the Work Area be allowed to impede the work progress or compromise work site safety.

3.2.3.1.1 While removal work is in progress and the scope of work has not been completed by the end of the work shift, plastic sheeting used to cover the ground around the building perimeter shall not be permitted to remain in place overnight. The plastic sheeting shall be thoroughly cleaned and properly package for disposal with the ACM waste at the end of each work shift.

3.2.3.2 Containerization of Waste: Unless otherwise authorized, ACCM or ACM waste will be containerized in rigid primary waste containers (boxes, drums, bins, etc.) suitable for loading, temporary storage, transit, and unloading of asbestos waste without

rupture, or otherwise causing exposure to persons or releases to the atmosphere. Rigid primary containers must be lined with a leak tight barrier of poly sheeting or poly bags of minimum thickness of 6-mil. Waste containerized in bags will be double-bagged, evacuated of air, "goose-necked" and sealed with duct tape. All containers used for disposal of asbestos-containing waste must be labeled in general accordance with applicable regulations, including the requirements of 8 CCR 1529 (k) (8) and BAAQMD Regulation 11, Rule 2.

3.2.3.3 Detail Cleaning: Following gross removal of ACM or ACCM, any remaining substrate surface is to be detail cleaned using a combination of hand tools (scrapers, wire brushes, etc.), wet-wiping, and HEPA vacuuming. The substrate and containment will be considered to be adequately cleaned when no visible and no three-dimensional remnant of the ACM or ACCM can be seen or felt. This determination will be made by the Project IH Consultant on a case-by-case basis. In no event may encapsulation of residual ACM or ACCM be used in lieu of detail cleaning. Complete removal of an asbestos-impregnated porous substrate is an acceptable method of removal, so long as doing so does not introduce additional hazards into the Work Area, and with the additional requirement that the entire removed material be treated for disposal purposes as ACM or ACCM. See section 3.1.7.12. of this Specification section for additional requirements.

3.2.3.4 Waste Load Out: Prior to the removal of containerized waste from the Work Area, each container is to be wet-wiped to remove any residual asbestos contamination. Double-bagging of waste must be completed within the regulated Work Area and the exterior of each bag or container must be individually wet-wiped prior to removal from the Work Area. Waste will be loaded out of the Work Area through the equipment decontamination ("waste load out") chamber and <u>not</u> through the personal decon. Once outside of the Work Area, the waste will be transported in rigid movable bins, wheelbarrows or comparable directly to a secured waste storage location.

3.2.3.5 Post-Abatement Work Area Inspections: Subsequent to the completion of the cleaning phases and waste load-out, the Contractor's Supervisor, accompanied by the Project IH Consultant, will conduct a detailed visual inspection of the Work Area to assure that the identified asbestos has been removed and that the Work Area has been adequately cleaned. The concurrence of the Project IH Consultant will be required to determine that a Work Area has undergone adequate cleaning. This Post-Abatement Work Area inspection will be conducted for each regulated Work Area and each individual inspection must be documented in writing. Such documentation will be signed by the individuals conducting the inspection(s). A copy of each such documentation will be obtained by the Project IH Consultant for conveyance to the County. Prior to conducting a Post-Abatement Work Area inspection, the Contractor will remove and replace the primary filter ("pre-filter") on each differential air pressure unit ("negative air machine"). All non-essential equipment is to be decontaminated, as described herein, and removed from the Work Area prior to commencing the Post-Abatement Work Area Inspection.

3.2.3.6 Equipment Decontamination: Prior to removal from a Work Area, the Contractor will decontaminate all tools and equipment. Decontamination will include, but not be limited to: wet-wiping, HEPA-vacuuming, and containerizing tools into subsequently

decontaminated containers. Prior to removal from the Work Area, HEPA-filtered vacuum cleaners will be wet-wiped and wrapped, bagged or otherwise containerized for transport from the Work Area. Likewise, differential air pressure equipment is to be sealed with poly sheeting and tape, and externally decontaminated before removal from the Work Area. All equipment will be subject to inspection by the Project IH Consultant prior to its demobilization from a regulated work area.

3.2.3.7 Encapsulation: Upon successful compliance with the requirements for Post-Abatement Work Area Inspection, and unless otherwise specified, the Contractor shall apply a "lock-down" encapsulant to all surfaces within the contained Work Area. The encapsulant must be compatible with the existing surfaces. Following application of the encapsulant, a sufficient amount of time must pass to allow for the encapsulant to dry. The Contractor should plan, at a minimum, to allow for an extended (preferably overnight) drying period. In all instances, the decision as to whether an adequate drying period has elapsed will be at the discretion of the Project IH Consultant. Upon completion of the asbestos-related work, the Contractor shall apply an encapsulant to all surface edges of the disturbed asbestos-containing materials within the Work Area to prohibit fibers becoming airborne.

3.2.3.8 Poly Removal: Once satisfactory Post-Abatement Work Area Inspections have been documented in writing and after any applied encapsulant has been allowed to dry, the Contractor will remove the top layer of plastic on the walls, floors, and/or ceilings (as appropriate). The inner plastic layer (if present) and primary isolation barriers (i.e. "critical barriers") on vents, grilles, diffusers, etc., are to remain in place for the clearance air sampling. Care should be taken to avoid pulling down any remaining layer(s) of plastic sheeting. In Work Areas where a single layer of plastic has been used on the walls, floors, and ceilings (where applicable), that plastic layer shall be removed and critical barriers are to remain in place until air clearance sampling is completed and satisfactory air clearance criteria have been met. No alternative approaches are to be implemented without the prior agreement of the Project IH Consultant. The Contractor will containerize removed plastic and any remaining debris, decontaminate the containers, and dispose of as ACM-contaminated waste. All other isolation engineering controls including decontamination facilities are to remain in place until the specified air clearance testing criteria have been met. **Removal of plastic layers and isolation engineering controls ("teardown") may not occur without the knowledge and consent of the Project IH Consultant.**

3.2.4 Personal Protection

3.2.4.1 General: The Contractor is solely responsible for the safety, efficiency, and adequacy of his work, workers, equipment and methods, and for any damages which may result from their inappropriate actions, practices, construction, maintenance, or operations. The Contractor will erect and maintain at all times, as required by the condition and progress of the Work, proper safeguards for the protection of the workers and the public, including the posting of appropriate and applicable warning signage on the site.

3.2.4.2 Competent Person: The Contractor will designate a responsible member of its organization to be present on the work site, whose duty shall be the detection, recognition, and prevention of accidents and potential accidents. The designated individual will assume and fulfill the duties of the Competent Person, as defined in 8 CCR §1529 et. seq. In the absence of notice to the contrary, provided in writing to

the Project IH Consultant, this person will be the on-site Supervisor or Foreman of the Asbestos Abatement Contractor.

3.2.4.3 Toxic Exposure Responsibility: To the extent allowable by law, the Contractor assumes all responsibility for any toxic exposures or effects experienced by workers as a result of the air quality supplied to respirators. The Contractor will assume all responsibility for any toxic exposures or effects to all personnel or property caused by airborne particulates, mists, vapors, or any wetting agent(s), or hazardous substances, and for the legal disposal of said substances and/or any residual toxic residues. Commencement of the Work by the Contractor will constitute implied acceptance of these responsibilities.

3.2.4.4 Worker Discipline: The Contractor will at all times establish and maintain discipline and good order over its employees. The Contractor will not employ on the work crew any person not skilled in the Work assigned, nor anyone who has not received notice and instructions in the dangers of asbestos exposure, and in the methods of reduction of the dangers associated with its disturbance. Workers must also receive training in the proper use of respirators, safety procedures, equipment, protective clothing, and appropriate work procedures. The Contractor will remove any employee from the job site failing to adhere to any standard or requirement set forth herein.

3.2.4.5 Work Crew Size: The Contractor is responsible for setting the size of its work crew(s), subject to the conditions stated in this paragraph. During asbestos removal operations, a minimum of two (2) workers must be in a work area at any time. No worker shall be allowed to work alone in a regulated work area. Under no circumstances may workers within a regulated work area be allowed to work without the supervision of an on-site foreman. The crew size on any given day shall be adequate to progress and/or complete the Work in accordance with the established Project Schedule.

3.2.4.6 Respiratory Protection: Prior to commencement of work, all workers must be instructed and must be knowledgeable in the use of respiratory protective equipment. All respiratory protection is to be provided to workers in conjunction with a respiratory protection program which shall meet the requirements of Cal-OSHA 8 CCR §5144 et. seq. and 8 CCR §1529 et. seq. This includes, but is not limited to, qualitative or quantitative fit testing. The following additional requirements shall apply:

3.2.4.6.1 The Contractor will provide its workers with respiratory equipment approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres containing asbestos fibers. Respiratory protection will be issued to each worker for their sole and individual use. Respiratory protection will be worn by all on-site personnel entering into a regulated Work Area or who may otherwise be potentially exposed to asbestos. Respiratory protection is to be worn at all times when inside a regulated Work Area, as well as during personal decontamination.

3.2.4.6.2 Where respirators with disposable filters are employed, the Contractor will provide sufficient filter cartridges for replacement as necessary by the worker, or as required by the applicable regulation.

3.2.4.6.3 The Contractor will supply all its employees with adequate respiratory protection, to meet the minimum standards of the applicable Cal-OSHA requirements. In accordance with 8 CCR §1529 et. seq., the Contractor will have a Competent Person conduct exposure assessments and periodic monitoring to establish the minimum appropriate respiratory protection to be used and the effectiveness of the chosen respiratory protection. In the absence of data acceptable to the Project IH Consultant as satisfying the requirements for a Negative Exposure Assessment [8 CCR §1529(b)], the Contractor must conduct Initial Exposure Assessments, as defined in 8 CCR §1529(f)(2). In addition, the Contractor will require and enforce the use of the following activity-related requirements:

(a) Work involving the use of solvents or volatile organic compounds shall be conducted with the use of air purifying respirators equipped with HEPA and Organic Vapor cartridges.

(b) Any question as to respiratory protection requirements for any activity unnamed or not otherwise described herein shall, by default, require the maximum protection.

(c) Appropriate respiratory equipment will be used throughout the project, including during the removal of final layers of plastic after final air clearance is attained.

(d) The minimum respiratory protection to be used during Class I asbestos removal will be powered air-purifying respirators (PAPRs).

3.2.4.6.4 The Contractor shall post in the Equipment Room and the Clean Room, all decontamination and safety procedures to be followed for ingress and egress from a regulated work area.

3.2.4.7 Protective Clothing: The Contractor is to provide workers with sufficient sets of hooded, disposable, full-body coveralls recommended for use in asbestos operations equivalent to DuPont "TYVEK-Type 14". Such full body protective clothing will include, but not be limited to:

3.2.4.7.1 Foot coverings including safety shoes or boots, and/or disposable foot coverings.

3.2.4.7.2 Protective head coverings (hard-hats).

3.2.4.7.3 Protective clothing should be hooded, full-body coverall type.

3.2.4.7.4 Durable water-proof gloves (plastic, latex, rubber, nitrile, etc.) selected for chemical compatibility of the glove material and the liquid materials to be handled. Cloth or leather gloves may also be worn for comfort, but are not to be worn alone when handling hazardous liquids.

3.2.4.8 Additional Clothing Requirements: The Contractor will observe the following additional work clothing requirements:

3.2.4.8.1 Street clothes may not be worn under protective clothing into a regulated work area.

3.2.4.8.2 Any non-decontaminated protective clothing must remain within the contaminated areas, and will be disposed of as asbestos-contaminated waste upon completion of its use.

3.2.4.8.3 Provide authorized visitors with disposable sets of protective full-body clothing including footwear, as needed.

3.2.4.8.4 Provide eye protection and hard hats as required for job conditions or by applicable safety regulations. Where negative pressure respirators are worn, they are to be full-faced, unless the Contractor also provides protective eye wear.

3.2.4.8.5 All clothing must be sealable by design and/or by securing with tape at the workers' ankles and wrists. Short pants or short sleeve shirts will not be allowed for primary clothing in the work area.

3.2.4.9 Personal Exposure Monitoring: It is the Contractor's responsibility to conduct required personal exposure monitoring. Such exposure monitoring must be in full compliance with the requirements of 8 CCR §1529, et. seq. and 8 CCR §5144, et. seq. The Contractor will monitor the airborne asbestos exposures of not less than 10% of the work crew, or a minimum of two (2) workers, whichever is greater. Workers will be monitored in "worst case scenario" tasks, as well as those conducting less hazardous work. Personal exposure monitoring is not the responsibility of the County, nor of the Project IH Consultant, however, the Project IH Consultant may elect to conduct such monitoring as a supplemental or quality assurance measure. Personal exposure monitoring conducted by the Project IH Consultant is not to be construed as a substitute for, nor in any way to obviate, the Contractor's duty to conduct such monitoring. Personal exposure monitoring for asbestos will be conducted and analyzed in accordance with NIOSH Method 7400. Analytical results of Contractor's personal exposure monitoring must be posted daily at the work site, and copies of the analyses are to be submitted to the County along with the Post-Job Submittals.

3.2.5 Waste Management And Disposal

3.2.5.1 General: The Contractor is responsible for the safe handling, packaging, labeling, storage and transportation of all asbestos-containing waste (hazardous and non-hazardous) generated by the Work. By commencing this work, the Contractor implicitly agrees to bear all costs arising from any claims, damages, losses, and/or clean-up expenses incurred which as a result of the Contractor's negligence result from an asbestos release(s) on the job-site or while asbestos waste is in transport to a waste disposal facility. The Contractor and/or its designated subcontract waste hauler will deliver all asbestos-containing waste materials to an appropriately designated

waste disposal facility that has been accepted by the County and which is permitted in accordance with applicable regulations.

3.2.5.2 Storage Facilities: The Contractor will assure that all asbestos-containing wastes (hazardous and non-hazardous) generated by the Work are stored in a secured manner until received at the waste disposal facility. Debris bins, storage enclosures, etc. must be locked overnight, and whenever the Contractor is off-site or unable to directly monitor their contents and management. The Contractor will ensure that the appropriate and required warning signs are posted on waste storage locations. The Contractor will be responsible to maintain the waste storage facilities in an orderly and well-kept condition at all times. The Contractor will conduct routine waste storage area inspections to assure that appropriate storage conditions are maintained. Waste is not to be co-mingled with stored non-waste material or equipment.

3.2.5.3 Off-site Shipment of Wastes: The Contractor will notify the County and the Project IH Consultant in advance, whenever asbestos-containing waste materials are to be removed from the Project site. A copy of the Uniform Hazardous Waste Manifest or any other documents required by State or Local agencies shall be completed by the Contractor and submitted to the Project IH Consultant for review and signature prior to transporting asbestos-containing waste materials to a disposal facility. The Contractor shall provide sufficient advance notice of the need to obtain manifest signatures, so as to not delay waste shipment or otherwise impede the Project Schedule. The Project IH Consultant shall have authority to sign or approve waste shipping documents on behalf of the County. It shall be the Contractor's responsibility to obtain the necessary authorized signature(s) to ship wastes off-site. Delays or expenses resulting from the untimely coordination of waste shipment documentation shall be borne by the Contractor.

3.2.5.4 Waste Shipment Documentation: EPA Uniform Hazardous Waste Manifest forms will be used for all waste transported off-site for hazardous waste disposal. An asbestos non-hazardous waste tracking manifest will be used for all asbestos-containing waste transported off-site for disposal as non-hazardous waste. The Contractor will submit original "Generator" copies of all hazardous and non-hazardous waste manifests to the Project IH Consultant at the time the waste is transported off-site for disposal. All waste tracking documentation must meet the requirements of BAAQMD Regulation 11, Rule 2 (sections 11-2-304.6 and 11-2-502). All waste loads removed from the Project Site shall either be weighed by a Certified Weigh master prior to delivery to the disposal facility or at the disposal facility. Weight tickets shall be submitted by the Contractor as a part of the Contractor's Post-Job Submittals. At the conclusion of the Work, the Contractor shall provide documentation that the asbestos-containing waste materials were disposed of at an appropriate EPA-approved waste disposal facility. The documentation shall be submitted as part of the Contractor's Post-Job Submittals.

3.2.5.5 Shipment Containers: All waste shipping containers shall be individually labeled with appropriate signage and warnings, as required by applicable regulations, codes and ordinances. All waste hauling vehicles and/or waste debris bins shall, at all times, be enclosed and sealed while in route to the disposal facility.

3.2.5.6 Non-friable Debris Disposal: Resilient floor tiles, roofing materials and other non-friable asbestos-containing materials will not be required to be disposed of as hazardous waste, unless they are made friable during the removal process (see

Definitions for description of friability.) Friability will be determined by the Project IH Consultant or by a representative of a regulatory agency.

3.2.6 Work Area Clearance Criteria

3.2.6.1 General: The Contractor is not to de-mobilize from any Work Area until both the visual clearance criteria and the air monitoring clearance criteria have been met and documented, as described herein.

3.2.6.2 Post-Abatement Work Area Inspections: Subsequent to the completion of the cleaning phases and waste load-out, the Contractor's Supervisor, accompanied by the Project IH Consultant, will conduct a detailed Post-Abatement Work Area Inspection (visual inspection) to assure that the identified asbestos has been removed and that the Work Area has been adequately cleaned. The concurrence of the Project IH Consultant is required to conclude that a Work Area has undergone adequate cleaning to proceed with clearance air testing if necessary. This Post-Abatement Work Area inspection will be conducted for each regulated Work Area and each individual inspection is to be documented in writing. Such documentation will be signed by the individuals conducting the inspections. A copy of each such documentation will be provided to the Project IH Consultant for conveyance to the County.

3.2.6.3 Visual Clearance Criteria: A Work Area will be considered to be adequately cleaned when no visible and no three-dimensional remnant of the ACCM or ACM can be seen or felt. This determination will be made by the Project IH Consultant on a case-by-case basis.

3.2.6.4 Air Clearance Testing: Once a Work Area has successfully achieved the Visual Clearance Criteria; has been encapsulated; and the encapsulant has been allowed to adequately dry, the Project IH Consultant, at their discretion, may choose to conduct Air Clearance Testing to evaluate the Work Area's cleanliness and suitability for unprotected human re-occupancy. Clearance air sampling will be conducted in general accordance with AHERA protocols (40 CFR 763 Subpart E) for analysis by Transmission Electron Microscopy (TEM), although other TEM analytical methods (e.g. Yamate II) may be employed at the discretion of the Project IH Consultant. Unless otherwise specified, air sample collection will be conducted by aggressively disturbing the air prior to and during the clearance air sample collection period. At the discretion of the Project IH Consultant, some Work Areas may be evaluated by Air Clearance Testing using PCM in accordance with the NIOSH 7400 Method. Clearance air samples will not be collected outside the work area for comparison purposes. Satisfaction of the Air Clearance Criteria will be based solely the analytical results obtained from clearance air testing conducted within a regulated Work Area.

3.2.6.5 Air Clearance Criteria: A Work Area will be judged to be adequately cleaned and suitable for unprotected human re-occupancy when the asbestos structure concentration of each of the air samples collected within the Work Area, as analyzed by TEM, is reported to be less than 70 s/mm^2 of sample filter media. In Work Areas where Air Clearance Testing is conducted for analysis by PCM, a Work Area will be judged to be adequately cleaned and suitable for unprotected human re-occupancy when each sample collected within the Work Area is reported to be less than 0.010 fibers per cubic centimeter of air sampled (<0.01 f/cc).

3.2.6.6 Failure to Achieve Clearance Criteria: Should the Contractor fail to achieve either the Visual Clearance Criteria or the Air Clearance Criteria within a Work Area, the

Contractor will repeat a thorough re-cleaning of the entire Work Area. Following completion of the re-cleaning, the visual Post-Abatement Work Area Inspection will be repeated and documented again. Once the re-cleaned Work Area has successfully achieved the Visual Clearance Criteria, the Project IH Consultant will repeat the Air Clearance Testing. This pattern will be repeated until both Visual Clearance Criteria and Air Clearance Criteria have been achieved in the Work Area. All costs associated to the initial re-cleaning, and any subsequent re-cleaning, re-inspection, and/or re-sampling and analyses, will be borne by the Contractor as re-work.

END OF SECTION

ATTACHMENT – A

CERTIFICATE OF ASBESTOS WORKER'S ACKNOWLEDGEMENT

Project Name: _____

Date: _____

Project Address: _____

Contractor's Name: _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner of the above project requires that: You must be supplied with the proper respirator and be trained with its use. You must be trained in safe work practices and in the use of the equipment found on the job. You must receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type of respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal area protective measures. The topics covered in the course must have included the following:

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of protective equipment
- Pressure Differential Systems
- Work practices including hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray.

By signing this document, you are acknowledging that you have been advised of your rights, as pertain to training and protection, and of the worker protection requirements applicable to your employer, the Contractor.

Signature: _____

Social Security No.: _____

Printed: _____

Name: _____

Witness: _____

CERTIFICADO DE RECONOCIMIENTO POR PARTE DEL TRABAJODOR

NOMBRE DEL PROYECTO: _____

FECHA: _____

DIRECCION DEL PROYECTO: _____

NOMBRE DEL CONTRATISTA: _____

TRABAJAR CON ASBESTO PUEDE SER PELIGROSO. EL ASPIRAR DE FIBRAS DE ASBESTO HA SIDO LIGADO CON VARIOS TIPOS DE CANCER. SI UD. FUMA Y ASPIRA FIBRAS DE ASBESTO, LAS POSIBILIDADES QUE UD. SUFRIRA DE CANCER SON MAYORES QUE PARA LA PERSONA QUE NO FUMA.

El contrato entre su patron y el dueno para el proyecto antes citado requiere que le proveen a Ud. un repirador adecuado, y que a Ud. lo entrenen en su uso; que le entrenen a Ud. en praticas de seguridad en la obra y en el uso del equipo que se encuentre en la obra; que Ud. reciba un examen medico, y que todo esto se haga sin costo para Ud.

PROTECCION RESPIRATORIA: Ud. tiene que haber sido entrenado en el uso correcto de respiradores, y informado acerca del tipo de respirador que se usara en la obra citada. Deberan entregarle a Ud. una copia escrita del manual de proteccion respiratoria, expedida por su patron. Ud. tiene que ser equipado, sin costo alguno, con el respirador que se usara en la obra citada.

CURSO DE ENTRENAMIENTO: Ud. tiene que haber sido entrenado en los peligros inherentes en el manejo de asbesto y en el aspirar polvo de asbesto, asi como en los procedimientos correctos en el trabajo y las medidas de proteccion para el individuo y para la zona. Las materias tratadas en el curso deberan haber includido las sigientes:

- Caracteristicas fisicas del asbesto
- Peligros a la salud asociados con el asbesto
- Proteccion repiratoria
- El uso de equipo de proteccion
- Sistemas de Presion Diferencial
- Praticas del trabajo, incluyendo experiencias en actividades reales del trabajo
- Procedimientos para la decontaminacion personal
- Revision del aire ambiental en una area y para el individuo

EXAMEN MEDICO: Usted debe haber tenido un examen médico en el plazo de los últimos 12 meses sin coste a usted. Esta examinación debe haber incluido: la historia de la salud, pruebas de función pulmonares, y pudo haber incluido una evaluación de una radiografía del pecho.

Firmando este documento usted está reconociendo que le han aconsejado de las sus derechas, como pertenece al entrenamiento y a la protección, y de los requisitos de la protección del trabajador aplicables a su patrón, el contratista.

Firma: _____

Numero de Su Seguro social: _____

Su nombre, en letras de molde: _____

Testigo: _____

ATTACHMENT - B

CERTIFICATE OF COMPETENT PERSON ACKNOWLEDGMENT

The Cal/OSHA Construction Safety Orders for asbestos-related work (8 CCR, §1529, et. seq.) outlines specific duties and qualifications of the "Competent Person." An overview of these qualifications and responsibilities are summarized below.

The competent person must be authorized by his or her employer to take prompt corrective measures to eliminate hazards on the job and protect workers' safety.

The competent person must be capable of:

- Identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees.
- Identifying existing asbestos hazards in the work place and selecting the appropriate control strategy for asbestos exposure.

The duties of the competent person include, but are not limited to:

- Frequent and regular inspections of the job site, materials, and equipment.
- Supervise or perform the set-up of the regulated area and/or containment.
- Ensure the integrity of the regulated area and/or containment.
- Set up procedures to control entry to and exit from the regulated area and/or containment.
- Supervise all employee exposure monitoring and assure it is conducted according to regulatory requirements.
- Ensure the employees working within the regulated area(s) wear respirators and protective clothing as required by regulation.
- Ensure that employees working set up, use, and remove engineering controls, and use work practices and personal protective equipment in compliance with the regulations.
- Ensure that employees use hygiene facilities and observe the decontamination procedures specified in the regulation.
- Ensure through continuing onsite surveillance that engineering controls are functioning properly and employees are using proper work practices.
- Ensure that notification requirements of the regulation are met.

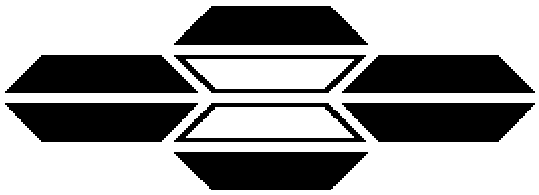
Additionally, the EPA requires the competent person to be trained in the Federal NESHAP regulations, the means to comply with them, and be on site during all removal operations.

I hereby certify that I have the authority to take prompt corrective measures to eliminate hazards on the job and protect workers' safety. Furthermore, I certify that I have read and understand my duties as outlined above and under the applicable regulations, and that I will exercise them to the best of my ability.

Employer: _____

_____ _____
Signature of Competent Person Date

_____
Printed Name of Competent Person



ASBESTOS TEM LABORATORIES, INC.

EPA Interim Method
Polarized Light Microscopy
Analytical Report

Laboratory Job # 371621

3431 Ettie St.
Oakland, CA 94608
(510) 704-8930
FAX (510) 704-8429
www.asbestostemlabs.com

With Branch Offices Located At:
1350 FREEPORT BLVD. UNIT 104, SPARKS, NV 89431
Ph. (775) 359-3377

ASBESTOS TEM LABORATORIES, INC

CA DPH ELAP
Lab No. 1866

NVLAP Lab Code: 101891-0
Oakland, CA

Dec-14-20

Steff Steiner
Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

RE: LABORATORY JOB # 371621
Polarized light microscopy analytical results for 12 bulk sample(s).
Job Site: County of Alameda Camp Sweeney Administration Building Roof
Job No.: R1207B05

Enclosed please find the bulk material analytical results for one or more samples submitted for asbestos analysis. The analyses were performed in accordance with EPA Method 600/R-93/116 or 600/M4-82-020 for the determination of asbestos in bulk building materials by polarized light microscopy (PLM). Please note that while PLM analysis is commonly performed on non-friable and fine grained materials such as floor tiles and dust, the EPA method recognizes that PLM is subject to limitations. In these situations, accurate results may only be obtainable through the use of more sophisticated and accurate techniques such as transmission electron microscopy (TEM) or X-ray diffraction (XRD).

Prior to analysis, samples are logged-in and all data pertinent to the sample recorded. The samples are checked for damage or disruption of any chain-of-custody seals. A unique laboratory ID number is assigned to each sample. A hard copy log-in sheet containing all pertinent information concerning the sample is generated. This and all other relevant paper work are kept with the sample throughout the analytical procedures to assure proper analysis.

Each sample is opened in a class 100 HEPA negative air hood. A representative sampling of the material is selected and placed onto a glass microscope slide containing a drop of refractive index oil. The glass slide is placed under a polarizing light microscope where standard mineralogical techniques are used to analyze and quantify the various materials present, including asbestos. The data is then compiled into a standard report format and reviewed by the authorized signatory before being released to the client.

Sincerely Yours,

Lab Manager
ASBESTOS TEM LABORATORIES, INC.

Disclaimer - These results relate only to the samples tested as received and must not be reproduced, except in full, with the approval of the laboratory. Incorrect or illegible information supplied by the customer may adversely affect the validity of test results. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Note: Test samples will be stored for three months after data of receipt, after which they will be properly disposed unless client makes other arrangements with the laboratory.

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 12
Reg. Samples Analyzed: 12
Split Layers Analyzed: 0

Report No. **371621**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda Camp Sweeney Administration Building Roof R1207B05

SAMPLE ID	ASBESTOS %	ASBESTOS TYPE	OTHER DATA (1) Non-Asbestos Fibers (2) Matrix Materials (3) Date/Time Collected (4) Date Analyzed	DESCRIPTION FIELD / LAB
S2-01A	**1-5%**	**Chrysotile**	1) 10-20% Fiberglass 2) 75-89% Tar, Qtz, Calc	Asphalt Sheeting Main Roof Field North
Lab ID # 1434-04730-001			3) Dec-10-20 4) Dec-14-20	Shingle-Black
S2-01B		**None Detected**	1) 15-30% Fiberglass,Cellulose 2) 70-85% Tar, Calc	Asphalt Sheeting Main Roof Field Central
Lab ID # 1434-04730-002			3) Dec-10-20 4) Dec-14-20	Shingle-Black
S2-01C	**1-5%**	**Chrysotile**	1) 10-20% Fiberglass 2) 75-89% Tar, Qtz, Calc	Asphalt Sheeting Main Roof Field South
Lab ID # 1434-04730-003			3) Dec-10-20 4) Dec-14-20	Shingle-Black
S2-02A	**1-5%**	**Chrysotile**	1) 10-20% Fiberglass 2) 75-89% Tar, Other m.p.	Gray Patch - Main Roof Field North
Lab ID # 1434-04730-004			3) Dec-10-20 4) Dec-14-20	Patching-Grey
S2-02B	**1-5%**	**Chrysotile**	1) None Detected 2) 95-99% Tar, Other m.p.	Gray Patch - Main Roof Field Central
Lab ID # 1434-04730-005			3) Dec-10-20 4) Dec-14-20	Patching-Grey
S2-02C		**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p.	Gray Patch - Main Roof Field South
Lab ID # 1434-04730-006			3) Dec-10-20 4) Dec-14-20	Patching-Silver
S2-03A		**None Detected**	1) 1-5% Cellulose 2) 95-99% Tar, Other m.p.	Black Patch - Main Roof Field North
Lab ID # 1434-04730-007			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S2-03B		**None Detected**	1) 1-5% Cellulose 2) 95-99% Tar, Other m.p.	Black Patch - Main Roof Field Central
Lab ID # 1434-04730-008			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S2-03C	**1-5%**	**Chrysotile**	1) None Detected 2) 95-99% Opq, Other m.p.	Black Patch - Main Roof Vent East
Lab ID # 1434-04730-009			3) Dec-10-20 4) Dec-14-20	Sealant-Grey
S2-04A		**None Detected**	1) None Detected 2) 99-100% Tar, Qtz, Calc	Beige Patch with Aggregate - Main Roof Field East Side
Lab ID # 1434-04730-010			3) Dec-10-20 4) Dec-14-20	Asphalt-Black

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Bingman

ASBESTOS TEM LABORATORIES, INC. **3431 Ettie St., Oakland, CA 94608** **(510) 704-8930**
www.asbestostemlabs.com *With Offices in Reno, NV (775) 359-3377*

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 12
Reg. Samples Analyzed: 12
Split Layers Analyzed: 0

Report No. **371621**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda Camp Sweeney Administration Building Roof R1207B05

SAMPLE ID	ASBESTOS % TYPE	OTHER DATA 1) Non-Asbestos Fibers 2) Matrix Materials 3) Date/Time Collected 4) Date Analyzed	DESCRIPTION FIELD / LAB
S2-04B	**None Detected**	1) None Detected 2) 99-100% Tar, Qtz, Calc	Beige Patch with Aggregate - Main Roof Field East Side
Lab ID # 1434-04730-011		3) Dec-10-20 4) Dec-14-20	Asphalt-Black
S2-04C	**None Detected**	1) None Detected 2) 99-100% Tar, Qtz, Calc	Beige Patch with Aggregate - Main Roof Field East Side
Lab ID # 1434-04730-012		3) Dec-10-20 4) Dec-14-20	Asphalt-Black
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Bingman

37102

Terracon

E-MAIL REPORT TO: SEE BELOW PROJECT MANAGER (PM)

☒ PM – S. Steiner spsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com	☐ PM – K. Pilgrim kmpilgrim@terracon.com
☐ PM- M. Benefield msbenefield@terracon.com	☐ PM – T. Kattchee takattchee@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com
☐ PM- D. Block David.block@terracon.com	☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (400-point)

Roof Sampling

Project Name/ Address/ Building No. County of Alameda – Camp Sweeney 2600 Fairmont Drive, San Leandro, CA Camp Sweeney Bldg. 2

Project# R1207B05 **Sampled By:** R. Caldwell **Sampling Date:** 12/10/20

Sample(s) sent to: ☐ MAL ☒ ASB TEM ☐ EMLAB ☐ Other

TAT ☐ Rush ☐ 24HRS ☒ 48HR ☐ 3-5 days

HM# S1-01	Material Description: Asphalt Main Roof Field	
Sample ID	**Sample Location & Material Location** Sheathing	**Quantity:**
01A	Main Roof Field North	
01B	Main Roof Field Central	
01C	Main Roof Field South	
HM# S2-02	**Material Description:** Gray Patch	
Sample ID	**Sample Location & Material Location**	**Quantity:**
02A	Main Roof Field North	
02B	Main Roof Field Central	
02C	Main Roof Field South	
HM# S3-03	**Material Description:** Black Patch	
Sample ID	**Sample Location & Material Location**	**Quantity:**
03A	Main Roof Field North	
03B	Main Roof Field Central	
03C	Main Roof Vent East	
HM# S4-04	**Material Description:** Beige Patch with Aggregate	
Sample ID	**Sample Location & Material Location**	**Quantity:**
04A	Main Roof Field East Side	
04B	Main Roof Field East Side	
04C	Main Roof Field East Side	
HM#	**Material Description:**	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	John Alexander	**Signature:**		**Date/Time:**	12/10/20
Received By:	MB	**Signature:**		**Date/ Time:**	DEC 10 '20 3:06PM
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

Project Name: County of Alameda - Camp Sweeney Roof Sampling
2600 Fairmont Drive, San Leandro, CA

Project # R1207B05

Date: 12/10/20

Drawn By: J. Alexander

C. Remove dutch syle gutter by cutting back fascia board so that it is level with roof edge. Fill current drain outlets. Hang new external gutters using 22 gauge pre-formed R-Mer Edge gutters and connect to existing downspouts where old drain outlets were located.

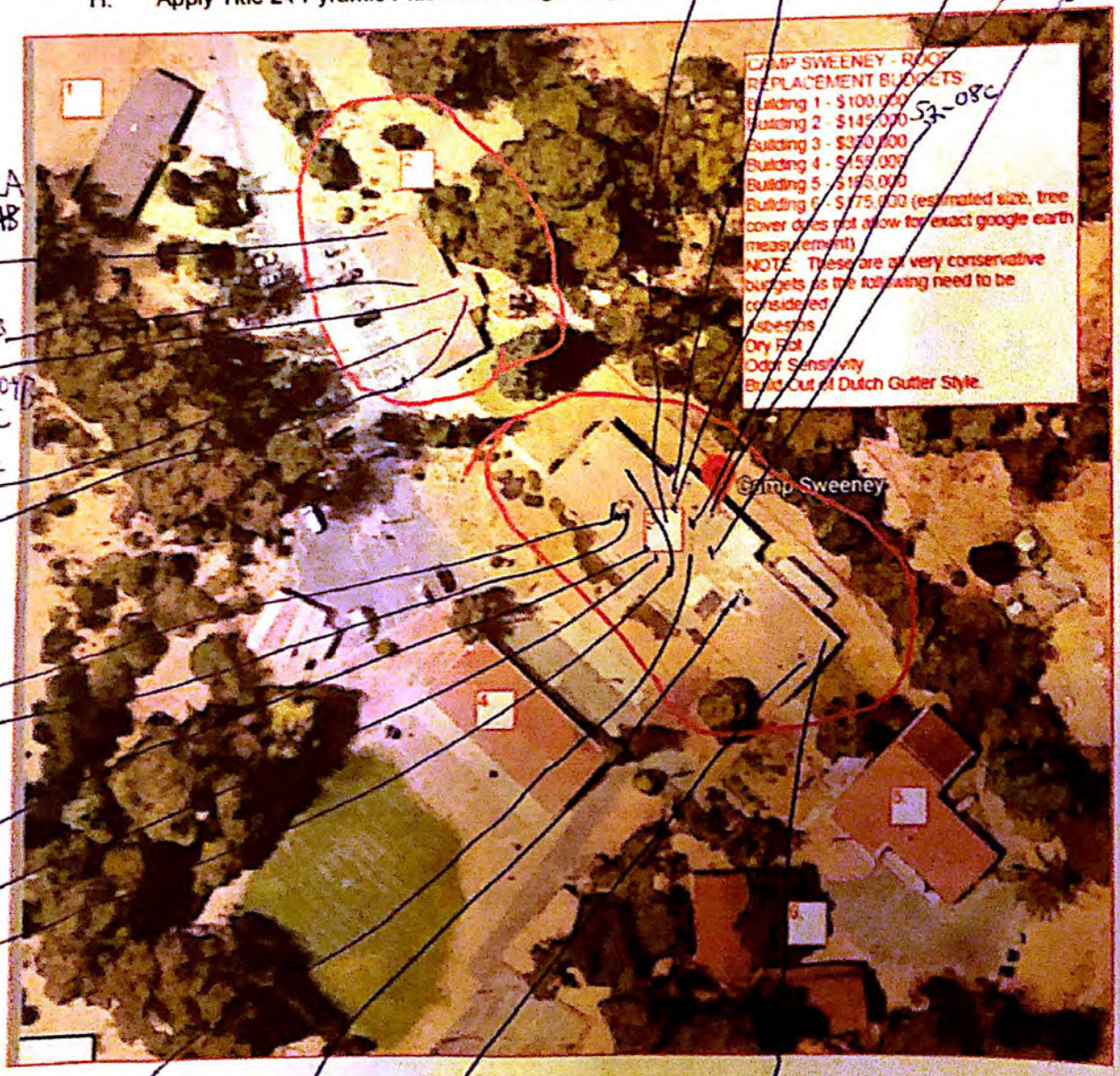
D. Mechanically fasten 1/2" Densdeck Prime board per wind uplift calculation provided by manufacturer.

E. Prime coverboard with ½ gallon SA Primer per 100 square feet.

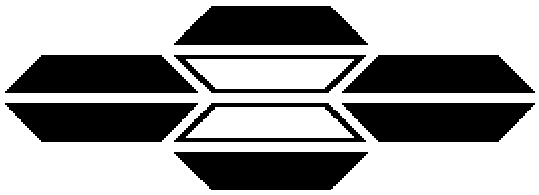
F. Adhere HPR SA Base Sheet.

G. Adhere StressPly SA FR Mineral Cap Sheet.

H. Apply Title 24 Pyramic Plus LO coating at 3 gallons per 100 square feet.



Sample Location Map



ASBESTOS TEM LABORATORIES, INC.

EPA Interim Method
Polarized Light Microscopy
Analytical Report

Laboratory Job # 371603

3431 Ettie St.
Oakland, CA 94608
(510) 704-8930
FAX (510) 704-8429
www.asbestostemlabs.com

With Branch Offices Located At:
1350 FREEPORT BLVD. UNIT 104, SPARKS, NV 89431
Ph. (775) 359-3377

ASBESTOS TEM LABORATORIES, INC

CA DPH ELAP
Lab No. 1866

NVLAP Lab Code: 101891-0
Oakland, CA

Dec-14-20

Steff Steiner
Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

RE: LABORATORY JOB # 371603
Polarized light microscopy analytical results for 24 bulk sample(s) with 8 sample split(s)
Job Site: County of Alameda - Camp Sweeney Dormitory Roof Sampling
Job No.: R1207B05

Enclosed please find the bulk material analytical results for one or more samples submitted for asbestos analysis. The analyses were performed in accordance with EPA Method 600/R-93/116 or 600/M4-82-020 for the determination of asbestos in bulk building materials by polarized light microscopy (PLM). Please note that while PLM analysis is commonly performed on non-friable and fine grained materials such as floor tiles and dust, the EPA method recognizes that PLM is subject to limitations. In these situations, accurate results may only be obtainable through the use of more sophisticated and accurate techniques such as transmission electron microscopy (TEM) or X-ray diffraction (XRD).

Prior to analysis, samples are logged-in and all data pertinent to the sample recorded. The samples are checked for damage or disruption of any chain-of-custody seals. A unique laboratory ID number is assigned to each sample. A hard copy log-in sheet containing all pertinent information concerning the sample is generated. This and all other relevant paper work are kept with the sample throughout the analytical procedures to assure proper analysis.

Each sample is opened in a class 100 HEPA negative air hood. A representative sampling of the material is selected and placed onto a glass microscope slide containing a drop of refractive index oil. The glass slide is placed under a polarizing light microscope where standard mineralogical techniques are used to analyze and quantify the various materials present, including asbestos. The data is then compiled into a standard report format and reviewed by the authorized signatory before being released to the client.

Sincerely Yours,

Lab Manager
ASBESTOS TEM LABORATORIES, INC.

Disclaimer - These results relate only to the samples tested as received and must not be reproduced, except in full, with the approval of the laboratory. Incorrect or illegible information supplied by the customer may adversely affect the validity of test results. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Note: Test samples will be stored for three months after data of receipt, after which they will be properly disposed unless client makes other arrangements with the laboratory.

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 24
Reg. Samples Analyzed: 24
Split Layers Analyzed: 8

Report No. **371603**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda - Camp Sweeney Dormitory Roof Sampling
R1207B05

SAMPLE ID	ASBESTOS %	ASBESTOS TYPE	OTHER DATA (1) Non-Asbestos Fibers (2) Matrix Materials (3) Date/Time Collected (4) Date Analyzed	DESCRIPTION FIELD / LAB
S3-01A		**None Detected**	**1)** 20-30% Fiberglass **2)** 70-80% Tar, Qtz, Calc	Asphalt Sheet Main Roof Field - Main Roof South
Lab ID # 1434-04720-001			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-01B		**None Detected**	**1)** 20-30% Fiberglass **2)** 70-80% Tar, Qtz, Calc	Asphalt Sheet Main Roof Field - Main Roof Central
Lab ID # 1434-04720-002			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-01C		**None Detected**	**1)** 20-30% Fiberglass **2)** 70-80% Tar, Qtz, Calc	Asphalt Sheet Main Roof Field - Main Roof North
Lab ID # 1434-04720-003			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-02A		**None Detected**	**1)** 20-30% Fiberglass **2)** 70-80% Tar, Qtz, Calc	Curb Asphalt Sheeting - Main Roof South Skylight
Lab ID # 1434-04720-004			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-02B		**None Detected**	**1)** 5-10% Fiberglass **2)** 90-95% Tar, Qtz, Calc	Curb Asphalt Sheeting - Main Roof South Central Skylight
Lab ID # 1434-04720-005			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-02C		**None Detected**	**1)** 5-10% Fiberglass **2)** 90-95% Tar, Qtz, Calc	Curb Asphalt Sheeting - Main Roof North HVAC
Lab ID # 1434-04720-006			**3)** Dec-10-20 **4)** Dec-14-20	Shingle-Black
S3-03A		**None Detected**	**1)** 5-10% Cellulose **2)** 90-95% Tar, Other m.p.	Beige Mastic - Main Roof South Skylight
Lab ID # 1434-04720-007A			**3)** Dec-10-20 **4)** Dec-14-20	Mastic-Black
S3-03A		**None Detected**	**1)** None Detected **2)** 99-100% Opq, Other m.p.	Beige Mastic - Main Roof South Skylight
Lab ID # 1434-04720-007B			**3)** **4)** Dec-14-20	Coating-White
S3-03B		**None Detected**	**1)** 5-10% Cellulose **2)** 90-95% Tar, Other m.p.	Beige Mastic - Main Roof South Central Skylight
Lab ID # 1434-04720-008A			**3)** Dec-10-20 **4)** Dec-14-20	Mastic-Black
S3-03B		**None Detected**	**1)** None Detected **2)** 99-100% Opq, Other m.p.	Beige Mastic - Main Roof South Central Skylight
Lab ID # 1434-04720-008B			**3)** **4)** Dec-14-20	Coating-White

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Bingman

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 24
Reg. Samples Analyzed: 24
Split Layers Analyzed: 8

Report No. **371603**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda - Camp Sweeney Dormitory Roof Sampling
R1207B05

SAMPLE ID	ASBESTOS %	ASBESTOS TYPE	OTHER DATA (1) Non-Asbestos Fibers (2) Matrix Materials (3) Date/Time Collected (4) Date Analyzed	DESCRIPTION FIELD / LAB
S3-03C		**None Detected**	1) 5-10% Cellulose 2) 90-95% Tar, Other m.p.	Beige Mastic - Main Roof North HVAC
Lab ID # 1434-04720-009A			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S3-03C		**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p.	Beige Mastic - Main Roof North HVAC
Lab ID # 1434-04720-009B			3) 4) Dec-14-20	Coating-White
S3-04A		**None Detected**	1) 5-10% Cellulose 2) 90-95% Tar, Other m.p.	Gray Mastic on Skylight Metal Frame - Main Roof South Skylight Metal Cap
Lab ID # 1434-04720-010A			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S3-04A		**None Detected**	1) None Detected 2) 99-100% Calc, Other m.p.	Gray Mastic on Skylight Metal Frame - Main Roof South Skylight Metal Cap
Lab ID # 1434-04720-010B			3) 4) Dec-14-20	Coating-White
S3-04B		**None Detected**	1) 5-10% Cellulose 2) 90-95% Tar, Other m.p.	Gray Mastic on Skylight Metal Frame - Main Roof South Central Skylight Metal Cap
Lab ID # 1434-04720-011A			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S3-04B		**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p.	Gray Mastic on Skylight Metal Frame - Main Roof South Central Skylight Metal Cap
Lab ID # 1434-04720-011B			3) 4) Dec-14-20	Coating-White
S3-04C	**1-5%**	**Chrysotile**	1) None Detected 2) 95-99% Tar, Other m.p.	Gray Mastic on Skylight Metal Frame - Main Roof North Central Skylight
Lab ID # 1434-04720-012			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S3-05A		**None Detected**	1) 5-10% Cellulose 2) 90-95% Tar, Other m.p.	Black Mastic - Main Roof at Pipe Penetration South End
Lab ID # 1434-04720-013			3) Dec-10-20 4) Dec-14-20	Mastic-Black
S3-05B		**None Detected**	1) 5-10% Fiberglass 2) 90-95% Tar, Qtz, Calc	Black Mastic - Main Roof at Field South Central
Lab ID # 1434-04720-014			3) Dec-10-20 4) Dec-14-20	Shingle-Black
S3-05C		**None Detected**	1) 6-15% Cellulose,Fiberglass 2) 85-94% Tar, Other m.p.	Black Mastic - Main Roof at Field at Northeast Perimeter
Lab ID # 1434-04720-015			3) Dec-10-20 4) Dec-14-20	Mastic-Black

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Bingman

ASBESTOS TEM LABORATORIES, INC. **3431 Ettie St., Oakland, CA 94608** **(510) 704-8930**
www.asbestostemlabs.com *With Offices in Reno, NV (775) 359-3377*

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 24
Reg. Samples Analyzed: 24
Split Layers Analyzed: 8

Report No. **371603**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda - Camp Sweeney Dormitory Roof Sampling
R1207B05

SAMPLE ID	ASBESTOS % TYPE	OTHER DATA 1) Non-Asbestos Fibers 2) Matrix Materials 3) Date/Time Collected 4) Date Analyzed	DESCRIPTION FIELD / LAB
S3-06A	**None Detected**	1) 1-5% Cellulose 2) 95-99% Tar, Qtz, Other m.p.	Light Gray Asphalt Main Roof Field - Main Roof Central East
Lab ID # 1434-04720-016		3) Dec-10-20 4) Dec-14-20	Asphalt-Grey
S3-06B	**None Detected**	1) 1-5% Cellulose 2) 95-99% Tar, Qtz, Other m.p.	Light Gray Asphalt Main Roof Field - Main Roof Central East
Lab ID # 1434-04720-017		3) Dec-10-20 4) Dec-14-20	Asphalt-Grey
S3-06C	**None Detected**	1) 1-5% Cellulose 2) 95-99% Tar, Qtz, Other m.p.	Light Gray Asphalt Main Roof Field - Main Roof Central East
Lab ID # 1434-04720-018		3) Dec-10-20 4) Dec-14-20	Asphalt-Grey
S3-07A	**None Detected**	1) None Detected 2) 99-100% Calc, Opq, Other m.p.	White Asphalt Main Roof Field - Main Roof Central West
Lab ID # 1434-04720-019A		3) Dec-10-20 4) Dec-14-20	Coating-White
S3-07A	**None Detected**	1) None Detected 2) 99-100% Tar	White Asphalt Main Roof Field - Main Roof Central West
Lab ID # 1434-04720-019B		3) 4) Dec-14-20	Mastic-Black
S3-07B	**None Detected**	1) None Detected 2) 99-100% Calc, Opq, Other m.p.	White Asphalt Main Roof Field - Main Roof Central West
Lab ID # 1434-04720-020A		3) Dec-10-20 4) Dec-14-20	Coating-White
S3-07B	**None Detected**	1) None Detected 2) 99-100% Tar	White Asphalt Main Roof Field - Main Roof Central West
Lab ID # 1434-04720-020B		3) 4) Dec-14-20	Mastic-Black
S3-07C	**None Detected**	1) None Detected 2) 99-100% Calc, Opq, Other m.p.	White Asphalt Main Roof Field - Main Roof Northeast
Lab ID # 1434-04720-021A		3) Dec-10-20 4) Dec-14-20	Coating-White
S3-07C	**None Detected**	1) 1-5% Fiberglass 2) 95-99% Tar, Qtz, Calc	White Asphalt Main Roof Field - Main Roof Northeast
Lab ID # 1434-04720-021B		3) 4) Dec-14-20	Asphalt-Black
S3-08A	**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p.	Gray Glazing for Metal Strip for Safety Glass - Main Roof Northeast Skylight
Lab ID # 1434-04720-022		3) Dec-10-20 4) Dec-14-20	Glazing-Grey

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Bingman

POLARIZED LIGHT MICROSCOPY
ANALYTICAL REPORT

EPA Method 600/R-93/116 or 600/M4-82-020

Contact: Steff Steiner

Address: Terracon Consultants, Inc.
1466 66th Street
Emeryville, CA 94608

Samples Indicated: 24
Reg. Samples Analyzed: 24
Split Layers Analyzed: 8

Report No. **371603**
Date Submitted: Dec-10-20
Date Reported: Dec-14-20

Job Site / No. County of Alameda - Camp Sweeney Dormitory Roof Sampling
R1207B05

SAMPLE ID	ASBESTOS % TYPE	OTHER DATA 1) Non-Asbestos Fibers 2) Matrix Materials 3) Date/Time Collected 4) Date Analyzed	DESCRIPTION FIELD LAB
S3-08B Lab ID # 1434-04720-023	**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p. 3) Dec-10-20 4) Dec-14-20	Gray Glazing for Metal Strip for Safety Glass - Main Roof Northeast Skylight Glazing-Grey
S3-08C Lab ID # 1434-04720-024	**None Detected**	1) None Detected 2) 99-100% Opq, Other m.p. 3) Dec-10-20 4) Dec-14-20	Gray Glazing for Metal Strip for Safety Glass - Main Roof Northeast Skylight Glazing-Grey
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
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Lab ID #		1) 2) 3) 4)	
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Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	
Lab ID #		1) 2) 3) 4)	

Detection Limit of Method is Estimated to be 1% Asbestos Using a Visual Area Estimation Technique

Analyst Ilana Dingman

371603

Terracon

E-MAIL REPORT TO: *SEE BELOW PROJECT MANAGER (PM)

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ACM BULK SAMPLE DATA SHEET

☑ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (400-point)

Project Name/ Address/ Building No. County of Alameda – Camp Sweeney Roof Sampling 26000 Fairmont Drive San Leandro, CA Camp Sweeney Bldg 3

Project# R120TB05 **Sampled By:** R Caldwell **Sampling Date:** 12/10/20

Sample(s) sent to: ☐ MAL ☐ ASB TEM ☐ EMLAB ☑ Other Asbestos TEM

TAT ☐ Rush ☐ 24HRS ☑ 48HR ☐ 3-5 days

HM# S3-01	**Material Description**	Asphalt Main Roof Field		
Sample ID	**Sample Location & Material Location**	Shot		**Quantity:**
01A	Main	Roof	South	
01B	Main	Roof	Central	
01C	Main	Roof	North	JA
HM# S3-02	**Material Description:**	Curb ~~Mastic~~ (Asphalt ~~Shingles~~		
Sample ID	**Sample Location & Material Location**	JA		**Quantity:** Sheeting
-02A	Main	Roof	South	Skylight
-02B	Main	Roof	South Central	Skylight
-02C	Main	Roof	North	HVAC
HM# S3-03	**Material Description:**	Beige Mastic		
Sample ID	**Sample Location & Material Location**			**Quantity:**
-03A	Main	Roof	South	Skylight ~~Metal Cap~~
-03B	Main	Roof	South Central	Skylight
-03C	Main	Roof	North	HVAC
HM# S3-04	**Material Description:**	Gray Mastic on	Skylight	Metal Frame
Sample ID	**Sample Location & Material Location**			**Quantity:**
-04A	Main	Roof	South	Skylight Metal Cap
-04B	Main	Roof	South Central	Skylight Metal Cap
-04C	Main	Roof	North Central	Skylight
HM# S3-05	**Material Description:**	Black Mastic		
Sample ID	**Sample Location & Material Location**			**Quantity:**
-05A	Main	Roof	at Pipe Penetration	South End
-05B	Main	Roof	at Field	South Central
-05C	Main	Roof	at Field	Northeast Perimeter

Relinquished By:	JJ Alexander	**Signature:**		**Date/Time:**	12/10/20
Received By:	MB	**Signature:**		**Date/ Time:**	RECD 12 3:45PM
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

371663

Terracon

E-MAIL REPORT TO: SEE BELOW PROJECT MANAGER (PM)

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ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (400-point)

Project Name/ Address/ Building No. County of Alameda – Camp Sweeney Roof Samples – Leandro, CA 2600 Fairmont Drive San Leandro Camp Sweeney Bldg. 3

Project# R1207B05 **Sampled By:** R. Caldwell **Sampling Date:** 12/10/20

Sample(s) sent to: ☐ MAL ☒ ASB TEM ☐ EMLAB ☐ Other

TAT ☐ Rush ☐ 24HRS ☒ 48HR ☐ 3-5 days

HM# S3-06	Material Description: Light Gray Asphalt Main Roof Field	
Sample ID	Sample Location & Material Location	Quantity:
06A	Main Roof Central East	
06B	Main Roof Central East	
06C	Main Roof Central East	

HM# S3-07	Material Description: White Asphalt Main Roof Field	
Sample ID	Sample Location & Material Location	Quantity:
07A	Main Roof Central West	
07B	Main Roof Central West	
07C	Main Roof ~~Central West~~ Northeast	

HM# S3-08	Material Description: Gray Glazing for metal Stop for Safety Glass	
Sample ID	Sample Location & Material Location	Quantity:
08A	Main Roof ~~North Central~~ East SKylight	
08B	Main Roof Northeast SKylight	
08C	Main Roof Northeast SKylight	

HM#	Material Description:	
Sample ID	Sample Location & Material Location	Quantity:

HM#	Material Description:	
Sample ID	Sample Location & Material Location	Quantity:

Relinquished By: J. Alexander MTB **Signature:** [signature] **Date/Time:** 12/10/20
Received By: [signature] **Signature:** [signature] **Date/ Time:** 12/10/20 3:45PM
Relinquished By: **Signature:** **Date/Time:**
Received By: **Signature:** **Date/Time:**

Project Name: County of Alameda - Camp Sweeney Roof Sampling
2600 Fairmont Drive, San Leandro, CA

Project # R1207B05

Date: 12/10/20

Drawn By: J. Alexander

C. Remove dutch syle gutter by cutting back fascia board so that it is level with roof edge. Fill current drain outlets. Hang new external gutters using 22 gauge pre-formed R-Mer Edge gutters and connect to existing downspouts where old drain outlets were located.

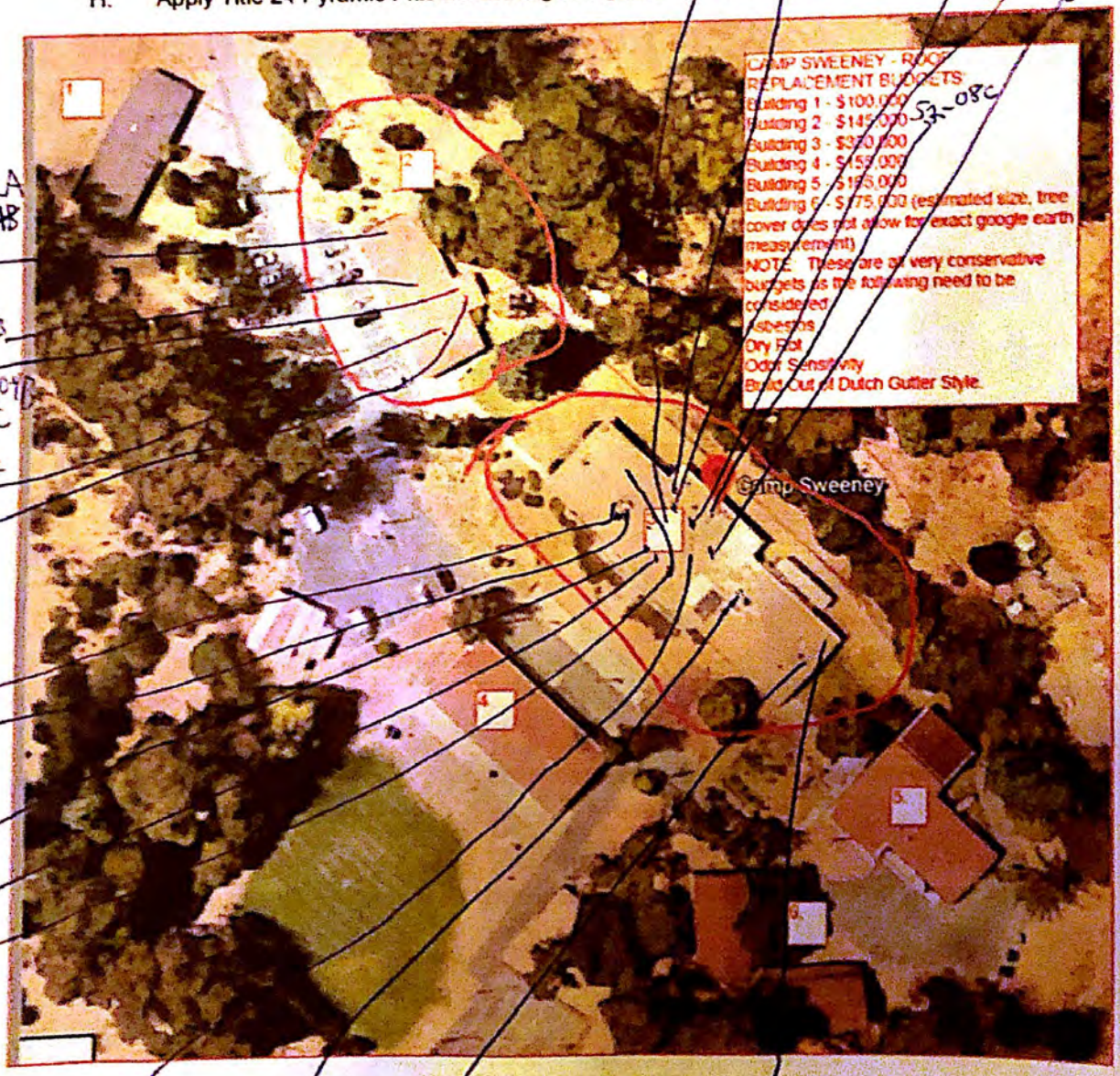
D. Mechanically fasten 1/2" Densdeck Prime board per wind uplift calculation provided by manufacturer.

E. Prime coverboard with ½ gallon SA Primer per 100 square feet.

F. Adhere HPR SA Base Sheet.

G. Adhere StressPly SA FR Mineral Cap Sheet.

H. Apply Title 24 Pyramic Plus LO coating at 3 gallons per 100 square feet.



Sample Location Map