

**SECTION 024119.13  
SELECTIVE BUILDING DEMOLITION  
(Roof Demolition)**

**PART I – GENERAL**

**1.01 SCOPE OF WORK:**

- A. Remove and dispose of existing roofing system, insulation and all associated base flashings and metal projection and perimeter flashings.
- B. Remove and dispose of plywood decking and deck framing that is found to have dry rot and that has been designated and approved by the District.
- C. Remove and dispose of plywood siding and underlayment paper that is adjacent to the shingle roofing system of building 1200 - and designated and approved by the District.
- D. Comply with owner recommendations for setup of debris removal boxes, chutes and dumpsters.
- E. Protect adjacent surfaces from damage during removal.
- F. Remove and dispose of existing rooftop equipment not in use. Check with the District to verify what equipment is to be removed.
- G. All hazardous waste shall be removed in accordance with all Local, State, Federal, and the District's requirements. Hazardous waste removal is not part of this section.

**1.02 REGULATIONS**

- A. Comply with all requirements as set forth in the 2010 California Building Code.
- B. Comply with section 5.408 of the California Building Code as it pertains to construction waste reduction, disposal and recycling.

**1.03 GENERAL:**

- A. During all phases of work, contractor shall comply with all applicable sections of the State of California Code of Regulation (CCR), Industrial Safety Orders (Title 8), as well as Federal and State of California Occupational Safety and Health Administration (OSHA) regulations, including the Hazardous Waste Operations and

Emergency Response Regulation (Title 8, Section 5192 and 29 CFR 1910.120).

- B. All project staging shall have the approval of the Owner's Representative.

## **PART 2 – PRODUCTS**

NONE

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION:**

- A. Survey existing conditions to determine extent of demolition required.
- B. Arrange operations to reveal concealed structural conditions for examination and verification before removal or demolition.
- C. Verify actual conditions to determine whether removal or demolition will result in structural deficiency, overloading, failure or unplanned collapse.
- D. Items to remain shall be protected against damage during the demolition operations.
- E. Demolish and remove existing construction only to the extent required by the new construction and as indicated.
- F. Perform selective demolition using methods which are least likely to damage work to remain and which provide proper surfaces for patching.
- G. Promptly remove all debris to avoid excessive loads on supporting walls, floors, and framing.
- H. Remove debris from Owner property on a daily basis to a legal disposal site.

### **3.02 UNIDENTIFIED MATERIALS:**

- A. If the contractor in the course of normal inspections identifies any unidentified items, including materials that may contain asbestos or any other potentially hazardous substances that will (or may) require additional demolition and removal other than as required by the this contract, the contractor shall immediately report to the project engineer.

- B. The Owner will arrange for necessary testing and analysis of unidentified materials and will provide instructions to the contractor regarding the removal, handling, storage, transport and disposal of the materials.

### **3.03 DUST CONTROL:**

- A. Accomplish demolition and removal with the minimum accumulation of dust and debris.
- B. Work shall proceed in such a manner as to minimize the spread of dust and flying debris.

### **3.04 PROTECTION:**

- A. Provide for the protection of persons passing around and through the area of demolition.
- B. Provide protective measures to ensure free and safe passage of persons to and from occupied areas.
- C. Execute demolition work in a manner that will ensure the safety of adjacent property and persons occupying such property against any damages or injuries which might occur from falling debris, unprotected excavations, holes, voids, etc. Airborne residue or other causes; and so as not to interfere with the use of adjacent public and private property of the free and safe passage to and from the same.
- D. Take all necessary precautions to prevent damage to any existing construction scheduled to remain, whether located on the site of on adjacent property.
- E. Protect existing walls, floors and other new or existing work including finishes from damage during the demolition process.
- F. Any item damaged or disturbed which was required to remain in place shall be replaced, repaired, or reset to the satisfaction of the Owner's Representative at no cost to the Owner.
- G. Contractor shall monitor weather predictions and cease work when rain or heavy fog is forecast.

### **3.05 DISPOSAL:**

- A. Disposal facilities shall be in compliance with all federal and state regulations. Applicable regional and local laws, rules and regulations

shall be those of the government or quasi-governmental agencies, or other entities having jurisdiction at the disposal facility.

- B. Disposal of any material as non-hazardous waste shall not relieve the contractor from complying with the requirements of the contract documents and the requirements of all federal, state, regional and local laws, rules, and regulations regarding the removal and transport of materials as specified.

### **3.06 CLEANUP:**

- A. Inspect existing surfaces or structures adjacent to demolition and removal operations, including surfaces or structures on adjacent public or private property for damage and stains. Repair or clean existing surfaces or structures not indicated to be removed including surfaces or structures on adjacent public or private property prior to the completion of the work at no additional cost.
- B. Keep the project site clear of all debris resulting from demolition and removals operations and remove all debris from the site on a daily basis during the progress of the work. The cost of removal, hauling, and dumping shall be borne by the contractor.

### **3.07 UTILITY SERVICES:**

- A. Maintain existing utilities, keep in service and protect against damage during demolition operations.
- B. Do not interrupt existing utilities servicing occupied or used facilities, except when authorized in writing by Owner's Representative. Provide temporary services during interruptions to existing utilities as acceptable to owner.

**END OF SECTION**

**LEAD ROOF ABATEMENT  
PROJECT SPECIFICATIONS**

**JAMES LICK HIGH SCHOOL  
57 NORTH WHITE ROAD  
SAN JOSÉ, CA 95127**

**ROOFS OF THE  
ADMINISTRATION BUILDING  
AND  
BUILDING 1200 – MAIN GYM**

**ESUHSD PROJECT # F40-030-811 JL ERP ROOFING  
BID # B-31-16-17**

**Prepared for:  
EAST SIDE UNION HIGH SCHOOL DISTRICT  
830 NORTH CAPITOL AVENUE  
SAN JOSÉ, CA 95133**

March 30, 2017

HMD Project # 17-056

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## **APPENDICES**

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**SECTION 02 83 00  
LEAD ABATEMENT**

**SUB-SECTION 01  
GENERAL LEAD REMOVAL SPECIFICATIONS**

**1.0 GENERAL**

**1.1 Description**

- A. This section consists of furnishing all work necessary to perform the removal, packaging, handling, transportation, and disposal of lead-containing materials and lead-contaminated materials located within the project limits. All work shall be performed in accordance with all federal, state, and local requirements and statutes.
- B. The work specified herein shall be the removal of lead-containing materials by persons knowledgeable, qualified, and trained in the removal, treatment, handling, packaging, transportation, and disposal of lead-containing materials, and the subsequent cleaning of the affected environment. These persons shall comply with all federal, state and local regulations and mandated work practices, and shall be capable of performing the work in the Contract.

**1.2 Scope of Work**

- A. General Requirements: Work of this section includes, but is not limited to, the following:
  - 1. See the attached appendix entitled Lead Abatement Scope of Work
  - 2. Providing dust control as required to protect the Contractor's employees, Owner Staff, visitors/guests, and passers-by from lead exposure. The lead concentration in the air outside of the lead work control area but inside of the work area (inside of the construction fence) shall not exceed 10 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The airborne lead concentration outside of the work area shall not exceed the background airborne lead concentration as tested by the HazMat Project Manager (HPM) prior to the commencement of any on-site activity.
  - 3. The work includes protecting the site (specifically the soil surrounding the building and landscaping), the building structure, facility, any and all furniture, fixtures, etc., from further lead contamination.
  - 4. The Contractor shall perform employee exposure monitoring as required by Cal-OSHA during the project
- B. The following precautions should be taken prior to initiating demolition activities involving any lead-containing material.
  - 1. The Contractor shall not perform any lead-related demolition activities until an initial exposure assessment has been performed and submitted to the Owner's Representative.
  - 2. The Contractor shall install lead dust control measures, lead waste and debris retention areas, worker protection, and decontamination areas in accordance with this Section, the Contractor's work plan, and lead exposure assessment data.
- C. Pre-Project Initial Exposure Assessment and Test Section: Prior to performing any lead-related demolition work, the Contractor shall perform an initial exposure assessment as described in 8 CCR 1532.1. The initial exposure assessment shall be performed through the preparation of "Lead-Related Construction Demolition Test Sections", if deemed necessary. The Test Section work shall be performed a minimum of two weeks prior to initiating lead-

related demolition work at the building. During work on the Test Section, all Supervisors/Competent Persons shall be certified as Lead-Related Construction Supervisors and all workers shall be certified as Lead-Related Construction Workers in accordance with 17 CCR, Division 1, Chapter 8.

- D. Lead-Related Demolition Scope of Work: The Contractor shall remove, package, transport, and properly dispose of the lead-containing and lead-contaminated items referred to in Appendix A for specific locations. Quantities shall be field verified.
- E. Where exterior lead containing material is encountered:
1. Remove or protect bushes and landscaping from the perimeter of the building out to 15 feet from the base of the buildings as required for soil protection. When necessary, cut the bushes and landscaping flush with the ground. Dispose of the bushes and landscaping as construction debris following removal.
  2. Remove, package, transport, and properly dispose of all lead-containing painted exterior components on the Buildings including but not limited to exterior wood cladding (siding), door components, window components, fascia boards and roof overhang components. Remove, package, transport, and properly dispose of the lead-containing window glazing located on the Buildings. Remove, package, transport, and properly dispose of all lead-containing painted interior doors in the Buildings. The Owner may have performed waste characterization sampling of these items. If not the contractor shall be responsible for the same. All work associated with the removal of the exterior components and interior doors shall be performed in accordance with this Section, the Contractor's lead-related demolition work plan, and the procedures utilized during the Test Section work.
  3. Remove, package, transport, and properly dispose of all lead-containing painted components located on the interior of Buildings. These components include, but are not limited to, gypsum wall and ceiling board systems, wood wallboard, wood base cove, and interior door frame components. The Owner may have performed waste characterization sampling of these items. If not the contractor shall be responsible for the same. All work associated with the removal of the exterior components and interior doors shall be performed in accordance with this Section, the Contractor's lead-related demolition work plan required by Article 1.08, and the procedures utilized during the Test Section work.
  4. The Owner has sampled the soil around the perimeter of the buildings. The Contractor is responsible for protecting the soil on the perimeter of the building from becoming contaminated with lead in excess of 350 ppm or established 'baseline' levels – which ever is lower. After completion of the lead-related demolition work the Owner will again sample the soil. The testing and analysis of the soil samples will require five to eight working days to complete. If the lead concentration in the soil exceeds 350 ppm, or established 'baseline' levels – which ever is lower, the Contractor shall perform the following work at no additional cost to the Owner.
    - a. The Contractor shall remove the top six inches of soil from the base of the building/ point of work to a minimum distance of ten feet from the point of work and extending out to the perimeter of the work area. The contractor shall perform the removal of the soil in two days or less.
    - b. The waste soil shall be packaged and placed into waste containers in accordance with the requirement of the waste transporter and disposal facility.
    - c. The contractor shall retain the HazMat Project Manager that was on-site during the lead-related demolition project to perform perimeter air monitoring.
    - d. At the completion of the soil removal project, the HazMat Project Manager will collect representative waste characterization samples of the soil waste. The soil waste samples will be evaluated for their conformance with the requirements of Title 22 and the requirements of the waste transporter and disposal facility.



- e. The testing and analysis of the soil waste characterization samples will require five to eight business days to complete. The Contractor shall leave the waste containers on the project site until receipt of the waste sample characterization sample results.

### **1.3 Related Work**

#### **SECTION 02 82 13 – ASBESTOS RELATED DEMOLITION WORK**

### **1.4 Required Licensure and Certification**

- A. Contractor shall be licensed by the State of California, Contractors State License Board (CSLB). The license shall be current and be maintained in current status throughout the duration of the project.
- B. Transportation of Lead-Containing Materials: Contractor shall be a registered hazardous waste transporter with State of California, Department of Toxic Substances Control. If the Contractor is not a registered hazardous waste transporter, the Contractor shall have a listed subcontractor that is a registered hazardous waste transporter with State of California, Department of Toxic Substances Control. Copies of the current, relevant registration certificate(s) shall be submitted as a part of the pre-job submittal.  
Throughout the duration of the project, all Supervisors/Competent Persons shall be certified as Lead-Related Construction Supervisors and all workers shall be certified as Lead-Related Construction Workers in accordance with 17 CCR, Division 1, Chapter 8.

### **1.5 Applicable Documents and Regulations**

- A. It is the responsibility of the Contractor to know the current regulations controlling work and to perform all project related work in accordance with such regulations that provide for worker and public safety against lead exposure.
- B. The publications listed below form a part of this specification to the extent referenced. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the more stringent requirements shall apply. The publications are referenced in the text by basic designation only.

#### **CODE OF FEDERAL REGULATIONS (CFR)**

29 CFR Part 1910	Occupational Safety and Health Standards for General Industry
29 CFR Part 1910.134	Respiratory Protection
29 CFR Part 1926	Occupational Safety and Health Regulations for Construction
29 CFR Part 1926.62	Lead

#### **U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)**

40 CFR Part 148	Hazardous Waste Injection Restrictions
40 CFR Part 260	Hazardous Waste Management Systems: General
40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR Part 268	Land Disposal Restrictions

#### **NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)**

NFPA 701	(1989) Methods of Fire Test for Flame-Resistant Textiles and Films
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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH OSHA Booklet 3142      Lead in Construction

CALIFORNIA CODE OF REGULATIONS (CCR)

8 CCR Part 1532.1	Lead
8 CCR Part 5194	Hazard Communication
17 CCR, Div. 1, Cpt. 8	Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards
22 CCR, Div. 4, Cpt. 30	Hazardous Waste Handling
26 CCR Part 3203	Illness and Injury Protection
26 CCR Part 3220	Emergency Action Plan
26 CCR Part 3221	Fire Prevention
26 CCR Part 5144	Respiratory Protection

CALIFORNIA HEALTH AND SAFETY CODE Section 25157.8 (from AB 2784 Strom-Martin, 1998)

UNDERWRITERS LABORATORIES (UL)

UL 586      (1990) High-Efficiency, Particulate, Air Filter Units

CALIFORNIA LABOR CODE

Section 6501.5-6505.5

ALL OTHER FEDERAL, STATE, COUNTY AND LOCAL CODES AND ORDINANCES AS APPLICABLE.

**1.6 Notifications and Permits**

- A. Contractor shall make all required written notifications or applications to regulatory agencies including the following:
1. California Division of Occupational Safety and Health (Cal-OSHA) -  
Lead Work Pre-Job Notification shall be accordance with 8 CCR Part 1532.1.  
California Department of Public Health (CDPH) Form CDPH 8551
  2. Local or facility agencies as applicable.

**1.7 Supervisor/Competent Person and Workers**

**All valid and current Supervisor/Competent Person and Workers documentation shall be physically present on site, prior to any lead related work being performed by that person. Failure to comply with this requirement shall render the person ineligible to work until the required documentation is available on site.**

- A. The Contractor shall have a California Department of Public Health (CDPH) Lead-Related Demolition Supervisor/Competent Person present at all times while work on this Contract is in progress. The Lead-Related Construction Supervisor/Competent Person shall possess the following training and certifications regardless of the results of the Test Section work. All certificates are to remain current and complete throughout the duration of the project.
- B. The Lead-Related Demolition Supervisor/Competent Person shall have successfully training meeting the requirements of 8 CCR Part 1532.1 and 17 CCR, Division 1, Chapter 8. Training shall be provided prior to the time of job assignment and, at least, annually. The Supervisor/Competent Person shall be thoroughly familiar and experienced with lead removal and related work, and shall be familiar with and enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of all EPA, OSHA, and NIOSH requirements and guidelines. Additionally, the Supervisor/Competent Person shall be certified as a Lead-Related Construction Supervisors in accordance with 17 CCR, Division 1, Chapter 8.

- C. Throughout the duration of the project, including during work on the Test Section, all workers shall have received training in accordance with 8 CCR Part 1532.1 and 17 CCR, Division 1, Chapter 8. The training shall be provided prior to the time of job commencement and, at least, annually. Additionally, all workers performing work shall be certified as Lead-Related Construction Workers in accordance with 17 CCR, Division 1, Chapter 8. All certificates are to remain current throughout the duration of the project. Throughout the duration of the project the lead-related worker training and certification requirements listed below will be required. The Contractor shall submit documentation that the workers have received the training. The training shall be for a minimum of eight hours. Worker training including the following information is required at a minimum. All certificates are to remain current and complete throughout the duration of the project.
1. An employee's right to access to records under 29 CFR Part 1910.1020.
  2. The contents and requirements of 29 CFR Part 1926.62 and 8 CCR 1532.1.
  3. The specific nature of the operation that could result in exposure to lead.
  4. The purpose, proper selection, fitting, use, and limitations of respirators.
  5. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health affects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant).
  6. Relevant engineering controls and good work practices.
  7. The contents of any compliance plan in effect.
  8. Instructions that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
- D. If the Contractors means and methods change from those presented in the lead-related demolition work plan and during the work of the Test Section, the Contractor shall perform another exposure assessment to determine the training requirements for the lead-related demolition workers.
- E. If the ongoing personal air monitoring performed by the Contractor indicates that the Action Level is being exceeded, the contractor shall provide lead-related demolition workers with the training and certifications required above.
- F. Current and complete documentation from a Physician that all employees or agents who may be exposed to airborne lead in excess of the action level have received a comprehensive medical examination as required by 29 CFR Part 1926.62 and 29 CFR Part 1910.1200 and will receive continued medical surveillance, including biological monitoring, as required by 29 CFR Part 1926.62 and 29 CFR Part 1910.1200 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor's expense, in accordance with 29 CFR Part 1910.1020. Biological monitoring is to include Blood Lead Level (BLL) and Zinc Protoporphyrin (ZPP). These tests are to be performed not more than 30 calendar days PRIOR to the commencement of work and results be presented prior to the commencement of the removal of any lead containing materials. If the work schedule is phased, the tests are to be repeated prior to the commencement of each phase of work; unless the close of one phase, and the commencement of the next phase, are less than 30 calendar days apart.
- G. Current and complete documentation from a Physician that all employees or agents who may be exposed to airborne lead in excess of the action level have received medical monitoring in accordance with 29 CFR Part 1926.62 to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health affects. The contractor must be aware of and provide information to the examining physician about

unusual conditions in the workplace environment (e.g. high temperatures, humidity, and chemical contaminants) that may impact on the employee's ability to perform work activities.

- H. Current and complete documentation of respirator fit-testing, performed within the last twelve months, for all Contractor employees and agents who must enter the work area. This fit testing shall be in accordance with qualitative procedures as required by OSHA regulations or be quantitative in nature

## **1.8 Submittals**

- A. Submit, as applicable, the following to the Owner's Representative for approval within Ten (10) days of receiving the "Notice to Proceed" or at least Ten (10) Working Days prior to the start of work. These submittals are in addition to those required in any other section(s) or sub-section(s) of these documents. This document shall be submitted by the contractor performing the work and not by any other. Include at the very least the following:

1. Notifications. All notifications shall be current and valid throughout the duration of the project. Any material changes to the notification, i.e., the quantity of materials being removed, the physical materials being removed, the duration of the project, etc. shall require revisions to the regulatory agencies, with copies provided to the HPM on site. Copies of the written notification and confirmations at least to/from the following regulatory agencies will be required:
  - a. California Division of Occupational Safety and Health (Cal-OSHA) Lead Work Area Pre-Job Notification.
  - b. Notification to the California Department of Public Health (Form 8551).
2. Waste Haulers – Copies of:
  - a. Identification of the Waste Hauler(s) for both Hazardous and Non-Hazardous Lead Waste for this Project.
  - b. California Department of Toxic Substances Control (DTSC) Waste Transporter registration for each Waste Hauler.
  - c. California Department of Motor Vehicles (DMV) Motor Carrier Permit for each Waste Hauler.
  - d. U.S. Department of Transportation (DOT) Registration and U.S. Environmental Protection Agency (EPA) acknowledgement of Notification of Hazardous Waste Activity for each Waste Hauler (*only required if waste is to be transported out of State*).
  - e. Statement indicating that all waste generated on this specific site shall be transported by/disposed of by licensed, insured and certified personnel/locations.
  - f. Statement that the types of Waste Containers being used for this Project will be accepted by the Waste Hauler(s) for the storage and transport of both Hazardous and Non-Hazardous Waste.
3. Waste Disposal Facility - Landfill and/or Recycling Facility – Copies of:
  - a. Identification of the Landfill(s)/Recycler(s) to be used for the disposal of both Hazardous and Non-Hazardous Lead containing Waste generated at the Project site.
  - b. Permits for the Landfill(s)/Recycler(s) to be used for the disposal of both Hazardous and Non-Hazardous Lead waste generated at the Project site.
  - c. Identification of the Types of Waste accepted at the Landfill(s)/Recycler(s).
  - d. Identification of the Types of Waste Profiling required by the Landfill(s)/Recycler(s).
  - e. Statement that the types of Waste Containers being used for this Project will be accepted by the Landfill(s)/Recycler(s) for both Hazardous and Non-Hazardous Waste.
4. Licensure – Copy of the current California Contractors State Board (CSLB) License (minimum requirement is a Class B license or a Class C license) for any and all Contractor(s) or Sub-Contractor(s) involved in any facet of lead related work enumerated as part of this project.
5. Work Plan – A detailed written lead-related demolition work plan including, but not limited to, the following:
  - a. Identification of all Lead Scope of Work items and Trigger Tasks that are part of this Project, as well as, the Waste Streams the contractor anticipates generating during the course of performing the work listed in the Scope of Work;

- b. Identification of entire Work Sequence (schedule) for this Project, including specifics of materials being removed/stabilized and the correlation between work areas and Types of Work (Lead, Asbestos, PCB, etc. as applicable);
  - c. Identification of abatement duration;
  - d. Identification of dust control measures;
  - e. Identification of work area preparation;
  - f. Identification of construction for decontamination enclosure systems;
  - g. Identification of demarcation protocols. i.e., installation of Lead barrier tape, barrier fence, Lead Work signage, etc.;
  - h. Identification of work area isolation protocols;
  - i. Identification of detailed specific Lead containing materials removal procedures;
  - j. Identification of Lead containing/contaminated debris clean-up and disposal procedures;
  - k. Identification of Personnel Protective Equipment (PPE) to be utilized as part of this project;
  - l. Identification of waste handling, storage and disposal procedures;
  - m. Identification of construction for chutes, (if required for this project).
6. HEPA vacuums, differential pressure air filtration devices and other local exhaust ventilation equipment. – Copies of:
- a. Manufacturer's certification that HEPA vacuums, differential pressure air filtration devices, filters and other local exhaust ventilation equipment conforms to ANSI Z9.2-79.
  - b. Notification that required onsite testing has been scheduled for any and all differential pressure units, HEPA vacuum cleaners, etc. to ensure that the filtration efficiency meets the criteria for HEPA filtration devices, i.e., 99.97% efficiency at arresting mono-dispersed particulate matter greater than 0.03 micrometers in diameter.
7. SDS – The Contractor shall submit copies of the Safety Data Sheet, fire retardant certification or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for each surfactant, encapsulating material, spray glue, mastic removal agent, plastic sheeting, adhesive/duct tape, etc. or other chemicals/products for use on this project, including the specific worker protective equipment proposed for use with the material indicated.
8. Personnel Documentation
- a. Identification of the project's Lead-Related Supervisor who is experienced in administration and supervision of lead-containing material demolition projects, including work practices, protective measures for building and personnel, disposal procedures, etc. including a legible photocopy of the California Department of Public Health (CDPH) Certified Lead Construction Supervisor's card.
  - b. Current and complete documentation that the Contractor's Lead-Related Construction Supervisor/Competent Person and Lead-Related Demolition Workers performing Lead-related demolition, disposal, and air sampling operations have received training and are certified including a legible photocopies of the California Department of Public Health (CDPH) Certified Supervisor and Certified Lead Worker cards.
  - c. Provide as part of the pre-job submittal a letter from the contractor, signed by a responsible and authorized officer of the contractor's company certifying the following – "This is to certify that all our personnel involved with affecting any lead containing or coated materials/surfaces are subject to current and valid medical monitoring in accordance with 29 CFR Part 1926.62 and 29 CFR Part 1910.1200 and that they will receive continued medical surveillance, including (a) the ability to work while wearing required respiratory protection without suffering adverse health affects and (b) biological monitoring [include Blood Lead Level (BLL) and Zinc Protoporphyrin (ZPP)], as required by 29 CFR Part 1926.62 and 29 CFR Part 1910.1200 and by all state and local regulations pertaining to such work. Furthermore, we certify that all relevant records shall remain valid and current throughout the project and that historical records will be retained by us, in accordance with 29 CFR Part 1910.1020." The contractor may issue this letter and identify and list (by name) all of their employees who will be on site for this project or, alternatively issue an individual letter per employee.

- d. Current and complete documentation of respirator fit-testing for Contractor employees and agents who must enter the work area. This fit-testing shall be in accordance with qualitative procedures as required by OSHA regulations or be quantitative in nature
- 9. Respirators and Filters – Copies of Manufacturer’s documentation and certification of NIOSH approvals for respiratory protective devices utilized on site, including manufacturer’s certification of NIOSH approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate) and High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges and filters.
- 10. Testing Laboratory – Identification of the Independent Testing Laboratory (name, address, and telephone number) selected to perform analysis of personal air samples. Documentation shall be provided that the laboratory selected to perform the analyses is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and is rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT), including accreditation for heavy metal analysis. The documentation shall list experience relevant to the analysis of lead in air and include a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (AALA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditation agencies. Documentation must also be provided that the laboratory is certified by the California Department of Public Health (CDPH).
- 11. Site Specific Documentation – Copies of:
  - a. Identification of Work Area(s) at the site;
  - b. Identification of the nearest medical facility and route map/directions to the medical facility;
  - c. Emergency Contact Information and numbers for Emergency services as well as the contractors’ emergency contact personnel and information;
  - d. Identification of on-site emergency meeting location;
  - e. Identification procedures for personnel accounting during an emergency.
- 12. Contractor General Documents – Copies of:
  - a. General Injury & Illness Prevention Program in compliance with 26 CCR 3203.
  - b. General Emergency Action Plan in compliance with 26 CCR 3220.
  - c. General Fire Prevention Plan in compliance with 26 CCR 3221
  - d. Respiratory Protection Program in compliance with 26 CCR 5144.
- B. Hazardous Waste Manifests, Non-Hazardous Waste Data forms, trip tickets and disposal receipts for lead waste materials removed from the work area must be received within 24 hours of the transport.
- C. On-Site Documentation – Documents to be provided on-site throughout the duration of the project:
  - 1. Provide on a DAILY basis, prior to the start of the shift, results from the personal air samples collected during the abatement process of the prior shift.
  - 2. Provide on a DAILY basis, prior to the start of the shift, copies of the containment entry log pertaining to the abatement process of the prior shift.
  - 3. Provide on a DAILY basis, prior to the start of the shift, copies of the Manometer logs pertaining to the abatement process of the prior shift.
  - 4. Copies of the Safety Data Sheets (SDS) for solvents, encapsulants, wetting agents, neutralizers, any other chemicals/products used on site and replacement materials, as necessary.
- D. Following completion of work on the Test Sections, submit to the Owner’s Representative documentation that includes the following (the submittals required shall be submitted no later than five business days following completion of the Test Section work):
  - 1. All personal air sampling performed by the contractor during the Test Section work. The personal air sampling results shall be provided as 8-hour TWA results.

2. A description of the Trigger Tasks utilized during the Test Section work.
  3. Proposed changes in work procedures, if any, from those that were proposed in the original work plan.
- E. Upon completion of all lead-related demolition activities, submit to the Owner's Representative documentation that includes, without limitation, the following (the submittals required shall be submitted no later than 20 business days following the Contractor's demobilization from the project site):
1. Work area entry/exit logbook. The logbook must record name, affiliation, time in, and time out for each entry into the work site.
  2. The log of manometer readings showing the pressure differential maintained throughout the project.
  3. OSHA, Cal-OSHA, California Department of Public Health (CDPH) required personal exposure air monitoring results.
  4. Post project Biological monitoring for each employee who has worked at the site during any phase of lead related work is to include Blood Lead Level (BLL) and Zinc Protoporphyrin (ZPP). These tests are to be performed not more than 7 calendar days AFTER the conclusion of work
  5. Accident/incident reports where injury or damage has occurred on or to the Owner's property.
  6. Hazardous waste manifests, non-hazardous waste data forms, trip tickets and disposal receipts for lead waste materials removed from the work area within 24 hours of the transport.

## **1.9 Notices and Postings**

- A. Post in the wash station/decontamination station, a list containing the names, addresses, and telephone numbers of the Contractor, Owner Representative, HazMat Project Manager, and emergency contact numbers.
- B. Post at the job site a list of persons authorized to enter the lead-related demolition work area.
- C. Additional postings shall include:
  1. Visitor entry and exit log.
  2. Employee daily sign in/out log.
  3. Work area entry and exit procedures.
  4. Emergency procedures.
- D. One copy of Cal-OSHA and Department of Health Services regulations.
- E. Posted Warnings and Notices: The following regulations, warnings, and notices shall be posted at the work site in accordance with 29 CFR Part 1926.62 and 8 CCR Part 1532.1.
  1. Warning Signs and Labels: Warning signs shall be provided at building entrances and approaches to lead work control areas containing airborne lead debris. Signs shall be located at a sufficient distance from the lead work control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the lead work control area.
  2. Post at least two (2) safety warning signs, in English and Spanish, which follow the "Sample Format Warning Sign" shown below:

Sample Format Warning Sign  
Minimum Size – 24” x 36”  
Material – Aluminum or Fiberglass  
Script:

**WARNING**  
**LEAD WORK AREA**  
**POISON**  
**NO SMOKING OR EATING**  
**AUTHORIZED PERSONNEL ONLY**  
**RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

- F. Posting required by local, state and federal agencies exercising jurisdiction over the work area. These are to include, but not be limited to, warning notices, notices of proposed work activity, copies of notifications to local and state agencies, etc.

#### **1.10 Work Area Security**

- A. The lead work control area shall be restricted only to authorized personnel, including Contractor, Contractor's employees, Owner's Representative(s), and federal, state, and local inspectors.
- B. Entry into the lead work control area by unauthorized individuals shall be reported immediately to the Owner's Representative.
- C. Contractor shall be responsible for Project site security during lead-related demolition operations in order to protect work efforts and equipment.

#### **1.11 Personal Protection and Safety**

- A. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his/her appliances, methods, and for any damages that may result from his/her operations, improper construction practices, or maintenance. He shall erect and properly maintain at all times as required by the conditions and progress of the work, proper safeguards for the protection of workmen and the public and shall post warning signs around the job site and at any and all entrances / entryways to the work area(s).
- B. Work shall be performed in accordance with the requirements of applicable regulations including, but not limited to 29 CFR Part 1926.62, 8 CCR Part 1532.1, and 17 CCR, Division 1, Chapter 8. Matters of interpretation of the standards shall be submitted to the appropriate agency for resolution before starting work. Where these requirements vary or conflict, the most stringent shall apply. In the event that work practice variances are granted by the governmental agency having jurisdiction over the work, these variances will be forwarded to the Owner and/or the Owner's representative as soon as the variance has been issued. A copy of the variance must also be posted at the entryway to the work area or if this is not possible, in a prominent place.
- C. Respiratory Protection Requirements: A respiratory protection program shall be established as required by 29 CFR Part 1926.103 and 29 CFR Part 1926.62 and in accordance with 29 CFR Part 1910.134. An approved respirator shall be furnished to each employee and visitor required to enter a lead work control area. A fit test shall be conducted in accordance with 29 CFR Part 1926.62.
1. Air-purifying respirators shall be approved by NIOSH for use with dust, fumes, and mists having permissible exposure limits less than 0.005 milligrams per cubic meter (i.e., have P-100 filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. Respirators shall



comply with the requirements of 29 CFR Part 1926.62 and shall be used in accordance with 29 CFR Part 1926.103, and 29 CFR Part 1910.134.

2. A sufficient supply of respirator filters shall be maintained at the work site to provide new filters to employees, Owner Employees, authorized visitors, and government regulator personnel throughout the duration of the project. Filters shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the filter becomes wet. At any time during on-site work activity, the contractor shall maintain on-site and readily accessible three (3) new respirators, one in each size, small, medium and large along with the requisite filters/cartridges for the type of work being performed. These respirators will be kept in readiness for the Owner/Owner's representative or any governmental agency representative having jurisdiction over the project.

Additionally, the contractor shall make available to HPM two (2) sets of new North™ 7700 Series Respirator Filter Cartridges throughout the duration of the project. These filter cartridges shall be appropriate to the work being conducted on site i.e., P100 HEPA cartridge and/or stacked P100 HEPA + Organic Vapor cartridge, etc.

3. Respirators shall be fit-tested utilizing irritant smoke or isoamyl acetate a minimum of every 6-12 months. Either the standard Irritant Smoke Protocol or Isoamyl Acetate Protocol may be used.
- D. A Hazard Communication Program shall be implemented in accordance with 29 CFR Part 1926.59.
  - E. The Contractor, the HazMat Project Manager, and the Owner's Representative shall arrange and hold a preparatory inspection meeting immediately prior to beginning the Test Section, following completion of the Test Sections to discuss the results, following completion of the waste characterization sampling and analysis, and prior to beginning the lead-related demolition work.
  - F. Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, State, and local regulations.
  - G. Daily personnel air monitoring results shall be placed in a clearly visible area of the work site and shall be prepared so as to be easily understood by the workers.
  - H. A list of emergency telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, poison control center, police and fire departments, Government, Contractor, and Owner representatives who can be reached 24 hours per day, and professional consultants directly involved in the project.
  - I. Sufficient quantities of health and safety equipment and supplies as required by 29 CFR Part 1926.62 and 8 CCR Part 1532.1, and other materials and equipment needed to complete the project, shall be available and kept on site. Specific health and safety equipment to be utilized at all times during performance of lead-related demolition work includes the following.
    1. Disposable full body suits. The disposable full body suits shall have head and foot covers and shall be of a sufficient size to prevent tearing during performance of the work.
    2. Disposable rubber gloves.
    3. Hard hats.
    4. Safety shoes or boots.
    5. Eye and hearing protection.
  - J. A wash/decontamination station shall be provided on the site at all times that lead-related demolition work is being performed.

### 1.12 Hazmat Project Manager Services

- A. The Owner has contracted with the HazMat Project Manager (HPM) to perform contractor and project monitoring services including the following:
1. Collect side-by-side Contractor employee exposure air samples during the lead-related demolition work.
  2. Collect perimeter air samples during the lead-related demolition work.
  3. Collect waste characterization samples during the lead-related demolition work.
- B. Stop Work Orders. The HPM will stop work in the following situations:
1. If the airborne lead concentration exceeds  $10 \mu\text{g}/\text{m}^3$  outside the lead-related demolition work area but inside the construction zone.
  2. If the airborne lead concentration outside of the lead-related demolition work area exceeds background levels established before the commencement of work.
  3. If the Contractors means and methods change, work will be stopped to establish a new exposure assessment.
  4. If personal air monitoring indicates that new respiratory protection is required.
  5. If the written specifications are being violated or if the owner issued instructions are being circumvented.

**SUB-SECTION 02**  
**MATERIALS AND EQUIPMENT**

**2.0 MATERIALS and EQUIPMENT**

**2.1 Materials**

A. General: Contractor shall adhere to the following:

1. All plastic, spray-on strippable coatings, electrical equipment, mechanical equipment and structural materials used shall be UL-certified as fire retardant or non-combustible.
2. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer, brand name (where applicable), and model.
3. Polyethylene sheeting utilized for worker decontamination and barriers shall be black or opaque in color and shall be a minimum of 6-mil in thickness. All polyethylene shall be fire retardant.
4. Waste containers utilized during the project shall be properly labeled as required by 29 CFR Part 1926.62, 8 CCR Part 1532.1, and, if applicable, 22 CCR 66504.
5. Warning signs as required by 8 CCR Part 1532.1 and 29 CFR 1926.62 shall be utilized during lead-related demolition activities.
6. PVC Safety/Barrier Fence (minimum of 4' high) to isolate the work area shall be utilized during any lead-related activities.

**2.2 Equipment**

A. General:

1. HEPA vacuums equipped with HEPA filtration and operated in accordance with ANSI Z9.2-79.
2. Differential pressure (negative pressure) air filtration devices and other local exhaust ventilation equipment conform to ANSI Z9.2-79. On site testing will be required for any and all differential pressure units, HEPA vacuum cleaners, etc. to ensure that the filtration efficiency meets the criteria for HEPA filtration devices, i.e., 99.97% efficiency at arresting monodispersed particulate matter greater than 0.03 micrometers in diameter.
3. Respirators shall be furnished to the workers by the Contractor. The respirators shall have been tested and approved by National Institute of Occupational Safety and Health (NIOSH) for use in lead contaminated atmospheres. Respirator usage during the project shall be determined by the results of the sampling and analysis performed during the Test Section and shall be in accordance with the requirements of 8 CCR 1532.1 and the work plan submitted by the Contractor. The respiratory requirements below shall be utilized at a minimum:
  - a. Half-face air purifying respirators equipped with P-100 filters at a minimum shall be utilized during the Test Section Work.
  - b. If the Test Section work, or periodic personal monitoring indicates that the airborne lead concentration will exceed the Action Level, the Contractor shall utilize respiratory protection as indicated by the actual airborne lead concentration.
  - c. If the Test Section work indicates that the airborne lead concentration will not exceed the Action Level, the Contractor at his discretion may downgrade the respiratory requirements for the project. The minimum

permissible respiratory protection throughout the project, permitted by these specifications is a half-face (half-mask) negative pressure respirator equipped with P-100 respirator. This minimum standard shall be adhered to even in the event that the Test Phase of the project determines that respiratory protection is not required. This supercedes any and all instructions to the contrary that may be found in these documents.

4. Contractor shall provide full body disposable protective clothing, including head, body, and foot coverings to workers and visitors in sizes adequate to accommodate movement without tearing. Full body disposable protective clothing shall be utilized at all times during lead-related demolition activities.
5. Additional safety equipment (e.g. hard hats meeting the requirements of ANSI Standard Z89.1-1981, eye protection meeting the requirements of ANSI Standard Z87.1-1979, safety shoes meeting the requirements of ANSI Standard Z41.1-1967, disposable gloves), as necessary, shall be furnished to all workers and authorized visitors. This safety equipment shall be utilized at all times during lead-related demolition activities.
6. Non-skid footwear shall be furnished to all workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.
7. Furnish disposable mops, rags, and sponges for work area decontamination.

B. Removal:

1. Scaffolds, ladders, lifts, and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be furnished as needed.
2. Rubber dustpans and rubber squeegees shall be furnished for cleanup.
3. Brushes utilized for removing loose lead-containing materials shall have nylon or fiber bristles. Metal bristles shall not be utilized.

## **SUB-SECTION 03 EXECUTION**

### **3.0 EXECUTION**

#### **3.1 Lead-Containing Material Removal Preparation**

##### **A. Exterior Lead-Related Demolition Work Area Preparation:**

1. Prepare a lead work control area by placing 4' high PVC Safety/Barrier Fence and lead warning tape and proper signage around the area where work will be performed. The PVC Safety/Barrier Fence and warning tape should be placed a sufficient distance away from the removal area to allow persons who are not properly trained or who are not wearing personal protective equipment to avoid the work/contaminated area.
2. Install remote worker decontamination unit described in Article 3.2 or as agreed upon with the Owner's HPM.
3. Lead Workers shall don personnel protective equipment as required in Article 2.2.
4. Place one layer of 6-mil polyethylene sheeting on the ground as close as possible to the foundation, or the exterior floors (i.e., deck or porch) when applicable.
5. Extend plastic sheeting a minimum of ten feet out from the foundation.
6. Weight down the polyethylene sheeting at the foundation, and along all edges and seams.
7. The Contractor shall take extra care when performing exterior lead-related demolition on days when the constant wind speed is 15 mile per hour or over. If the removal procedure is producing dry waste in which visible movement along polyethylene sheeting is evident or if dust or debris is present outside of the lead work control area, the Contractor shall change the methods used for dust control to eliminate the problem. In any event, when visible emissions from the work activity are observed crossing the property line/ work area perimeter, all removal work will cease immediately. The contractor will implement emergency dust control measures and work shall not recommence until permission is granted by the Hazardous Project Monitor.
8. Perform lead removal in accordance with Article 3.06 – Lead-Related Demolition.

##### **B. Interior Lead-Related Demolition Work Area Preparation:**

1. Prepare a lead work control area by placing 4' high PVC Safety/Barrier Fence and lead warning tape and proper signage around the area where work will be performed. The PVC Safety/Barrier Fence and warning tape should be placed a sufficient distance away from the removal area to allow persons who are not properly trained or who are not wearing personal protective equipment to avoid the work/contaminated area.
2. Install remote worker decontamination unit described in Article 3.2 or as agreed upon with the Owner's HPM.
3. Lead Workers shall don personnel protective equipment as required in Article 2.2.
4. Place one layer of 6-mil polyethylene sheeting over all critical barriers including HVAC vents, windows, doorways, and corridor openings.
5. Place a drop cloth constructed of one layer of 6-mil polyethylene sheeting in all areas where interior lead-related demolition is to be performed. This drop cloth is to be sized and affixed in such a manner as to prevent any dust and debris landing on it from escaping. Precautions must be taken to prevent slips, trips and falls of personnel walking on this plastic surface.
6. A pressure differential system may be required, refer to the scope of work attached and/or consult with the HPM. If required, the pressure differential system shall produce a minimum of four filtered air changes per hour in the contained work area (work area to include a wood chipper and/or dumpster) and maintains a pressure differential of 0.02-inch water gauge between the inside and outside of the work area on a continuous basis.
7. Perform lead-containing material removal in accordance with Article 3.6 – Lead-Related Demolition.

##### **C. Wood Chipper: The following procedures shall be utilized if a wood chipper is proposed to be used by the Contractor:**

1. Construct a contained work area around the wood chipper and waste dumpster. The contained work area shall

be constructed of two layers of 6-mil polyethylene sheeting that is mechanically supported.

2. Install worker decontamination unit described in Article 3.2 or as agreed upon with the Owner's HPM.
3. Lead Workers shall don personnel protective equipment as required in Article 2.2.
4. A pressure differential system shall be established that produces a minimum of four filtered air changes per hour in the contained work area (including the wood chipper and dumpster) and maintains a pressure differential of 0.02-inch water gauge between the inside and outside of the work area.
5. Perform lead-containing material removal in accordance with Article 3.6 – Lead-Related Demolition.

### **3.2 Remote Worker Decontamination Systems**

- A. A minimum of one three-stage decontamination system is required to be operational on the site at all times that lead-related demolition is being performed. The decontamination system shall comply with the following requirements.
1. Worker decontamination enclosure systems shall be provided at a location near or adjacent to the lead work control areas. As a minimum, one system at a single location is required.
  2. Worker decontamination enclosure systems constructed at the Project site shall utilize 6-mil black or opaque polyethylene sheeting, or other approved materials for privacy.
  3. The personnel decontamination unit shall not be located inside the work area unless otherwise authorized by the Owner's HPM.
  4. The worker decontamination enclosure system shall consist of at least a clean room, a shower room and an equipment room, each separated from the other and from the work area by flaps comprised of three sheets of 6-mil polyethylene sheeting.
  5. Clean rooms shall be sized to adequately accommodate the work crew. Space for storing respirators shall be provided in this area. Clean work clothes; clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply at the clean room. Posting of notices shall also be in this area or in an area immediately adjacent to the clean room. Postings shall be sited in a manner to ensure line of site visibility prior to approaching/entering the clean room.
  6. Shower rooms shall contain at least a Hudson sprayer for washing the workers hands, face, and respirator. The shower enclosure shall be constructed to ensure against leakage of any kind. Shower water shall be drained, collected and either filtered through a system with at least 0.5-1.0 micron particle sizes collection capability or disposed of as contaminated waste. Additionally, the contractor and their personnel shall make themselves conversant of the requirements of any local water pollution agency or municipal waste water treatment agency prior to discharging any filtered or treated waste water. In no event shall the waste water be discharged without adequate filtration.

### **3.3 Maintenance of Construction/Lead-Related Work Area Barriers**

At any time during the lead related work activities after barriers have been erected, if visible material is observed outside of the work area or if damage occurs to barriers, work shall immediately stop, repairs made to barriers, and debris/residue cleaned up using appropriate procedures. In addition, the barriers shall be moved farther away from the lead-related work area.

### **3.4 Commencement of Work Shall Not Occur Until**

- A. Test Section: Work on the Test Section shall not occur until the following items have been completed.
  - 1. Pre-work submissions, notifications, and permits required and submittals have been provided and approved by the Owner's Representative.
  - 2. Construction and lead work control area barriers are in place.
  - 3. At least one wash station/decontamination station is operational.
- B. Interior Work Areas: Work on the interior of the building shall not occur until the following items have been completed.
  - 1. The removal of the asbestos-containing floor tile and mastic has been completed.
  - 2. Results from the interior Test Section have been submitted and the work practices for the interior work have been approved by the Owner's Representative.
  - 3. Construction and lead work control area barriers are in place.
  - 4. At least one wash station/decontamination station is operational.
- C. Exterior Work Areas: Work on the exterior of the building shall not occur until the following items have been completed.
  - 1. The interior asbestos-related demolition has been completed.
  - 2. The interior lead-related demolition has been completed.
  - 3. Results from the exterior Test Section have been submitted and the work practices for the exterior work have been approved by the Owner's Representative.
  - 4. Construction and lead work control area barriers are in place.
  - 5. At least one wash station/decontamination station is operational.
- D. No work task shall be performed without an initial assessment.

### **3.5 Workplace Entry and Exit Procedures**

- A. General: The following procedures shall be followed prior to entrance into any lead-related work area:
  - 1. Personnel, before entering the lead-related work area, shall read and be familiar with posted regulations, personal protection requirements (including workplace entry and exit procedures), and emergency procedures.
  - 2. Personnel shall wear respirators, disposable coveralls, head covering, and foot covering. Hardhats, eye protection, and gloves shall also be utilized, as required. Clean protective clothing shall be provided and utilized by each person for each separate entry into the work area.
  - 3. To exit the work area, personnel shall proceed to the wash station/decontamination station where they shall remove protective equipment and deposit disposable clothing into appropriately labeled containers for disposal and wash their hands, face, and any other exposed portions of their body.

### 3.6 Lead-Related Demolition

#### A. General - REMOVAL OF LEAD CONTAINING COATINGS

1. The Contractor will be required to remove paints and coatings as identified in areas scheduled for demolition or architectural renovations, as applicable. Do not remove lead-containing coatings with a torch or flame, except as an unavoidable result of welding or torching operations.
2. Grinding/Cutting, Welding or Torching Operations: To the extent feasible, and to avoid direct grinding/cutting, welding, or torching on surfaces containing lead in concentrations greater than 0.64  $\mu\text{g}/\text{cm}^2$ , by manually or chemically removing all layers of the coating to a distance of:
  - For at least four inches (4") on ALL side from the point at which mechanical abrasion or grinding is proposed,
  - at least eighteen inches (18") on ALL side from the point at which heat is proposed to be applied. To prevent the vaporization of lead from the surrounding areas the contractor shall endeavor to keep these surrounding areas cool.
3. Removal of Surface Coatings with Power Tools: Where mechanical removal of surface coatings constitutes an Activity Level II activity, provide power tools with local HEPA exhaust or dust collection systems to capture the aerosolized lead.
4. Maintain all work area surfaces as free as practicable from accumulated dust or debris. Dry sweeping or use of compressed air to remove dust or debris is not permitted. Clean all equipment, tools and containment structures within regulated areas, at a minimum, with HEPA vacuums or wet methods.
5. Conduct operations to prevent injury to adjoining facilities, persons, motor vehicles, etc., as applicable. Prevent chemical cleaning agents from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be injured or damaged by such contact. Do not spray or scrape outdoors during winds of sufficient force to spread cleaning agents to unprotected surfaces.
6. For areas where full abatement is not required, the Contractor shall ensure that the paint that remains on interior walls, ceilings or other area surfaces in areas of active work as applicable, shall be adhered to the substrate sufficiently to support eventual repainting. Paints that peel or loosen during wetting will become part of the scope of work scheduled for abatement.

In areas where substrate stabilization is called for, the contractor shall smoothen the edges from which paint has been removed (i.e., 'feather') and apply at least three (3) coats of a non-lead containing paint primer to the removed substrate plus at least two feet (in every direction) from the edges of the area of partial removal. The primer used for stabilization shall be suitable for application on the specific substrate. NOTE, THIS OPTION IS NOT AVAILABLE FOR IMPACT OR FRICTION SURFACES WHERE ALL LEAD CONTAINING MATERIALS ARE TO BE REMOVED IN THEIR ENTIRETY TO THE SUBSTRATE.

7. In areas where damaged or other asbestos-containing materials will be disturbed during lead paint abatement, the Contractor shall handle this material in accordance with specification Section 02 82 13. Removed asbestos materials shall be placed in two 6-mil disposal bags and fiber drums and disposed of as asbestos waste. Lead and asbestos wastes shall not be combined, where practical. Mixed debris containing both lead and asbestos needs to be disposed at a landfill licensed to accept both types of waste with proper manifests. Only personnel trained, certified and meeting all criteria of both the asbestos abatement specification (section 02 82 13) and the lead abatement specifications (section 02 83 00) shall be permitted to attempt any removal that impacts both these materials.
8. Non-paint waste items found on floors are to be separated out and disposed of or cleaned by the Contractor. Small pieces of debris, such as broken glass, paper, etc., may be disposed of with the lead paint. - Large



items, such as equipment, furnishing, etc., are to be cleaned by HEPA vacuuming at the same time as the floors and stored on-site as directed by the Owner.

9. Seal all floor openings and protect the floor with polyethylene drop cloths or other acceptable means to prevent contamination or damage to other building surfaces and finishes.
10. Provide HEPA-filtered exhaust units for area ventilation during removal, minimum 1,500-cfm capacity per unit. Provide one unit for each 3,500-sq. ft. of floor space to be covered per workday. Units must be portable and placed in the vicinity of removal operations. Exhaust units outside building. Provide temporary shoring as necessary to support equipment and workers. Establish a minimum of 0.025 inches water gauge negative pressure between the work area and the adjacent areas, as applicable, measured at a location approved by the Environmental Consultant.
11. Work areas may require full or partial scaffolding to allow for continued expiation of the facilities during the construction period. Segregate areas by erecting solid plywood platforms on movable scaffolding and erecting 2 layers of 6-mil polyethylene sheeting to the structure above for full isolation of the assembly.
12. Shoveling, wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and are found to be ineffective.
13. The use of steam cleaning and compressed air removal methods is not permitted. Abrasive removal equipment shall be equipped with local HEPA exhausts or dust collectors.
14. The use of abrasive mechanical cleaning will generally not be permitted, unless approved in advance by the Owner and the Environmental Consultant; this prohibition includes sanding discs, sand blasting, or other abrasive compounds.
15. Strictly conform to the approved cleaning procedures as recommended by the product manufacturer. Should a modification to the cleaning method specified be proposed, submit the proposal in writing for consideration and review by the Owner and its representative. These individuals will have the right to ask for test samples before final approval. Any such modification or change shall be at no additional cost to the Owner.
16. Begin cleaning only after all sample panels and other required submissions are approved and protective means and methods are in place.
17. Where complete removal is required, finished work shall show no signs of stains, scratches, streaks, or runs of discoloration from use of cleaners. Leave all substrate surfaces neat and clean, including removal of all primers as well as surface coats. All surfaces should be uniformly cleaned.

B. Interior Lead-Related Demolition: The Contractor shall utilize the following procedures in addition to those proposed during the Test Sections and in the lead-related demolition work plan required by Article 1.08 when performing lead-related demolition on the interior of the building. Airborne lead concentrations outside the lead work control area but inside of the work area shall be kept below  $10 \mu\text{g}/\text{m}^3$ . Airborne lead concentrations outside of the work area shall be kept below the background level measured prior to the commencement of construction activities. If the airborne lead concentration outside of the lead work control area exceeds  $10 \mu\text{g}/\text{m}^3$  or if the airborne lead concentration outside of the work area exceeds background levels, then work shall cease and new engineering controls and work procedures shall be utilized.

1. Interior lead-related demolition shall be performed in a manner that reduces the amount of airborne lead particulate generated.
2. While performing manual demolition, the material shall be kept wet to reduce airborne lead concentrations.

The material shall only be wetted to a point that dust control is maintained. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during manual demolition shall not be allowed to dry out and shall be quickly packaged and placed into the waste containers required by the waste hauler and landfill.

3. If mechanical methods (power equipment) are used such as saws or grinders, this equipment should be used in a manner that reduces airborne lead concentrations. The area to be cut or ground shall be free of all lead coatings, paints, primers etc. PRIOR to cutting or grinding. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during mechanical demolition shall not be allowed to dry out and shall be quickly packaged and placed into the waste containers required by the waste hauler and the landfill. The equipment shall be decontaminated prior to removing it from the lead work control area.
4. If machinery/open flame is used to perform lead-related demolition, the lead-containing materials shall be pre-wetted and shall be kept continually wet during demolition. The area to be cut or ground shall be free of all lead coatings, paints, primers etc. PRIOR to using mechanical equipment or open flame. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during mechanical/open flame demolition shall be quickly packaged and placed into the waste containers required by the waste hauler and the landfill. The machinery shall be decontaminated prior to removing it from the lead control work area.

C. Exterior Lead-Related Demolition: The Contractor shall utilize the following procedures in addition to those proposed during the Test Sections and in the lead-related demolition work plan when performing lead-related demolition on the exterior of the building. Airborne lead concentrations outside the lead work control area but inside of the work area shall be kept below  $10 \mu\text{g}/\text{m}^3$ . Airborne lead concentrations outside of the work area shall be kept below the background level measured prior to the commencement of construction activities. If the airborne lead concentration outside of the lead work control area exceeds  $10 \mu\text{g}/\text{m}^3$  or if the airborne lead concentration outside of the work area exceeds background levels, then work shall cease and new engineering controls and work procedures shall be utilized.

1. Exterior lead-related demolition shall be performed in a manner that reduces the amount of airborne lead particulate generated.
2. While performing manual demolition, the material shall be kept wet to reduce airborne lead concentrations. The material shall only be wetted to a point that dust control is maintained. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during manual demolition shall not be allowed to dry out and shall be quickly packaged and placed into the waste containers required by the waste hauler and landfill.
3. If mechanical methods (power equipment) are used such as saws or grinders, this equipment should be used in a manner that reduces airborne lead concentrations. The area to be cut or ground shall be free of all lead coatings, paints, primers etc. PRIOR to cutting or grinding. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during mechanical demolition shall not be allowed to dry out and shall be quickly packaged and placed into the waste containers required by the waste hauler and the landfill. The equipment shall be decontaminated prior to removing it from the lead work control area.
4. If machinery/open flame is used to perform lead-related demolition, the lead-containing materials shall be pre-wetted and shall be kept continually wet during demolition. The area to be cut or ground shall be free of all lead coatings, paints, primers etc. PRIOR to using mechanical equipment or open flame. The Contractor shall take care not to produce runoff or excess water waste. Waste generated during mechanical/open flame demolition shall be quickly packaged and placed into the waste containers required by the waste hauler and the landfill. The machinery shall be decontaminated prior to removing it from the lead control work area.

### 3.7 Lead Work Area Clean Up Procedure

- A. Maintain surfaces within the lead work control area free of accumulations of lead debris and dust. Restrict the spread of dust and debris. Keep waste from being distributed over the work area. Do not dry sweep or use

compressed air to clean up the area. When the lead removal operation has been completed, clean the area of visible lead contamination by vacuuming with a HEPA filtered vacuum cleaner and/or wet mopping the area.

- B. Final Cleaning: After all lead-containing materials are removed; the Contractor shall clean any remaining items remaining inside of the building including wall support systems, roof support systems and the concrete slab to remove any "settled" lead dust/debris. The wall and deck support systems shall be wet wiped using towels, rags, and sponges. The concrete slab shall be HEPA vacuumed and then mopped with plain water. The following procedures shall be used:
1. Wash all surfaces in the work area with a solution containing 5 percent tri-sodium phosphate (TSP) or equivalent. Prepare solution using hot water. Workers shall use towels, sponges, and mops to clean all surfaces including all areas that had been covered with polyethylene sheeting. Cleaning shall start at the ceiling and work down to the floors. A new solution of TSP/TSP Substitute and water shall be mixed as the water becomes dark or dirty.
  2. The floor will then be re-cleaned with plain water. If required by the Owner or the HPM, the floors could require 'neutralization' of any and all chemicals used. If this is to be performed, the neutralization will be carried out after the area has satisfied all clearance criteria.

### **3.8 Lead-Related Demolition Final Inspection**

- A. The Owner/HPM will perform a visual inspection of each lead work control area at the completion of each phase of lead-related demolition. The inspection will determine that all lead-containing dust and debris has been cleaned up and that all lead-containing materials have been removed, packaged, and placed into the proper waste containers. If the final visual inspection is not acceptable, the Contractor shall perform the cleanup procedures listed in Article 3.07 of this Section.
- B. The Owner/HPM will perform an inspection of the soil surrounding the building. No visible paint chips or lead-containing debris shall be present in the soil. If paint chips or debris are identified in the soil, the Contractor shall remove these using manual methods and HEPA vacuums.
- C. Final Inspection: Following completion of all phases of lead-related demolition, the Owner will perform a FINAL visual inspection of any items remaining in the work area including wall and deck support systems and the concrete slab.
1. All paint/lead containing waste is to be removed from work area by the end of each workday. Accumulated waste will not be allowed to remain in the area overnight. Plastic barriers, at entrances to the work areas, shall remain in place at all times until the area is scraped and cleared. Items requiring removal of lead-based paints intact shall be wrapped in one layer of polyethylene sheeting, sealed with duct tape and labeled properly prior to removal from the holding area.
  2. Visual Clearance Criteria for Lead Only Abatement Areas: At the end of each workday the HPM and the Contractor's Supervisor shall inspect work performed that day. If the visual inspection reveals that lead-contaminated wastes and loose debris have been adequately removed from the area, the Contractor will be allowed to commence work on the next work area. If the HPM determines that unacceptable waste and residue remain, the Contractor shall vacuum and re-clean those areas that are unsatisfactory. The Contractor will not be allowed to start removal in the next work area until the existing/current work area has passed a visual inspection.
  3. Wipe Sample Clearance, as deemed necessary by the HPM.
    - a. When the work is completed, the HPM will visually inspect the zone for any loose dust or debris, followed by wipe sampling of settled dust to document surface lead levels below the specified clearance levels. Samples will be collected using commercial wipes moistened with a non-alcohol wetting agent. A one-foot

square area will be wiped twice in an "S" pattern, the second pass being at right angles to the first, folding the wipe inward and placing it in a labeled sample container. The wipe sample will be analyzed by flame atomic absorption using EPA method SW846. The Contractor shall re-clean the zone if surface concentrations exceed the following:

- 40 µg/ft<sup>2</sup>.....for floors.
- 250 µg/ ft<sup>2</sup>.....for interior windowsills and stools.
- 400 µg/ft<sup>2</sup>.....for window troughs.
- 400 µg/ ft<sup>2</sup>.....for exterior concrete or other rough surfaces.
- 350 ppm .....for soil (or the pre-existing 'baseline' level, whichever is lower).

- b. The cleaning and testing will cease only after all required paints are abated and all sample results are below these specified levels. Sample analysis times will be within 1 workday, unless otherwise indicated.
  - c. If the above levels are enumerated in paragraph 3 a above are exceeded, the final testing procedure shall then be repeated at Contractor's expense. This shall include, but not be limited to, the sampling and analysis costs for the samples during re-cleaning and the final clearance, HazMat Project Manager's costs and expenses, any and all contractual penalties, liquidated damages, etc., levied by the owner and/or other trades that may be impacted by the change in schedule.
4. Air Sampling Criteria (As Applicable): Aggressive air sampling will be conducted for lead simultaneous to the asbestos clearance air sampling. Air samples will be analyzed for total lead in accordance with Lead in Air by Flame AAS NIOSH method 7082. The clearance criterion for lead shall be an airborne concentration below OSHA's "Action Level" of 30 micrograms per cubic meter of lead (30 µg/m<sup>3</sup>), on an 8 hour Time Weighted Average (TWA), for all samples.

### **3.9 Lead Waste Handling Procedures**

- A. All disposable personal protective equipment, respirator cartridges, and HEPA vacuum filters shall be packaged and disposed of upon completion of the work shift and when the lead removal operation has been completed.
- B. All removed lead-containing materials, lead-contaminated clothing and equipment, and lead-containing dust/debris shall be packaged and placed into waste containers approved for use by both the waste transporter and landfill.
- C. Properly label each lead waste container in accordance with the requirements of the waste hauler and the landfill. At a minimum, the labels shall identify the type of waste and the date lead-contaminated wastes were first put into the container.
- D. The Contractor shall make provisions for the safe storage of waste on site for waste characterization and eventual disposal. For health and safety reasons, waste storage areas must be treated as lead work control areas with restricted access.

### **3.10 Lead Waste Disposal**

- A. The Contractor shall perform at their expense, any and all waste characterization and analysis of lead-containing waste or lead-contaminated waste generated during this project. The waste characterization sampling performed on the waste will be in accordance with Title 22.
- B. Any and all waste including but not limited to waste generated from abatement projects, demolition debris and/or soil excavation, with total lead content greater than 350 parts per million and scheduled for disposal in California, must be disposed of at a Class I hazardous waste landfill, or at other landfills that have specific permits to accept these waste. Copies of all waste permits from the waste disposal facility shall be included as a part of the pre-job submittal.

- C. For all waste generated from the site one or more of the following characterization tests must be performed:

Total Threshold Limit Concentration (TTLC) (California State Requirement)	<p>(a) If greater than or equal to 1000 mg/kg the waste must be disposed as a Class I Hazardous Waste,</p> <p>(b) If less than 1000 mg/kg but greater than or equal to 50 mg/kg then perform the W.E.T.(STLC) test,</p> <p>(c) If less than 50 mg/kg can be disposed of as construction debris</p>
Waste Extraction Test Soluble Threshold Limit Concentration (WET-STLC) (California State Requirement)	<p>(a) If greater than or equal to 5mg/l the waste must be disposed as a Class I Hazardous Waste after performing the TCLP Test (Federal)</p> <p>(b) If less than 5 mg/l can be disposed of as construction debris.</p>
Toxicity Characteristic Leachate Procedure (TCLP) (Federally Regulated)	<p>(a) If greater than or equal to 5mg/l the waste must be stabilized prior to being disposed as a Class I Hazardous Waste</p> <p>(b) If less than 5mg/l the waste stabilization is not required. However the material must be disposed as a Class I Hazardous Waste</p>

### 3.11 OSHA Personnel Air Monitoring

- A. Air monitoring required by OSHA for lead exposure is work of the contractor. The contractor is responsible for providing daily OSHA compliance monitoring as per 29 CFR Part 1926.62 and 8 CCR Part 1532.1.
1. At minimum, Contractor shall conduct representative (25% of crew) breathing zone personal air monitoring of its employees twice each shift and repeated daily.
  2. Monitoring shall be conducted by a qualified professional experienced and knowledgeable about the methods of air monitoring and in accordance with 29 CFR Part 1926.62 and 8 CCR Part 1532.1.
  3. Monitoring results and appropriate laboratory analysis work shall be submitted to Owner's Representative within twenty-four (24) hours of the monitoring work.

### 3.12 Alternate Procedures

- A. The procedures described in this Section shall be utilized at all times.
- B. If specified procedures cannot be utilized, a request shall be made in writing to the Owner providing details of the problem encountered and proposed alternatives.
- C. Alternative procedures shall provide equivalent or greater protection than the procedures that they replace.
- D. Alternative procedure shall be approved in writing by the Owner and HazMat Project Manager prior to implementation.

**APPENDIX –A**  
**SCOPE OF WORK**

## APPENDIX –A

### SCOPE OF WORK

#### SHEET NOTES FOR THE ABATEMENT SCOPE OF WORK

The following notes will apply in their entirety, without exclusions or exemptions, to the entire Scope of Work for this Project unless otherwise instructed to in writing:

1. These Buildings are slated for renovation and/or reconfiguration. Coordinate work activities with HPM, Construction Manager and other trades as applicable. Prior to the commencement of abatement or removal activities, it is the Contractors responsibility to reconcile all the abatement/removal scope of work materials and locations listed herein with the intent of the Project Construction Manager and/or the Owners Representative.
2. The Contractor shall be responsible for independently verifying ALL quantities enumerated and include all costs in their base bid.
3. The Contractor shall be responsible for the abatement/removal of ALL LISTED MATERIALS - IN ALL LOCATIONS as indicated in these documents.
4. The Contractor shall be responsible for the quantification of all materials actually removed from ALL LOCATIONS.
5. Any and all items that are left in/on the Building(s) that may be affected by of this Scope of Work are to be protected in place unless otherwise directed (in writing) by the Owner or the Owners designee.
6. These Scopes of Work are created on the basis of the Architectural Drawings and/or the information received from the Owner/the Owners representative. It is restricted to those materials surfaces and quantities that are designated to be impacted during the modernization. This is not a complete inventory of all known or suspect hazardous materials in these areas, nor should it be construed to be a comprehensive hazardous materials report for these work areas.

#### **Lead Abatement/ Removal Scope of Work Notes:**

- a) All items enumerated are to be removed in accordance with Section 02 83 00 of the attached Specifications and in full compliance with current Local, State and Federal regulations. In the event of a conflict between the regulations and the specifications, the most stringent shall apply.

- b) Special Removal and Disposal Instructions:

##### (i) In Areas for Removal

Remove and Dispose of Material/Component as Lead Containing Waste to framing, including any insulation materials; framing to be cleaned and remain intact.

NOTE: If Lead Coated Metal Components are to be “recycled” instead of being disposed of as Lead Containing Waste, the Contractor must – (I) provide the owner with documentation from the Metal Recycler, confirming acceptance of known Lead Coated materials; (II) transport these materials under proper manifest/trip ticket; and (III) provide a copy of the trip ticket signed by the Recycler, proving appropriate disposal of the Scope of Work Item(s).

##### (ii) In areas for Modification/Attachment

Remove all Layers of Paint and Dispose of as Lead Containing Waste. Stabilize (‘Coat’ Over) leading edge of removed area with an approved “Sealant” to enable Prep, Priming, and Repainting by Others. For anticipated welding, torching or other ‘hot work’ on metal remove all layers of paint to bare metal at a minimum of 18 inches on each side of (on all faces of the metal) the anticipated work.

##### (iii) In Areas for Repainting

Manually Abrade/Scrape all accessible surfaces in their entirety, being careful to remove all ‘peeling-chipping’ paint. Manually Wash/Scrub all ‘build-up’ (Chalking residue, Grime, etc.) from all accessible surfaces. Dispose of all Waste Products and Debris as Lead Containing Waste. Stabilize (‘Coat’ Over) exposed Substrate with an approved “Sealant” to enable Prep, Priming, and Repainting by Others.

## LEAD SCOPE OF WORK

March 28, 2017

### JAMES LICK HIGH SCHOOL

Administration Building

**Page 1 of 1**

All items enumerated below are to be removed and disposed of as Lead Containing Waste unless otherwise noted.

<u>ITEM #</u>	<u>LOCATION / MATERIAL</u>	<u>APPROXIMATE QUANTITY*</u>
1.	Roof of the Administration Building / Gray Lead Metal Sleeves around Roof Penetrations *** See Special Removal and Disposal Instructions. ***	≈ 34 EA

#### NOTES

- A. REFER TO APPENDIX -A SCOPE OF WORK SHEET NOTES FOR ALL RELEVANT DIRECTIONS/INSTRUCTIONS FOR THIS SCOPE OF WORK.

Key: SF= Square Feet; LF=Linear Feet; EA=Each



## LEAD SCOPE OF WORK

March 28, 2017

### JAMES LICK HIGH SCHOOL

Canopy between the Administration and the Gym Building

**Page 1 of 1**

All items enumerated below are to be removed and disposed of as Lead Containing Waste unless otherwise noted.

<u>ITEM #</u>	<u>LOCATION / MATERIAL</u>	<u>APPROXIMATE QUANTITY*</u>
1.	Roof of the Canopy between the Administration Building and the Gym Building / Gray Lead Metal Sleeves around Roof Penetrations *** See Special Removal and Disposal Instructions. ***	≈ 10 EA
2.	Roof of the Canopy between the Administration Building and the Gym Building / Green Painted Metal Gutters and Roof Flashing *** See Special Removal and Disposal Instructions. ***	≈ 680 LF
3.	Roof of the Canopy between the Administration Building and the Gym Building / Green Painted Wood Fascia *** See Special Removal and Disposal Instructions. ***	≈ 680 LF

#### NOTES

- A. REFER TO APPENDIX -A SCOPE OF WORK SHEET NOTES FOR ALL RELEVANT DIRECTIONS/INSTRUCTIONS FOR THIS SCOPE OF WORK.

Key: SF= Square Feet; LF=Linear Feet; EA=Each

## LEAD SCOPE OF WORK

March 28, 2017

### JAMES LICK HIGH SCHOOL

Main Gym Building (Building 1200)

Page 1 of 1

All items enumerated below are to be removed and disposed of as Lead Containing Waste unless otherwise noted.

<u>ITEM #</u>	<u>LOCATION / MATERIAL</u>	<u>APPROXIMATE QUANTITY*</u>
1.	Roof of the Entire Main Gym Building (Building 1200) / Gray Lead Metal Sleeves around Roof Penetrations *** See Special Removal and Disposal Instructions. ***	≈ 48 EA
2.	Roof of the Entire Main Gym Building (Building 1200) / Metal Flashing (Wall Cap) on the vertical Walls *** See Special Removal and Disposal Instructions. ***	≈ 580 SF
3.	Roof of the Entire Main Gym Building (Building 1200) / White Painted Wood Walls *** See Special Removal and Disposal Instructions. ***	≈ 4,000 SF
4.	Roof of the Entire Main Gym Building (Building 1200) / White Painted Metal Flashing Material on the Roof and the Walls *** See Special Removal and Disposal Instructions. ***	≈ 800 SF
5.	Roof of the Entire Main Gym Building (Building 1200) / Green Painted Metal Gutters *** See Special Removal and Disposal Instructions. ***	≈ 900 LF
6.	Exterior of the Entire Main Gym Building (Building 1200) / White Painted Metal Downspouts *** See Special Removal and Disposal Instructions. ***	≈ 20 EA (7' EA)
7.	Roof of the Entire Main Gym Building (Building 1200) / Green Painted Concrete Walls *** See Special Removal and Disposal Instructions. ***	≈ 300 SF
8.	Roof of the Entire Main Gym Building (Building 1200) / Green Painted Wood Fascia *** See Special Removal and Disposal Instructions. ***	≈ 1,180 SF
9.	Roof of the Mechanical and Storage Area (Building 1200) / White Painted Concrete Parapet Wall *** See Special Removal and Disposal Instructions. ***	≈ 400 SF
10.	Roof of the Mechanical and Storage Area (Building 1200) / White Painted Metal Flashing for the Parapet Wall *** See Special Removal and Disposal Instructions. ***	≈ 100 LF

#### NOTES

- A. REFER TO APPENDIX -A SCOPE OF WORK SHEET NOTES FOR ALL RELEVANT DIRECTIONS/INSTRUCTIONS FOR THIS SCOPE OF WORK.

Key: SF= Square Feet; LF=Linear Feet; EA=Each

**APPENDIX –B**

**LABORATORY ANALYSIS  
FOR  
ASBESTOS AND LEAD SAMPLES**



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EMSL Order: 091705763

Customer ID: HAZM63

Customer PO: 17-056

Project ID:

Attention: Maheen B. Doctor

HazMat Doc

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Received Date: 03/25/2017 9:00 AM

Analysis Date: 03/26/2017

Collected Date: 03/23/2017

Project: 17-056 - EAST SIDE UNION HIGH SCHOOL DISTRICT - JAMES LICK HIGH SCHOOL [FHO-030-811]

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-01-Roll Sheet 091705763-0001	ADMIN BLDG. ROOF CORE, ROIL SHEET + BLACK MASTIC, TOP LAYER	Black Fibrous Homogeneous	7% Glass	60% Matrix 33% Non-fibrous (Other)	None Detected
JR-01-Mastic 091705763-0001A	ADMIN BLDG. ROOF CORE, ROIL SHEET + BLACK MASTIC, TOP LAYER	Black Non-Fibrous Homogeneous		70% Matrix 30% Non-fibrous (Other)	None Detected
JR-02-Felt Paper 091705763-0002	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 2ND LAYER	Black Fibrous Homogeneous	12% Glass	60% Matrix 28% Non-fibrous (Other)	None Detected
JR-02-Mastic 091705763-0002A	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 2ND LAYER	Black Non-Fibrous Homogeneous		60% Matrix 40% Non-fibrous (Other)	None Detected
JR-03-Felt Paper 091705763-0003	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 3RD LAYER	Black Fibrous Homogeneous	5% Cellulose 8% Glass	60% Matrix 27% Non-fibrous (Other)	None Detected
JR-03-Mastic 091705763-0003A	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 3RD LAYER	Black Non-Fibrous Homogeneous		70% Matrix 30% Non-fibrous (Other)	None Detected
JR-04 Felt Paper 091705763-0004	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 4TH LAYER	Black Fibrous Homogeneous	85% Cellulose 5% Glass	10% Non-fibrous (Other)	None Detected
JR-04 Mastic 091705763-0004A	ADMIN BLDG. ROOF CORE, BLACK FELT PAPER + MASTIC, 4TH LAYER	Black Non-Fibrous Homogeneous		60% Matrix 40% Non-fibrous (Other)	None Detected
JR-05 091705763-0005	ADMIN BLDG. ROOF CORE, PINK BROWN PAPER, BOTTOM LAYER	Pink Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected
JR-06 091705763-0006	ADMIN BLDG. ROOF GRAY + BLACK PENETRATION SEALANT	Gray/Black Fibrous Homogeneous	25% Cellulose	70% Matrix 5% Non-fibrous (Other)	None Detected
JR-07-Roof Sheet 091705763-0007	ADMIN BLDG. ROOF HALLWAY/PATH, ROOF SHEET + BLACK MASTIC	Black Fibrous Homogeneous	10% Glass	60% Matrix 30% Non-fibrous (Other)	None Detected
JR-07-Mastic 091705763-0007A	ADMIN BLDG. ROOF HALLWAY/PATH, ROOF SHEET + BLACK MASTIC	Black Non-Fibrous Homogeneous		70% Matrix 30% Non-fibrous (Other)	None Detected

Initial report from: 03/26/2017 18:32:24



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**Customer ID:** HAZM63

**Customer PO:** 17-056

**Project ID:**

Analyst(s)

*Beheshta Ahadi (12)*

Matthew Batongbacal  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 03/26/2017 18:32:24



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Project ID:

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Received Date: 03/25/2017 9:00 AM

Analysis Date: 03/26/2017

Collected Date: 03/23/2017

Project: 17-056 - EAST SIDE UNION HIGH SCHOOL DISTRICT - JAMES LICK HIGH SCHOOL [FHO-030-811]

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-08-Roll Sheet 091705765-0001	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, ROLL SHEET + BLACK MASTIC, TOP LAYER	White/Black Fibrous Homogeneous	20% Glass	15% Quartz 60% Matrix 5% Non-fibrous (Other)	None Detected
JR-08-Mastic 091705765-0001A	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, ROLL SHEET + BLACK MASTIC, TOP LAYER	Black Non-Fibrous Homogeneous		60% Matrix 40% Non-fibrous (Other)	None Detected
JR-09-Felt Paper 091705765-0002	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK FELT PAPER + MASTIC, 2ND LAYER	Black Fibrous Homogeneous	16% Glass	60% Matrix 24% Non-fibrous (Other)	None Detected
JR-09-Mastic 091705765-0002A	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK FELT PAPER + MASTIC, 2ND LAYER	Black Non-Fibrous Homogeneous		70% Matrix 30% Non-fibrous (Other)	None Detected
JR-10-Felt Paper 091705765-0003	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK FELT PAPER + MASTIC, 3RD LAYER	Black Fibrous Homogeneous	17% Glass	70% Matrix 13% Non-fibrous (Other)	None Detected
JR-10-Mastic 091705765-0003A	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK FELT PAPER + MASTIC, 3RD LAYER	Black Non-Fibrous Homogeneous		70% Matrix 30% Non-fibrous (Other)	None Detected
JR-11-Paper 091705765-0004	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK PAPER + WHITE INSULATION, BOTTOM LAYER	Black Fibrous Homogeneous	5% Glass	60% Matrix 35% Non-fibrous (Other)	None Detected
JR-11-Insulation 091705765-0004A	CANOPY BETWEEN ADMIN + GYM, ROOF CORE, BLACK PAPER + WHITE INSULATION, BOTTOM LAYER	White Fibrous Homogeneous	17% Glass	70% Gypsum 13% Non-fibrous (Other)	None Detected

Report amended: 03/27/2017 10:44:12 Replaces initial report from: 03/26/2017 18:36:35 Reason Code: Client-Change to Sample ID



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EMSL Order: 091705765

Customer ID: HAZM63

Customer PO: 17-056

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-12 091705765-0005	CANOPY BETWEEN ADMIN + GYM, ROOF GRAY + BLACK PENETRATION SEALANT	Black Fibrous Homogeneous	15% Cellulose	70% Matrix 15% Non-fibrous (Other)	None Detected
JR-13 091705765-0006	CANOPY BETWEEN ADMIN + GYM, ROOF JOINT BLACK FLASHING + MASTIC	Black Fibrous Homogeneous	4% Cellulose	70% Matrix 26% Non-fibrous (Other)	None Detected
JR-14 091705765-0007	CANOPY BETWEEN ADMIN + GYM, ROOF JOINT FLASHING, WHITE GRAY BLACK SEALANT	Gray/Black Fibrous Homogeneous	10% Cellulose	70% Matrix 20% Non-fibrous (Other)	None Detected

Analyst(s)

Beheshta Ahadi (11)

Matthew Batongbacal  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Report amended: 03/27/2017 10:44:12 Replaces initial report from: 03/26/2017 18:36:35 Reason Code: Client-Change to Sample ID



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EMSL Order: 091705788

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Attention: Zen Doctor

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Received Date: 03/25/2017 9:00 AM

Analysis Date: 03/26/2017

Collected Date:

Project: 17-056 - East Side Union High School District - James Lick High School (F40-030-811)

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-15-Roll Sheet 091705788-0001	Bldg 1200, Boys Locker Room Roof Core Roll Sheet + Black Mastic Top Layer	Black Fibrous Homogeneous	10% Glass	10% Quartz 70% Matrix 10% Non-fibrous (Other)	None Detected
JR-15-Mastic 091705788-0001A	Bldg 1200, Boys Locker Room Roof Core Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-16-Felt 091705788-0002	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 2nd Layer	Black Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-16-Mastic 091705788-0002A	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 2nd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-17-Felt 091705788-0003	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 3rd Layer	Black Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-17-Mastic 091705788-0003A	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 3rd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-18-Felt 091705788-0004	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 4th Layer	Black Fibrous Homogeneous	10% Glass	5% Ca Carbonate 70% Matrix 15% Non-fibrous (Other)	None Detected
JR-18-Mastic 091705788-0004A	Bldg 1200 Boys Locker Room Roof Core Black Felt Paper+Mastic 4th Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-19 091705788-0005	Bldg 1200 Boys Locker Room Roof Core White Roof Insulation Bottom Layer	White Fibrous Homogeneous	20% Glass	70% Gypsum 10% Non-fibrous (Other)	None Detected
JR-20 091705788-0006	Bldg 1200 Boys Locker Room Roof White Gray + Black Penetration Sealant	White/Black Non-Fibrous Homogeneous	10% Cellulose	70% Matrix 20% Non-fibrous (Other)	None Detected

Initial report from: 03/26/2017 13:24:23





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EMSL Order: 091705788

Customer ID: HAZM63

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-21-Flashing 091705788-0007	Bldg 1200 Boys Locker Room Roof Skylight Roof Flashing + Black Mastic	Black Non-Fibrous Homogeneous	5% Cellulose 5% Glass	5% Quartz 70% Matrix 15% Non-fibrous (Other)	None Detected
JR-21-Mastic 091705788-0007A	Bldg 1200 Boys Locker Room Roof Skylight Roof Flashing + Black Mastic	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-22 091705788-0008	Bldg 1200 Boys Locker Room Roof HVAC Duct Joint Gray Sealant	Gray Non-Fibrous Homogeneous		70% Ca Carbonate 30% Non-fibrous (Other)	None Detected
JR-23 091705788-0009	Bldg 1200 Gym Top Level Roof Tile, Top Layer	Black Non-Fibrous Homogeneous	2% Glass	10% Ca Carbonate 70% Matrix 18% Non-fibrous (Other)	None Detected
JR-24 091705788-0010	Bldg 1200 Gym Top Level Roof Tile, 2nd Layer	Black Fibrous Homogeneous	5% Glass	15% Ca Carbonate 70% Matrix 10% Non-fibrous (Other)	None Detected
JR-25 091705788-0011	Bldg 1200 Gym Top Level Black Felt Paper Bottom Layer	Black Fibrous Homogeneous	20% Cellulose	70% Matrix 10% Non-fibrous (Other)	None Detected
JR-26 091705788-0012	Bldg 1200 Gym Top Level Roof Metal Flashing Joint Gray + Black Sealant	Gray/Black Non-Fibrous Homogeneous	20% Cellulose 2% Synthetic	70% Matrix 8% Non-fibrous (Other)	None Detected
JR-27 091705788-0013	Bldg 1200 Gym Lower Level Wood Parapet Wall White Paint Texture	White Non-Fibrous Homogeneous		5% Quartz 30% Ca Carbonate 40% Matrix 25% Non-fibrous (Other)	None Detected
JR-28 091705788-0014	Bldg 1200 Gym Lower Level Roof Tile Top Layer	Black Non-Fibrous Homogeneous	5% Glass	15% Ca Carbonate 70% Matrix 10% Non-fibrous (Other)	None Detected
JR-29 091705788-0015	Bldg 1200 Gym Lower Level Roof Tile 2nd Layer	Black Non-Fibrous Homogeneous	5% Glass	15% Ca Carbonate 70% Matrix 10% Non-fibrous (Other)	None Detected
JR-30 091705788-0016	Bldg 1200 Gym Lower Level Black Felt Paper Bottom Layer	Black Fibrous Homogeneous	30% Cellulose	60% Matrix 10% Non-fibrous (Other)	None Detected
JR-31-Roll Sheet 091705788-0017	Bldg 1200 Gym Lower Level Roll Sheet + Black Mastic Top Layer	Black Fibrous Homogeneous		5% Quartz 15% Ca Carbonate 60% Matrix 20% Non-fibrous (Other)	None Detected
JR-31-Mastic 091705788-0017A	Bldg 1200 Gym Lower Level Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous		10% Ca Carbonate 70% Matrix 20% Non-fibrous (Other)	None Detected
JR-32-Felt 091705788-0018	Bldg 1200 Gym Lower Level Black Felt Paper + Mastic Bottom Layer	Black Non-Fibrous Homogeneous	10% Cellulose	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-32-Mastic 091705788-0018A	Bldg 1200 Gym Lower Level Black Felt Paper + Mastic Bottom Layer	Black Non-Fibrous Homogeneous		10% Ca Carbonate 70% Matrix 20% Non-fibrous (Other)	None Detected

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EMSL Order: 091705788

Customer ID: HAZM63

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-33 091705788-0019	Bldg 1200 Gym Lower Level Roof Gray+Black Penetration Sealant	Gray Non-Fibrous Homogeneous	15% Cellulose	70% Matrix 15% Non-fibrous (Other)	None Detected
JR-34-Roll Sheet 091705788-0020	Bldg 1200 Weight Room + Wrestling Room, Roof Core Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous	5% Glass	15% Quartz 70% Matrix 10% Non-fibrous (Other)	None Detected
JR-34-Mastic 091705788-0020A	Bldg 1200 Weight Room + Wrestling Room, Roof Core Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous		5% Quartz 70% Matrix 25% Non-fibrous (Other)	None Detected
JR-35-Felt 091705788-0021	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 2nd Layer	Black Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-35-Mastic 091705788-0021A	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 2nd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-36-Felt 091705788-0022	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 3rd Layer	Black Non-Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-36-Mastic 091705788-0022A	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 3rd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-37-Felt 091705788-0023	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 4th Layer	Black Fibrous Homogeneous	10% Glass	5% Ca Carbonate 70% Matrix 15% Non-fibrous (Other)	None Detected
JR-37-Mastic 091705788-0023A	Bldg 1200 Weight Room + Wrestling Room, Roof Core Black Felt Paper + Mastic 4th Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-38 091705788-0024	Bldg 1200 Weight Room + Wrestling Room, Roof Core White Roof Insulation Bottom Layer	White Fibrous Homogeneous	10% Glass	70% Gypsum 20% Non-fibrous (Other)	None Detected
JR-39 091705788-0025	Bldg 1200 Weight Room + Wrestling Room, Roof Gray + Black Penetration Sealant	Gray/Black Non-Fibrous Homogeneous	15% Cellulose	70% Matrix 15% Non-fibrous (Other)	None Detected
JR-40-Roof Sheet 091705788-0026	Bldg 1200 Weight Room + Wrestling Room, Roof Walkway/Path, Roof Sheet + Black Mastic	Black Non-Fibrous Homogeneous	10% Glass	15% Quartz 60% Matrix 15% Non-fibrous (Other)	None Detected

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EMSL Order: 091705788

Customer ID: HAZM63

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-40-Mastic 091705788-0026A	Bldg 1200 Weight Room + Wrestling Room, Roof Walkway/Path, Roof Sheet + Black Mastic	Black Non-Fibrous Homogeneous		10% Quartz 70% Matrix 20% Non-fibrous (Other)	None Detected
JR-41-Roll Sheet 091705788-0027	Bldg 1200 Girls Locker Room Roof Core Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous	10% Glass	5% Quartz 70% Matrix 15% Non-fibrous (Other)	None Detected
JR-41-Mastic 091705788-0027A	Bldg 1200 Girls Locker Room Roof Core Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-42-Felt 091705788-0028	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 2nd Layer	Black Non-Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-42-Mastic 091705788-0028A	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 2nd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-43-Felt 091705788-0029	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 3rd Layer	Black Non-Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-43-Mastic 091705788-0029A	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 3rd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-44-Felt 091705788-0030	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 4th Layer	Black Non-Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-44-Mastic 091705788-0030A	Bldg 1200 Girls Locker Room Roof Core Black Felt Paper + Mastic 4th Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-45 091705788-0031	Bldg 1200 Girls Locker Room Roof Core White Roof Insulation Bottom Layer	White Non-Fibrous Homogeneous	15% Glass	70% Gypsum 15% Non-fibrous (Other)	None Detected
JR-46 091705788-0032	Bldg 1200 Girls Locker Room Roof White Gray + Black Penetration Sealant	White/Black Non-Fibrous Homogeneous	20% Cellulose	70% Matrix 10% Non-fibrous (Other)	None Detected
JR-47-Flashing 091705788-0033	Bldg 1200 Girls Locker Room Skylight Roof Flashing + Black Mastic	Black Non-Fibrous Homogeneous	10% Glass	5% Quartz 10% Ca Carbonate 60% Matrix 15% Non-fibrous (Other)	None Detected
JR-47-Mastic 091705788-0033A	Bldg 1200 Girls Locker Room Skylight Roof Flashing + Black Mastic	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected

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EMSL Order: 091705788

Customer ID: HAZM63

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
JR-48-Roll Sheet  091705788-0034	Bldg 1200 Mech/Storage Room, Roof Core, Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous	10% Glass	5% Quartz 70% Matrix 15% Non-fibrous (Other)	None Detected
JR-48-Mastic  091705788-0034A	Bldg 1200 Mech/Storage Room, Roof Core, Roll Sheet + Black Mastic Top Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-49-Felt  091705788-0035	Bldg 1200 Mech/Storage Room, Roof Core Black Felt + Mastic 2nd Layer	Black Non-Fibrous Homogeneous	10% Glass	70% Matrix 20% Non-fibrous (Other)	None Detected
JR-49-Mastic  091705788-0035A	Bldg 1200 Mech/Storage Room, Roof Core Black Felt + Mastic 2nd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-50-Felt  091705788-0036	Bldg 1200 Mech/Storage Room, Roof Core Black Felt + Mastic 3rd Layer	Brown/Black Non-Fibrous Homogeneous	20% Cellulose 5% Glass	60% Matrix 15% Non-fibrous (Other)	None Detected
JR-50-Mastic  091705788-0036A	Bldg 1200 Mech/Storage Room, Roof Core Black Felt + Mastic 3rd Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-51  091705788-0037	Bldg 1200, Mech/Storage Room Roof Core Brown Roof Insulation 4th Layer	Brown Non-Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
JR-52-Felt  091705788-0038	Bldg 1200 Mech/Storage Room, Roof Core Black Felt Paper + Mastic Bottom Layer	Brown/Black Non-Fibrous Homogeneous	20% Cellulose 5% Glass	60% Matrix 15% Non-fibrous (Other)	None Detected
JR-52-Mastic  091705788-0038A	Bldg 1200 Mech/Storage Room, Roof Core Black Felt Paper + Mastic Bottom Layer	Black Non-Fibrous Homogeneous		90% Matrix 10% Non-fibrous (Other)	None Detected
JR-53  091705788-0039	Bldg 1200 Mech/Storage Room, Roof White Gray + Black Penetration Sealant	Gray/Black Non-Fibrous Homogeneous	15% Cellulose	70% Matrix 15% Non-fibrous (Other)	None Detected



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Customer ID: HAZM63

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Project ID:

Analyst(s)

Shane Heisser (60)

Matthew Batongbacal  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 03/26/2017 13:24:23

**EMSL Analytical, Inc**

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EMSL Order: 091705818

CustomerID: HAZM63

CustomerPO: 17-056

ProjectID:

Attn: **HazMat Doc**  
**3080 Olcott Street**  
**Suite 135D**  
**Santa Clara, CA 95054**

Phone: (408) 748-0055  
Fax: (408) 748-0066  
Received: 03/25/17 9:00 AM  
Collected:

Project: 17-056 EAST SIDE UNION HIGH SCHOOL DISTRICT. JAMES LICK HIGH SCHOOL (FHO-030-811)

**Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\***

<i>Client Sample Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>
JR-54 091705818-0001		3/27/2017 Site: ADMIN BLDG, NORTHWEST, EXTERIOR METAL ROOF FLASHING, WHITE	100 ppm	<100 ppm
JR-55 091705818-0002		3/27/2017 Site: CANOPY BETWEEN ADMIN + GYM BLDG, NORTH WEST, EXTERIOR METAL GUTTER + FLASHING, GREEN	100 ppm	660 ppm
JR-56 091705818-0003		3/27/2017 Site: CANOPY BETWEEN ADMIN + GYM BLDG, NORTH WEST, EXTERIOR WOOD FASCIA, GREEN	2500 ppm	16000 ppm
JR-57 091705818-0004		3/27/2017 Site: BLDG 1200, GYM, NORTHWEST, EXTERIOR METAL WALL TOP CAP FLASHING, GREEN	25000 ppm	58000 ppm
JR-58 091705818-0005		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR METAL WOOD WALL, WHITE	2000 ppm	19000 ppm
JR-59 091705818-0006		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR METAL ROOF + WALL FLASHING, WHITE	25000 ppm	67000 ppm
JR-60 091705818-0007		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR METAL GUTTER, GREEN	25000 ppm	58000 ppm
JR-61 091705818-0008		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR METAL DOWNSPOUT, WHITE	5000 ppm	32000 ppm
JR-62 091705818-0009		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR CONCRETE WALL, GREEN	2000 ppm	12000 ppm

Julian Neagu, Lead Laboratory Manager  
or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA A2LA Accredited Environmental Testing Cert #2845.09

Report Amended: 03/28/2017 11:20:48 Replaces Report Amended: 03/28/2017 11:19:34. Reason Code: Data Entry-Change to Appearance

**EMSL Analytical, Inc**

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EMSL Order: 091705818

CustomerID: HAZM63

CustomerPO: 17-056

ProjectID:

Attn: **HazMat Doc**  
**3080 Olcott Street**  
**Suite 135D**  
**Santa Clara, CA 95054**

Phone: (408) 748-0055  
Fax: (408) 748-0066  
Received: 03/25/17 9:00 AM  
Collected:

Project: 17-056 EAST SIDE UNION HIGH SCHOOL DISTRICT. JAMES LICK HIGH SCHOOL (FHO-030-811)

**Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\***

<i>Client Sample Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>
JR-63 091705818-0010		3/27/2017 Site: BLDG 1200 GYM, NORTHWEST, EXTERIOR WOOD FASCIA, GREEN	25000 ppm	44000 ppm
JR-64 091705818-0011		3/27/2017 Site: BLDG 1200 WRESTLING ROOM, SOUTHWEST, EXTERIOR METAL ROOF FLASHING, GREEN	100 ppm	<100 ppm
JR-65 091705818-0012		3/27/2017 Site: BLDG 1200 WRESTLING ROOM, SOUTHWEST EXTERIOR WOOD FASCIA, GREEN	5000 ppm	37000 ppm
JR-66 091705818-0013		3/27/2017 Site: BLDG 1200 MECH./STORAGE ROOM, SOUTHWEST, EXTERIOR CONCRETE PARAPET WALL + METAL FLASHING, WHITE	1000 ppm	4200 ppm

Julian Neagu, Lead Laboratory Manager  
or other approved signatory

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Report Amended: 03/28/2017 11:20:48 Replaces Report Amended: 03/28/2017 11:19:34. Reason Code: Data Entry-Change to Appearance

**SECTION 06 10 00**  
**ROUGH CARPENTRY**

**PART 1 – GENERAL**

**1.01 SCOPE OF WORK:**

- A. Supply and install all lumber as specified herein and as required by the roof system manufacturer to qualify for the specified warranty. Work under this section shall be bid as a unit cost as described below.
- B. Work includes:
  - 1. Wood deck repair (\$/square foot)
  - 2. Wood deck replacement. (\$/plywood sheet 4x8)
  - 3. Wood parapet wall repair (\$/square foot)
  - 4. Wood parapet wall replacement (\$/plywood sheet 4x8)
  - 5. Below wood deck framing replacement (\$/linear foot for each below). Include cost of specified hangers.
    - a. 2x4
    - b. 2x6
    - c. 2x8
    - d. 2x10
    - e. 2x12
    - f. 4x6
    - g. 6x6
  - 6. Wood fascia board replacement (\$/linear foot for each below).
    - a. 2x8
    - b. 2x10
    - c. 2x12
  - 7. Wood nailer installation. Costs for wood nailers shall be included in the base bid for this project.
    - a. Install on all parapet walls and perimeter edges. Refer to detail drawings.
    - b. Install wherever required by the roof system manufacturer including at projections and curbs.
    - c. If nailers are present, contractor may re-use if approved by the District, Engineer, and roof system manufacturer. However, for purposes of bidding, include replacement/installation of nailers as described above.



8. Wood curb installation.

**1.02 DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas as directed by owner. Keep free of stain or other damage. Replace any damaged material at no cost to owner. When ready to install, plywood shall be placed on the roof in small stacks over column locations until applied.

**1.03 TECHNICAL SUBMITTALS**

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or drawings shall be approved by the engineer and owner prior to implementation.
- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the owner or engineer:
  - 1. Manufacturer specification data sheets. Submit for the following products:
    - a. Lumber.
    - b. Fasteners.
    - c. Hangers and brackets.
    - d. Any other product used under this section.
  - 2. Manufacturer literature describing the installation procedure of the specified system.
  - 3. Letter from manufacturer approving these specifications and drawings. Any changes in plans or specs to meet manufacturer requirements shall be submitted and highlighted. If manufacturer requirements conflict with these specifications or drawings, more stringent requirements will apply.
  - 4. Shop drawings of any details that may be different than the NRCA standard details included in these specifications. This includes manufacturer detail drawings that may be different than NRCA drawings. All flashing detail designs shall be approved by the Owner.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store materials in dry, protected areas as directed by owner. Keep free of stain or other damage. Replace any damaged material at no cost to owner.
- B. Store flat and keep dry and covered prior to installation.
- C. Installing wet or saturated material may result in shrinkage at butt joints.
- D. Store products in manufacturer's unopened packaging until ready for installation.

#### **1.05 PROJECT CONDITIONS**

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

#### **1.08 WARRANTY**

- A. Workmanship Warranty: Contractor shall provide to Owner a warranty covering defective workmanship for a period of five (5) years. This warranty shall be written on the contractor's letterhead or format and shall be independent of required bonds for this project.

### **PART 2 - MATERIALS**

#### **2.01 LUMBER:**

- A. Lumber shall be dry and well seasoned. The moisture content shall not exceed 19% in boards 8" or less in depth, 15% in lumber more than 8" in depth and plywood.
- B. Lumber herein referred to shall be graded and grade marked and shall conform to the following specifications, as applicable. All material shall be new.
  - 1. Douglas Fir Select Structural I. Per standard grading and dressing rules #16 of the West Coast Lumber Inspection Bureau (WCLIB).
  - 2. Plywood: Replacement sheathing, Structural I, CD (exterior glue) shall conform to the requirements designed in American Plywood Association, US Production Standard for soft plywood. Each Standard

PS 1-74 size panel shall be stamped with appropriate grade marking, visibly shown.

3. Wood Nailers: Pressure treated Douglas Fir.

## **2.02 FASTENERS AND CONNECTORS**

- A. Metal connectors (Joist hangers) for joist fastenings to supports shall be by Simpson Company of San Leandro, California or approved equal. Where Simpson hangers or brackets are used, contractor shall use corresponding Simpson nails or screws.
- B. All nails for fastening plywood to roof supports shall be common nails: flat head, diamond point, hot-dipped galvanized. All nails shall be hot-dip galvanized.
- C. Wood Nailers: Screws shall be coated #12. Length sufficient to penetrate steel or wood decking.

## **2.03 TALL PARAPET WALL UNDERLAYMENT**

- A. Any of the following:
  1. ASTM D 4869, Type II, non-perforated asphalt-saturated organic felts.
  2. Mineral Surfaced Roll Roofing: ASTM D 3909; 90 pound mineral surfaced; granules to match adjacent shingles.
  3. Smooth Surfaced Roll Roofing: ASTM D 224; 50 pound smooth surfaced roll roofing.
  4. Or approved equivalent.

## **PART 3 - EXECUTION**

### **3.01 WOOD MATERIALS:**

All materials shall be new when incorporated into the Work.

### **3.02 WORKMANSHIP:**

- A. The entire work of this division shall be performed in accordance with the best standards of practice relating to the trade and under the constant supervision of a competent foreman who shall carefully plan and lay out the work as required to carry out the intent of the drawings and to properly accommodate the work of other trades.

- B. All lumber framing shall be accurately cut and fitted into the respective location, true to lines, grades and level as indicated or required and permanently secured in proper position with spikes, or other fastenings or fittings as detailed to render the work substantial and rigid in all parts and connections.
- C. All framing shall comply with the requirements of the local building codes.

### **3.03 INSTALLATION OF WOOD NAILERS:**

- A. Install nailers to meet manufacturers wind uplift requirements per linear foot in any direction.
- B. If required by the manufacturer, install nailers at the perimeter, walls, and around curbs to furnish at the same height as the insulation.

### **3.04 PLYWOOD DECK REPAIR:**

Where nails are missing or loose or backed out, replace in like number with 8d nails or #12 screws.

### **3.05 PLYWOOD DECK REPLACEMENT:**

- A. Carefully remove damaged existing sheet(s).
- B. Cut or trim new sheets in order to fit. Match existing plywood thickness.
- C. Nail perimeter to substrate 5" O.C. using 8d nails.
- D. Interior nailing shall be 8" O.C. using 8d nails.

### **3.06 BELOW WOOD DECK FRAMING REPLACEMENT:**

- A. Carefully remove damaged existing lumber. Properly support structural members so as to prevent further damage.
- B. Cut or trim new lumber in order to fit. Match existing lumber size and thickness.
- C. Nail framing in place using 8d nails. Whenever appropriate, sister new lumber to existing purlins or sub-purlins.
- D. Wherever appropriate, install hangers. Follow manufacturer requirements for installation of all hangers and brackets.
- E. Framing members shall be accurately cut and fitted into the respective locations, true to lines, grades and level as indicated or required and permanently secured in proper position with spikes or other fastenings as

detailed, specified herein, or in full compliance with building codes.

**3.07 FASCIA BOARD REPLACEMENT:**

- A. Carefully remove damaged existing lumber(s).
- B. Cut or trim new lumber in order to fit. Match existing lumber size and thickness.
- C. Nail framing in place using 8d nails.

**3.08 PLYWOOD PARAPET WALL REPAIR:**

Where nails are missing or loose or backed out, replace in like number with 8d nails.

**3.09 PLYWOOD PARAPET WALL REPLACEMENT:**

- A. Carefully remove damaged existing sheet(s).
- B. Cut or trim new sheets in order to fit. Match existing plywood thickness.
- C. Install specified underlayment using approved mechanical fasteners.
- D. Nail perimeter to substrate 5" O.C. using 8d nails.
- D. Interior nailing shall be 8" O.C. using 8d nails.

**3.10 INSTALLATION OF WOOD CURB:**

- A. Fabricate and install wood box curb using 2X framing and ½" plywood.
- B. Dimensions of wood curb shall be appropriate to support equipment and encapsulate supply and return.
- C. Wood curb height shall be a minimum of 12" from final roof surface.
- D. If for an HVAC unit, interior framing shall enable interior air plenum for supply and return.
- E. Attach wood curb to deck structural members using Simpson L brackets and Simpson shear screws. Install a minimum of four brackets.

**END OF SECTION**

## **SECTION 07 01 50**

### **MAINTENANCE OF MEMBRANE ROOFING**

#### **PART 1 – GENERAL**

##### **1.01 SCOPE OF WORK:**

- A. Refer to the Bid Form for the specific Allowance amount for the following repairs.
- B. Provide investigation services such as camera video, utility location, cleaning and or repair of the drain line designated by the District.
- C. Contractor shall provide service on a time and material basis, which shall be approved by the District prior to execution of the work.
- D. Perform inspection of roof surface and flashings. Determine areas to be repaired.
- E. Additional repair work shall be approved and prioritized by the District.
- F. Repair work may include:
  - 1. Repair of conduits and round projections.
  - 2. Three coursing metal edges.
  - 3. Three coursing metal flanges.
  - 4. Repair of Base Flashings.
  - 5. Reinforcing drain areas.
  - 6. Topping out pitch pockets.
  - 7. Repair of blisters.
  - 8. Repair of splits.
  - 9. Remove and replace wet areas of roofing and insulation.
  - 10. Localized re-surfacing of roof membrane.
  - 11. Caulking and/or reattaching loose counterflashing.

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12. Replace lost drain strainers.

13. Seal flashing laps.

## **PART 2 - MATERIALS**

### **2.01 ROOF REPAIR PRODUCTS**

- A. All products shall be asbestos-free.
- B. All products shall be California VOC compliant.
- C. All materials used on this project shall be new products. Any materials that are seconds, out of date, or used, shall be removed from the job site.
- D. Coatings:
  - 1. Elastomeric emulsion
  - 2. White elastomeric reflective coating
- E. Mastics.
  - 1. Base Flashings: Fibrated Asphalt Mastic
  - 2. Drains: Fibrated Asphalt or Tar based Mastic
  - 3. Membrane Repairs: Fibrated Asphalt or Tar based Mastic
  - 4. Metal Edge: Fibrated Asphalt or Tar based Mastic
  - 5. Metal Flange: Fibrated Asphalt or Tar based Mastic
  - 6. Pitch Pocket: Fibrated Asphalt or Tar based Mastic
- F. Primers: Water-based Asphalt or Tar-based Primer
- G. Reinforcements.
  - 1. Emulsion: Polyester Reinforcing Fabric
  - 2. Mastics: Non Shrinking Non Rotting Woven Glass Mesh
- H. Sealants
  - 1. One Part General Purpose Sealant

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## **PART 3 – EXECUTION**

### **3.01 GENERAL PREPARATION AND APPLICATION PROCEDURES**

- A. Recommended Tools:
  - 1. Trowels
  - 2. Scissors or knife
  - 3. Rags
  - 4. Mineral Spirits
  - 5. Brooms
  - 6. Containers for trash
  - 7. Ropes for hoisting material
- B. Surface must be clean and smooth. Take care not to damage roofing felts. Broom surface and inspect. Dry wet and ponded areas.
- C. Determine type of bitumen.
- D. Use compatible mastics.
  - 1. Asphalt mastics and elastomeric mastics for Asphalt roofing components.
  - 2. Tar-based mastics and elastomeric mastics for Tar roofing components.
- E. Surfaces shall be primed with approved primer. Let primer dry prior to application of mastics and adhesives.
- F. Remove all loosely bonded or failing material during substrate preparation. Re-secure with appropriate mechanical fastener where needed.
- G. Where felts are removed, replace with equal number of felts set in specified mastic.

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### 3.02 REPAIR PROCEDURES

- A. Repair of conduits and round projections.
  - 1. Clean and prime area to be repaired.
  - 2. Install bond breaker tape over areas of expansion and contraction.
  - 3. Install elastomeric mastic over area to be sealed. Embed reinforcing membrane into wet mastic.
  - 4. Install additional layer of elastomeric mastic over membrane.
  - 5. Allow curing. Coat with white reflective coating.
- B. Metal Edge Repair (Three Course)
  - 1. Remove dirt and clean surface to a point onto the roof membrane eight inches past existing flashing. Inspect metal edge, remove loose fasteners and re-secure with longer nail or screw. Remove defective metal and replace with material of like quality and dimension.
  - 2. Prime Metal Edge and allow to dry tack free.
  - 3. Reinforce all laps of metal edge with 6 x 6 inches mesh set between application layers of asphalt mastic. Minimum application rate is 1/16 inch thick.
  - 4. Cut out any loose or protruding felts. Apply layer of asphalt mastic 4 inches past existing flashing, center 6 inches wide mesh reinforcing over metal edge and roof membrane and embed into mastic, dry trowel tight and wrinkle free.
  - 5. Cover the weave of membrane with second application of asphalt mastic.
- C. Metal Flange Repair (Three Course)
  - 6. Remove dirt and clean surface to a point onto the roof membrane 8 inches past existing flashing. Inspect metal flange, remove loose fasteners and re-secure with longer nail or screw.
  - 7. Prime metal flange and allow to dry tack free.
  - 8. Cut out any loose or protruding felts. Apply layer of asphalt mastic 4 inches past existing flashing, center 6 inches wide mesh reinforcing over metal flange and roof membrane and embed into mastic, dry trowel tight and wrinkle free.
  - 9. Cover the weave of membrane with second application of asphalt mastic.
- D. Base Flashing Repair (Three Course)
  - 1. Remove dirt and clean surface at base of flashing to a point 6 inches (150 mm) out onto the roof membrane past the termination point of the

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- existing flashing. Re-secure flashing if pulled loose with mechanical fasteners. Examine metal counterflashing, where present, re-secure where loose or pulled away from wall.
2. Cut out any blisters or water-soaked areas of flashing, replace with material of like quality and dimension set in asphalt mastic. Replace areas of missing or defective counterflashing with material of like quality and dimension. Where no counterflashing exists, reinforce termination point on vertical surface with 6 inch wide mesh reinforcing membrane between application layers of asphalt mastic. Cut any loose or protruding felts to lie flush with surrounding area.
  3. Prime entire area of repair from top of flashing out onto roof membrane and allow to dry tack free. Remove metal portion of projection and/or equipment where practical to provide complete access to base flashing.
  4. Install 3 course flashing reinforcement. Extend reinforcement mesh from top edge of flashing to 6 inches onto existing roofing. Lap ends 4 inches.
  5. Set ply and laps in asphalt mastic applied in continuous 1/16 inch thick applications. Ensure complete bond and continuity without wrinkles or voids.
- E. Drain Repair
1. Remove drain strainer and drain ring.
  2. Provide 3 course 24 x 24 inch reinforcement to drain.
  3. Prime area and allow to dry tack free.
  4. Apply a layer of asphalt mastic to primed area in a 1/8 inch thick application.
  5. Center and embed 1 ply reinforcement over drain.
  6. Apply a second layer of asphalt mastic to reinforcement.
  7. Reclamp flashing collar to drain in bed of mastic. If bolts are broken, drill and retap.
  8. Cut/remove excess membrane within drain.
- F. Filling Pitch Pockets
1. Prime area to be filled and allow to dry tack free.
  2. Fill pitch pocket and crown for drainage.
  3. Extend mastic from projection to pocket edge.
- G. Blisters:
1. Cut out delaminated felts until firmly laminated felts exist along edge of area to be repaired.
  2. Remove embedded gravel, debris, and dust from area extending at

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least 8 inches beyond perimeter of depressed area. Square corners. Assure that area is dry.

3. Prime area and allow to dry to tack.
4. Fill depression with alternating layers of asphalt mastic and asphalt ply sheet; match number of plies removed.
5. Cover layers of mastic/felt with 2 layers of reinforcing mesh [one layer of 6 inch wide strips and one layer of 12 inch wide strips embedded between trowel applications of asphalt mastic. Extend repair area at least 6 inches beyond filled depression. Overlap reinforcing mesh at least 2 inches. Cover mesh completely with mastic.
6. For graveled roofs, trowel asphalt mastic to entire area and embed clean gravel in mastic to match adjacent areas.

H. Splits:

1. Remove embedded gravel, debris, and dust from area extending at least 8 inches beyond perimeter of split. Assure that area is dry.
2. Prime area and allow to dry to tack.
3. Trowel an 1/8 inch application of asphalt mastic over splits, 6 inches wide.
4. Embed mesh into mastic and dry trowel.
5. Apply second application of asphalt mastic to mesh. Cover mesh completely.
6. For graveled roofs, apply asphalt mastic to complete area and embed clean gravel to match adjacent areas.

I. Removal and replacement of wet areas of roofing and insulation:

1. Remove wet insulation and roofing to the concrete deck.
2. Spud gravel on all sides of the repair 18 inches.
3. Prime concrete deck and tie-in area.
4. Install fiberboard insulation to match existing insulation height (estimated 1").
5. Install three plies of coated fiberglass felts set in cold process adhesive. Feather plies onto tie-in area.
6. Seal to old roof using compatible mastic and reinforcing membrane.

J. Localized Resurfacing:

1. Remove dirt and clean area to be coated.
2. Prime entire area and allow to dry tack free.
3. Apply surfacing emulsion with brush at 3.5 gallons per 100 sq.ft.
4. Embed reinforcing membrane into wet emulsion. Dry brush reinforcement. Lap edges and end laps 2 inches minimum.
5. Apply surfacing emulsion over reinforcement 2.5 gallons per 100 sq.

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ft. Apply emulsion in a uniform and continuous manner. Embed ASTM 1863 roofing aggregate into wet coating.

- K. Repair of Counterflashings:
  - 1. For repairs to these areas, replace fasteners in the same holes using longer fasteners. If replacement fasteners are needed, assure that fastener is long enough for positive attachment.
  - 2. Caulk the metal counterflashing joint with specified sealant.
- L. Seal Flashing Laps:
  - 1. Clean and prime areas to be sealed. Remove loose material.
  - 2. Install three-course repair over flashing lap using asphalt mastic and reinforcing membrane 4 inches in width.
  - 3. Allow mastic to cure. Coat with white reflective elastomeric mastic.

### **END OF SECTION**

## **SECTION 073113 COMPOSITION SHINGLE ROOFING**

### **PART 1 GENERAL**

#### **1.01 SCOPE OF WORK**

- A. This system shall be installed at all designated steep roofing areas at James Lick High School.
- B. Install eave and ridge venting in accordance with 061000 Rough Carpentry.
- C. Install specified underlayment using approved mechanical fasteners.
- D. Install composition shingle roofing system mechanically attached to the substrate.
- E. Install all details per detail drawings and manufacturer approved designs.

#### **1.02 QUALITY ASSURANCE**

- A. Contractor shall:
  - 1. Be experienced in composition shingle roofing 2 years minimum.
  - 2. Be a Manufacturer Certified or Approved contractor.

#### **1.03 SYSTEM REQUIREMENTS**

- A. Roofing system shall comply with the 2010 California Building Code.
- B. All materials shall comply with section 5.504 of the 2010 California Building Code. This requirement shall apply regardless of the products listed in these specifications. It is the responsibility of the contractor and manufacturer to comply with this requirement.
- C. FIRE RATING - UL Class A: Proposed roofing system must have approvals from Underwriters Laboratories that indicate that the existing fire ratings attain a UL Class A assembly.
- D. WIND UPLIFT: The system shall attain a Factory Mutual I-60 or UL Class 60 wind uplift rating. FM listing is not required, but an FM design standard is adequate for this project. Perimeter flashings shall meet ANSI/SPRI ES-1 – American National Standard Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- E. Roofing system shall comply with the 2010 California Building Code.
- F. All materials shall comply with section 5.504 of the 2010 California Building Code. This requirement shall apply regardless of the products listed in these specifications. It is the responsibility of the contractor and manufacturer to

comply with this requirement.

D. American Society for Testing and Materials (ASTM)

1. D 224 Standard Specification for Smooth-Surfaced Asphalt Roll Roofing (Organic Felt).
2. D 226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
3. D 3018 Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
4. D 3161 Standard Test Method for Wind-Resistance of Asphalt Shingles.
5. D 3462 Standard Specification for Asphalt Shingles from Glass Felt and Surfaced with Mineral Granules.
6. D 4869 Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing
7. D 3909 Asphalt Roll Roofing (Glass Mat) Surfaced with Mineral Granules.
8. E 108 Standard Test Methods for Fire Tests of Roof Coverings.

E. International Congress of Building Officials (ICBO)

1. ACI 127 Asphalt Shingles Made with Glass Felt
2. ICBO Evaluation Report #ER-5414

F. Underwriters Laboratories (UL)

1. 790 Test for Fire Resistance of Roof Covering Materials.
2. 997 Wind Resistance of Prepared Roof Covering Materials.

## 1.04 SUBMITTALS

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or drawings shall be approved by the engineer and owner prior to implementation.
- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the owner or engineer:
  1. Manufacturer specification data sheets. Submit for the following products:
    - a. Underlayment.
    - b. Shingles.
    - c. Mastics/adhesives

1. Manufacturer literature describing the installation procedure of the specified system.
2. Letter from manufacturer approving these specifications and drawings. Any changes in plans or specs to meet manufacturer requirements shall be submitted and highlighted. If manufacturer requirements conflict with these specifications or drawings, more stringent requirements will apply.
3. Shop drawings of any details that may be different than the NRCA standard details included in these specifications. This includes manufacturer detail drawings that may be different than NRCA drawings. All flashing detail designs shall be approved by the Owner.
4. Test reports:
  - a. Written verification from roofing material supplier that roofing system meets or exceeds regulatory agency/s requirements. A photocopy of the UL Class "A" listing for the specified system with the proposed manufacturer as listed in the 2009 UL Building Materials Directory. The Components of the system listed as UL Class "A" must match the system specified for each respective building.
  - b. Letter from the manufacturer OR listing from UL depicting the wind uplift requirements of the system.
5. Contractor information as required from section 1.02 (A) of these specifications.
6. Material safety data sheets.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

**A. Delivery of materials:**

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

**B. Do not order project materials or start work before receiving Owners written approval.**

**C. Storage of materials:**

1. Store roll goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place materials on pallets. Do not stack pallets.
2. Store materials marked "KEEP FROM FREEZING" in areas where

temperatures will remain above 40°F (5°C).

3. Rooftop storage: Disperse material to avoid concentrated loading.
4. No materials may be stored in open or in contact with ground or roof surface.
5. Should Contractor be required to quickly cover material temporarily, such as during an unanticipated rain shower, all materials shall be stored on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom.
6. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

D. Material handling:

1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

## **1.06 SITE CONDITIONS**

A. Field measurements and material quantities:

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

B. Existing conditions:

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



C. Safety requirements:

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, and local fire and safety requirements.
3. Advise Owner whenever work is expected to be hazardous to building employees, and/or operators.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
5. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, and torches are being used.

D. Environmental requirements:

1. Do not work in rain, snow, or in presence of water.
2. Do not work in temperatures below 40°F (5°C).
3. Do not install materials marked "KEEP FROM FREEZING" when daily temperatures are scheduled to fall below 40°F (5°C).
4. Remove any work exposed to freezing.
5. Advise Owners Representative when volatile materials are to be used near air ventilation intakes so that they can be shut down or blocked as University requires.

E. Security requirements:

1. Comply with job sites' security requirements.
2. Provide owner with current list of accredited persons.

**1.07 WARRANTY & GUARANTEE:**

- A. The Roofing Contractor shall furnish to the Owner a five (5) year guarantee against labor and/or material defects for all labor and materials installed under this contract. This guarantee shall also cover any and all labor and materials necessary to repair or replace any materials that are damaged or deteriorated and attributed to material and/or improper or inadequate workmanship. At a period of 60 days prior to the end of the warranty period, the Contractor shall contact the Owner to arrange for a full inspection of the roofing system, giving two weeks notice to all parties. The Contractor and Owners Representative shall inspect the entire system at a mutually agreed upon time.
- B. Contractor shall provide a lifetime limited warranty signed or printed by manufacturer agreeing to refund or replace materials and application labor, asphalt shingles that fail in materials or manufacturing workmanship within

the specified warranty period and a 10 year non-prorated Umbrella Coverage.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Specifications are based on GAF/Elk Corporation of Texas, California Division, 6200 Zerker Road, Post Office Box 472, Shafter, California 93263; 800-355-4968.

### **2.02 MATERIALS**

- A. GAF/Elk Asphalt Shingles: Timberline Cool Series or approved Equal.
- B. Ridge vents or eyebrow vents: as approved by the composition shingle manufacturer.
- C. Underlayment. Any of the following:
  - 1. ASTM D 4869, Type II, non-perforated asphalt-saturated organic felts.
  - 2. Mineral Surfaced Roll Roofing: ASTM D 3909; 90 pound mineral surfaced; granules to match adjacent shingles.
  - 3. Smooth Surfaced Roll Roofing: ASTM D 224; 50 pound smooth surfaced roll roofing.
  - 4. Elastomeric Underlayment for hips, ridges, and perimeter: Rubberized asphaltic sheet laminated to a polypropylene film meeting the requirements of ASTM D 1970, 40 mil minimum total thickness, 36 inch width, manufacturer approved by shingle manufacturer. Provide with appropriate primers as recommended by manufacturer.
- B. Fasteners:
  - 1. Nails: Galvanized 3/8 inch head, minimum 12 gage roofing nails. Minimum 3/4 inch penetration in deck. 1-1/4 inch nail recommended for new construction and 1-1/2 inch nail recommended for re-roofing. Nails should be long enough to sink into and hold in a sound nailing base.
  - 2. Fasteners shall be long enough to achieve 3/4 inch deck penetration or to penetrate through deck, whichever is less.
- C. Plastic Cement: Cutback asphaltic type with mineral fiber components, as recommended for sealing and coating flashings in buildings; free of toxic solvents; capable of setting within 24 hours at temperatures of approximately 75 degrees F and 50 percent RH.
- D. Lap Cement: Fibrated cutback asphaltic type, as recommended for use as an adhesive in the cold application of asphalt roofing or underlayment; free of toxic solvents.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify deck surfaces are dry, free of ridges, warps, or voids.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- C. Verify that roof openings are correctly framed.

### **3.02 PREPARATION**

- A. Repair or replace decking in accordance with section 061000 Rough Carpentry.

### **3.03 INSTALLATION - GENERAL**

- A. Install asphalt shingle roofing in accordance with manufacturer's instructions over dry surfaces, free of ridges, warps, and voids. Install asphalt shingle roofing in accordance with local codes if code requirements are more strict than manufacturer's requirements.
- B. Coordinate installation of roof mounted components or work projecting through roof. Verify roof openings are appropriately framed, sized, and located prior to installing work of this Section.
- C. Completed installation to provide weathertight service.

### **3.04 PROTECTIVE UNDERLAYMENT INSTALLATION**

- A. Completely cover deck with one ply of underlayment. Succeeding courses should overlap existing courses a minimum of 2 inches. Continue laying underlayment parallel to eaves. Begin by fastening a full 36 inch wide sheet along eaves. Make end laps minimum 4 inches and space end laps in succeeding courses a minimum 6 feet apart. Lap asphalt shingle underlayment 6 inches from both sides over hip and ridges, unless ridge vents are required. Secure felt with only enough nails to hold in place.
- B. Install protective underlayment perpendicular to slope of roof.
- C. Weather lap underlayment minimum 4 inches over eaves membrane.
- D. Weather lap and seal items projecting through or mounted on roof with plastic cement.

### **3.05 EAVES FLASHING (ICE DAMS)**

- A. Starting from eave edge, lay 36 inch wide strip of smooth coated roll roofing over the underlayment to produce a 1 ply membrane. Weather lap plies minimum 19 inches and nail in place. Lap ends minimum 2 inches and cement horizontal joint. Stagger end joints of each consecutive ply. Extend from the eave edge to a point at least 12 inches beyond the inside wall and cement to underlayment.

- B. Place a layer of elastomeric underlayment in accordance with manufacturer's recommendations. Extend from the eave edge to a point at least 24 inches beyond the inside wall. Begin application of shingle underlayment by overlapping the elastomeric material a minimum of 2 inches.

### **3.06 METAL DRIP EDGES**

- A. Place metal drip edge tight with fascia boards at all rake and eave edges and extend 3 inches back from roof edge bend downward over the fascia boards. Weather lap joints 2 inches. Fasten in place with nails spaced 8 to 10 inches apart.
- B. At eaves, place drip edge directly onto deck below underlayment. At rakes, place drip edge over underlayment.

### **3.07 VALLEY PROTECTION INSTALLATION**

- A. Valleys - Sheet Metal: Place 36 inch wide vertical underlayment. Place 1 layer of sheet metal flashing over the underlayment, centered over open valley and crimped to guide water. Weather lap joints 12 inches minimum and cement joints. Nail in place 18 inches on center minimum, 1 inch from edges, no nails within 6 inches of centerline.
- B. Open: Comply with ARMA recommendations. Install a second felt underlayment shingle lapped at least 12 inches and sealed with plastic asphalt cement. Install a metal valley shingle lapped at least 9 inches and sealed with plastic asphalt cement.

### **3.08 FLASHING INSTALLATION**

- A. General:
  - 1. Weather lap joints minimum 12 inches in weathertight manner. Secure in place with nails, spaced at manufacturer's recommended intervals. Conceal fastenings.
  - 2. Flash and seal work projecting through roofing with plastic cement. Provide weathertight installation.
- B. Install flashings in accordance with detail drawings and manufacturer guidelines. Details depicted in the drawings shall also conform with manufacturer guidelines. Where conflict exists, the more stringent detail shall govern. If conflict exists between depicted drawings and manufacturer guidelines, the following process shall apply:
  - 1. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor and engineer.
  - 2. Contractor shall install the flashing only after it has been approved by the engineer and Owner.
  - 3. There shall be no additional charges for this proposed detail. It is the responsibility of the contractor to ensure that all manufacturer guidelines are accounted for in the base bid for this project.

- C. ANY DETAIL NOT COVERED IN THESE SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH GOOD ROOFING PRACTICE, N.R.C.A. RECOMMENDATIONS AND HAVE THE APPROVAL OF THE MANUFACTURER PROVIDING THE WARRANTY FOR THE ROOFING SYSTEM. If a detail is not covered in these specifications the following process will take place prior to bid opening:
1. Contact manufacturer responsible for flashing guarantee. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor. OR contractor may bid using the approved manufacturer detail.
  1. Contractor shall bid using the manufacturer-approved detail.
  2. Contractor shall submit detail drawing to University as part of the submittals.
  3. No change order will be given to the contractor for flashing details that were visible prior to construction. It is the responsibility of the contractor to cover in his bid all approved and specified details.
- D. Hidden Conditions warranting a change in scope of work or change order:
1. A hidden condition is defined as a condition that is revealed when the existing roof or flashing is removed AND that condition requires additional work above and beyond the work specified. For example, damaged substrate that must be replaced.
  2. If after removal of the roof or flashing, the substrate differs from that shown on the drawings, it shall not be considered a hidden condition unless it requires a change in scope of work.
  3. If nailers are required by the manufacturer, contractor shall install nailers if not present. If nailers are present, contractor may re-use if nailers are approved by the manufacturer.

### **3.09 ASPHALT SHINGLES INSTALLATION**

- A. Place asphalt shingles in straight coursing pattern with 5 inch weather exposure to produce a double thickness over entire roof area. Do not use sealant dots for shingle alignment.
- B. Install a starter course at eaves with starter strip. Project first course of shingles minimum 1/2 inch to maximum 3/4 inch beyond face of eave fascia boards.
- C. Extend shingles minimum 1/2 to 3/4 inch beyond face of rake edge fascia boards.
- D. Nail shingles in place through double thickness area designated by fastener line, or between and in line with sealant dots if no fastener line, and in accordance with manufacturer's instructions for slope and anticipated wind conditions.

- E. Cap hips and ridges with ridge shingles, maintaining 6-2/3 inch weather exposure. Place to avoid exposed nails.

### **3.10 RIDGE AND EVE VENTING**

- A. Verify and install eve venting as specified in section 061000 Rough Carpentry.
- B. Verify and install ridge vent opening as specified in section 061000 Rough Carpentry.
- C. Install manufacturer approved ridge vents at all ventilated ridges. Depending upon the manufacturer used, these detailed instructions may vary. Contractor shall follow manufacturer guidelines for the installation of all venting.

#### **D. APPLICATION GUIDELINES**

1. Ventilate hips with approved hip ventilation system.
2. Orient the Ridge pieces with the high end (leading edge) away from the prevailing winds.
3. The starter should be 3 plies that are 3 1/2" long and folded across the ridge, flush with the rake edge of the shingles. Fold one piece of shingle fabric (supplied in box) into thirds and attach the starter with 2 fasteners on each side. Fasteners should be long enough to obtain 3/4" deck penetration or penetration through the decking, whichever is less.
4. Place the first Ridge piece directly over the starter with the overlap pushed snugly against the starter. Ensure the piece is aligned properly to the roof ridge, and then nail it into place. Fasten each piece with 2 fasteners. Nail through the nail dot. This will penetrate the reinforced nail zone of the plastic backer. If additional nailing is desired, add 2 nails 1" further from the exposure than the nail dots, for a total of 4 fasteners per piece. In addition to these nails, the leading edge of the first piece may be face nailed, if desired. If face nails are added, ensure that both nails penetrate through the plastic backer.
5. Vented Ridge is self-aligning and the pieces have tabs on the rear end and underneath, which allow them to interlock.
6. Each piece should be placed snugly on top of the preceding piece, then slid forward until the tabs on the underside engage with the tabs on the rear of the preceding one. This will produce a 9 1/4" exposure.
7. Check the interlocking feature by gently trying to lift the front of the 2nd piece.
8. Continue to apply vented Ridge with a 9 1/4" exposure. Cover the last Ridge piece with two layers of shingle fabric or a trimmed piece of Ridge.

## **E. GENERAL INFORMATION**

1. **FASTENERS:** Use corrosive resistant nails long enough to obtain 3/4" penetration or penetrate through the decking (nails with 3/8" head required, recommended lengths are 1 3/4" for a new roof and 2 1/2" for a roof-over). Make sure the nails penetrate the reinforced nail zone (crosshatched area on back of backer piece).
2. **SPECIAL NOTE:** Vented RidgeCrest should always be installed with soffit/eave/intake vents of equal or greater "Net Free Ventilation Area". The airflow passage between the air intake and the ridge must not be blocked or restricted. Do not ventilate roof hips. Do not install vented Ridge on roofs with less than a 4/12 pitch or more than a 12/12 pitch. Contractor is responsible for insuring proper ventilation requirements are met. This includes ridge slot, net free area of ridge vent, soffit vents, and any other methods of ventilating the space. Vented Ridges should only be used with soffit ventilation. Refer to Uniform Building Code section 1505.3. Vented Ridges are not designed to be walked on. Excessive force from pressure on the top of the piece will damage the fabric. Do not step on, drag safety lines on, place hands on ridge while crossing ridge, or otherwise apply pressure to the top of the installed piece.

## **3.11 ADJUSTING AND CLEANING**

### **A. Repair of deficiencies:**

1. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.
2. If more than two final inspections are required, contractor shall reimburse Owner for engineer's time.

### **B. Clean-up:**

1. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.
2. Clean gutters and downspouts of debris.
3. Remove debris as needed during each work day. All debris must be removed from the job site daily.
4. No debris shall accumulate on the roof surface or building grounds.
5. Any damage to the building or landscaping shall be repaired to its prior condition at no additional cost to the Owner.
6. The Contractor shall be able to produce written documentation that all debris was dumped properly.

7. Any dirt, stains from bitumen materials, or other foreign matter shall be removed from the newly installed membrane to restore the surface to a clean, spot-free, and as-new condition, using methods as recommended by the manufacturer.

**END OF SECTION**



## **SECTION 07 54 00 THERMOPLASTIC MEMBRANE ROOFING**

### **PART 1 – GENERAL**

#### **1.01 SCOPE OF WORK UNDER THIS SECTION:**

- A. Provide deck leveling as specified in this section.
- B. Provide odor control measures at all air intakes as specified.
- C. Increase the width and slope of existing drainage crickets as specified.
- D. Install crickets on the high sides of all curbs and along the drainage edge between primary drains as specified.
- E. Mechanically attach or adhere specified insulation and coverboard to the deck as specified.
- F. Mechanically attach or adhere specified tapered insulation and coverboard to the deck as specified.
- G. Mechanically attach or adhere specified thermoplastic membrane as specified.
- H. Adhere specified thermoplastic membrane up and over all adjacent parapet walls as specified.
- I. Install walk pads from roof access points to all serviceable equipment as specified.
- J. Any equipment that will not have curb heights of 8" above the final roof surface shall be extended or raised. If the proposed roofing system manufacturer will accept curb heights less than 8", contractor shall submit request in writing (from manufacturer) to owner and engineer to withdraw this requirement. If a particular piece of equipment is impossible or not financially feasible to lift, raise or extend, contractor shall notify the engineer prior to the bid date for direction.
- K. Perimeter and projection flashings:
  - 1. Provide all flashing and penetration details in accordance with the detail drawings and manufacturer guidelines as specified in this.
  - 2. Drawings included with these specifications are not meant to accurately depict substrate conditions. They are meant to provide NRCA guidelines for basic flashing installation according to the system specified.
  - 3. If a manufacturer standard and required detail differs from that shown on the project detail drawings included in these specifications, contractor shall submit manufacturer approved drawing to the Owner and Engineer for approval. If the manufacturer requirements for a flashing detail is less stringent than those shown in the project drawings, the more stringent flashing detail shall govern with the approval of the manufacturer providing the warranty for this project.
  - 4. All perimeter and projection flashings shall be replaced with new as specified.

- L. Provide owner with a five (5) year contractor guarantee as specified.
- M. Provide owner with a twenty (20) year no-dollar-limit manufacturer warranty covering labor, materials, and metal flashings as specified.

## **1.02 QUALITY ASSURANCE**

- A. Contractor shall:
  - 1. Be experienced in single ply roofing.
  - 2. Be certified or approved for the installation of proposed manufacturer's warranted roofing systems.

## **1.03 SYSTEM REQUIREMENTS**

- A. Roofing system shall comply with the 2010 California Building Code.
- B. All materials shall comply with section 5.504 of the 2010 California Building Code. This requirement shall apply regardless of the products listed in these specifications. It is the responsibility of the contractor and manufacturer to comply with this requirement.
- C. FIRE RATING - UL Class A: Proposed roofing system must have approvals from Underwriters Laboratories that indicate that the existing fire ratings attain a UL Class A assembly.
- D. WIND UPLIFT: Any of the following.
  - 1. Factory Mutual I-60. FM listing is not required, but an FM design standard for wind uplift is acceptable for this project.
  - 2. UL Class 60 wind uplift rating.
  - 3. ASCE 7-05 Wind Design loads as calculated by the manufacturer for this specific project.
- E. Perimeter flashings shall meet ANSI/SPRI ES-1 – American National Standard Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- F. The new roof system shall comply with all mandatory requirements under The California Green Building Standards as listed under Title 24 Part 11.

## **1.04 TECHNICAL SUBMITTALS**

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or

drawings shall be approved by the engineer and owner prior to implementation.

- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the owner or engineer:
  - 1. Manufacturer specification data sheets. Submit for the following products:
    - a. Roof assembly.
    - b. Single ply membrane.
    - c. Adhesives.
    - d. Walk pads (must be approved by owner).
    - e. Any other product used on this project.
  - 2. Manufacturer literature describing the installation procedure of the specified system.
  - 3. Letter from manufacturer approving these specifications and drawings. Any changes in plans or specs to meet manufacturer requirements shall be submitted and highlighted. If manufacturer requirements conflict with these specifications or drawings, more stringent requirements will apply.
  - 4. Shop drawings of any details that may be different than the NRCA standard details included in these specifications. This includes manufacturer detail drawings that may be different than NRCA drawings. All flashing detail designs shall be approved by the Owner.
  - 5. Material safety data sheets.
  - 6. Test reports:
    - a. Perimeter flashings shall meet ANSI/SPRI ES-1 – American National Standard Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems. Provide documentation from the manufacturer along with detail drawings for this requirement.
    - b. Written verification from roofing material supplier that roofing system meets or exceeds regulatory agency/s requirements. A photocopy of the UL Class "A" listing for the specified system with the proposed manufacturer as listed in the most recent UL Building Materials Directory. The Components of the system listed as UL Class "A" must match the system specified for each respective building.
    - c. Wind uplift rating. Submit any of the following:
      - Factory Mutual I-60. FM listing is not required, but an FM design standard for wind uplift is acceptable for this project. Submit calculations for wind ratings for FM 1-60 for the specific building AND a letter or documentation from the manufacturer that roof attachment

meets or exceeds these requirements.

- UL Class 60 wind uplift rating. Submit a letter or documentation from the manufacturer that roof attachment meets or exceeds this requirements.
- ASCE 7-05 Wind Design loads as calculated by the manufacturer for this specific project. Submit calculations for wind ratings using ASCE 7-05 for the specific building AND a letter or documentation from the manufacturer that roof attachment meets or exceeds these requirements.

## **1.05 WARRANTY & GUARANTEE**

- A. Warranty: The Roofing Manufacturer shall provide a full system no dollar limit (NDL) warranty covering the roof membrane, flashings, insulation, fasteners and stress plates, termination bar, metal, etc., against labor and/or material deficiencies for a minimum period of twenty (20) years from the date of acceptance by the Owner. This written warranty will be provided by the membrane manufacturer and will cover material and workmanship for a minimum of twenty (20) years without any cost to the Owner. The warranty shall specifically state that temporary emergency repairs made to the roofing system by the Owner shall not void or in any way affect the provisions of the warranty. This warranty shall include all components provided by the roof membrane manufacturer including but not limited to coated metal or metal components.
- B. Guarantee: Upon project completion and owner acceptance, effective upon complete payment, Contractor shall issue owner a guarantee against defective workmanship and materials for a period of five (5) years.

## **PART 2 – MATERIALS**

### **2.01 GENERAL:**

- A. All materials used on this project shall be new products.
- B. Any materials that are seconds, out of date, or used, shall be removed from the job site.
- C. Single ply membrane shall be white with a Cool Roof and Energy Star rating.
- D. FIRE RATING: UL Class A: Proposed roofing system must have approvals from Underwriters Laboratories that indicate that the existing fire ratings attain a UL Class A assembly.
- E. WIND UPLIFT: The system shall attain a Factory Mutual I-60 or UL Class 60 wind uplift rating. FM listing is not required, but an FM design standard is

adequate for this project.

## **2.02 RELATED MATERIALS:**

- A. TAPERED INSULATION for main roof slope to drain or cricket enhancement: Isocyanurate as approved by membrane manufacturer.
- B. FLAT STOCK INSULATION: Isocyanurate 1" thickness as approved by membrane manufacturer.
- C. COVERBOARD:
  - 1. USG Securerock,
  - 2. Densdeck Prime 1/4"
  - 3. or approved equal.
  - 4. Note: Wood fiber or perlite coverboard is not acceptable for this project even if it is approved by the manufacturer.
- D. COATED METAL FLASHINGS: All coated metal flashing shall be supplied by the manufacturer and covered under the warranty.
- E. ADHESIVES: Shall be approved by the membrane manufacturer. Adhesives shall be voc compliant.
- F. WALK PADS: Shall be furnished by the membrane manufacturer. Walk treads shall be of the highest quality provided by the manufacturer. Samples of the walk treads shall be provided to the owner for approval.
- G. FASTENERS AND STRESS PLATES: Shall be a non-corrosive type approved by the membrane manufacturer.
- H. CAULK: Shall be a high-grade silicone or urethane as recommended by a membrane manufacturer.
- I. POND PATCH: Shall be approved by the manufacturer providing the membrane for this project.

## **2.03 PRE-APPROVED ROOFING SYSTEMS/MANUFACTURERS:**

Note: When systems are fully adhered, use fleece backed membrane only.

- A. PVC Thermoplastic Membrane
  - 1. Sarnafil, 72 mils PVC
  - 2. IB 80 mils PVC
  - 3. Manville 80 mils PVC
  - 4. Durolast 80 mils PVC

5. Carlisle 80 mils PVC
6. GAF 80 mils PVC

B. TPO Thermoplastic Membrane

1. Firestone 80 mils TPO
2. Manville 80 mils TPO
3. Carlisle 80 mils TPO
4. GAF 80 mils TPO

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. It is the responsibility of the contractor to ensure that all requirements for the specified 20 year NDL warranty are accomplished and included in the bid for this project. No change orders will be approved for non-specified details, techniques, materials or procedures in order to obtain this warranty. If major problems or challenges are noted with regards to these requirements, the contractor shall notify the owner prior to the bid opening.
- B. Difficult areas of roofing:
  - 1. It is not the intention of this specification to provide means or methods of roof installation. However, means and methods of roof installation must adhere to industry and manufacturer standards and shall have the approval of the owner and engineer.
  - 2. Unusual, unorthodox, or dangerous methods of roof removal or installation shall be reported to and approved by the owner prior to execution.
  - 3. If rooftop equipment or any other building component needs to be modified or moved in order to properly install the roofing system, it will be the responsibility of the contractor to perform the work under the base bid for this project without change order request. Contractor shall obtain permission from the owner prior to bid opening for any equipment or building component modification. Any damage that is incurred to the equipment or building component as a result of movement or modification shall be repaired or replaced by the contractor at no cost to the owner.
- C. Perimeter and projection flashings: Please refer to section 3.06 of these specifications for specific instructions regarding flashings.

### **3.02 SURFACE PREPARATION:**

- A. Remove designated roof membrane and flashings down to the deck as specified in section 02 41 19.13.
- B. Repair or replace damaged wood decking and wood deck components in accordance with section 06 01 00 Rough Carpentry.
- C. Repair or replace damaged or wet lightweight concrete. Repairs shall be approved by the new system manufacturer in order to maintain the required twenty (20) year no-dollar-limit warranty.
- D. Wood or concrete deck deflection:
  - 1. Check decking for deflection using a string-line.

2. Modify decking in order to eliminate deflected areas that may cause ponding. Decking can be leveled using a manufacturer approved filler such as Pond Patch or by using insulation board.
  3. If decking is significantly deflected, notify owner and engineer immediately because this could be an indication of roof deck damage.
- E. Ensure that the substrate is dry and free of dirt, debris, and other foreign matter prior to the installation of new materials.

### **3.03 ODOR CONTROL**

1. Contractor shall take the following steps to ensure that odor does not penetrate into work space during installation of roofing system:
  1. Provide charcoal filters over air intakes.
  2. Provide duct extensions or diverters when working near air intakes. Intake diverters may be flex hosing or plywood structures.
  3. Work with the building occupants to coordinate work around air intake units. In some cases it may be possible to re-circulate or shut air intake system down.
2. The contractor is ultimately responsible for odor control as part of the contract. The owner and roof consultant shall determine if contractor has provided adequate odor control measures.

### **3.04 INSTALLATION OF NAILERS:**

- A. Install nailers as required by the manufacturer in accordance with section 06 10 00 Rough Carpentry.

### **3.05 INSTALLATION OF CRICKETS, INSULATION AND COVERBOARD:**

- A. Crickets: Increase the width of all drainage crickets to meet the following specifications. Half diamond crickets (at walls and behind curbs) shall have a width that equals  $1/6^{\text{th}}$  of the length. Full diamond crickets shall have a width of  $1/3^{\text{rd}}$  of the length.
- B. Install drainage crickets at the high side of all curbs.
- C. Install drainage crickets along the perimeter between primary drains.
- D. Mechanically attach or adhere the specified insulation and coverboard filling all voids greater than 1/4" and staggering all joints. If using fasteners, fasten only into upper flutes. (For applications on metal decks). Fastener length should not penetrate down below the lower flutes because conduits are mounted on the underside of the deck.



- E. Sump the insulation at drains 36 inches square from the edge of the drain to provide a positive slope. Drain sump shall have tapered insulation to provide a uniform slope down to the drain.
- F. Stagger all joints between layers.
- G. Cut insulation to fit snugly around all penetrations. Fill any voids greater than ¼" like material.
- H. SPECIAL NOTE: At this time the contractor shall put a string line on the completed insulation in order to determine if there are any low areas that will cause ponding water. Variations greater than ½" shall be treated with filler material (pond patch) or additional insulation. Be careful to check drainage valleys at all crickets. These are areas most susceptible to ponding water.

### **3.06 INSTALLATION OF MEMBRANE:**

- A. Install perimeter sheets using approved adhesive in accordance with manufacturer's requirements.
- B. Follow manufacturer recommendations for the installation of perimeter or membrane venting.
- C. Inspect the membrane for factory defects or shipping damage. Defective and/or damaged membrane will be rejected. (Note: No more than ten (10) patches per sheet.)
- D. Position field sheets so that side laps are single lapped with the slope and in accordance with the manufacturer's recommendation.
- E. Fully adhered membrane: Adhere the membrane using approved adhesive in accordance with the manufacturer's requirements to satisfy specified wind uplift requirements.
- F. Mechanically attached membrane: Mechanically attach membrane using approved fasteners in order to obtain specified wind ratings.
- G. Prevent wrinkling of membrane as much as possible. (If excessive wrinkling occurs, the Consultant may require the contractor to tack-weld the lap seams and then complete the entire weld.)
- H. Set the seam welder to the manufacturer's required setting. Make a test run and check the seam for proper welds. (All test runs shall be performed on a daily basis.
- I. Probe seams daily and repair loose edges, fish-mouths, and other defects the same day.
- J. Insure that all welding is performed by qualified personnel.
- K. The seam welder shall be powered by a dedicated power supply so as to ensure

proper, adequate, and uniform voltage for sufficient seaming procedures. Also, the welder shall be equipped with voltage regulator cut-off features such as infrared sensors and other similar devices to insure consistent voltage, thereby reducing the possibility of cold or inadequate welds. The extension cord to welding units from power supply shall not exceed one (1) cord of 100 feet in length.

### **3.07 FLASHINGS**

#### **A. General flashing requirements:**

##### **1. Elastomeric Flashing:**

- a. Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with Flashing Adhesive. Embed flashing into adhesive immediately.
- b. Ensure complete bond and continuity without wrinkles or voids.
- c. Any equipment that will not have curb heights of 8" above the final roof surface shall be extended or raised. If the proposed roofing system manufacturer will accept curb heights less than 8", contractor shall submit request in writing (from manufacturer) to owner and engineer to withdraw this requirement. If a particular piece of equipment is impossible or not financially feasible to lift, raise or extend, contractor shall notify the engineer prior to the bid date for direction.

#### **B. Install flashings in accordance with detail drawings and manufacturer guidelines. Details depicted in the drawings shall also conform with manufacturer guidelines. Where conflict exists, the more stringent detail shall govern. If conflict exists between depicted drawings and manufacturer guidelines, the following process shall apply:**

1. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor and engineer.
2. Contractor shall install the flashing only after it has been approved by the engineer and Owner.
3. There shall be no additional charges for this proposed detail. It is the responsibility of the contractor to ensure that all manufacturer guidelines are accounted for in the base bid for this project.

#### **C. ANY DETAIL NOT COVERED IN THESE SPECIFICATIONS SHALL BE INSTALLED IN ACCORDANCE WITH GOOD ROOFING PRACTICE, N.R.C.A. RECOMMENDATIONS AND HAVE THE APPROVAL OF THE MANUFACTURER PROVIDING THE WARRANTY FOR THE ROOFING SYSTEM. If a detail is not covered in these specifications the following process**

will take place prior to bid opening:

1. Contact manufacturer responsible for flashing guarantee. Manufacturer shall inspect the detail and provide a recommended flashing design to the contractor. OR contractor may bid using the approved manufacturer detail.
2. Contractor shall bid using the manufacturer-approved detail.
3. Contractor shall submit detail drawing to Owner as part of the submittals.
4. No change order will be given to the contractor for flashing details that were visible prior to construction. It is the responsibility of the contractor to cover in his bid all approved and specified details.

D. Hidden Conditions warranting a change in scope of work or change order:

1. A hidden condition is defined as a condition that is revealed when the existing roof or flashing is removed AND that condition requires additional work above and beyond the work specified. For example, damaged substrate that must be replaced.
2. If after removal of the roof or flashing, the substrate differs from that shown on the drawings, it shall not be considered a hidden condition unless it requires a change in scope of work.
3. If nailers are required by the manufacturer, contractor shall install nailers if not present. If nailers are present, contractor may re-use if nailers are approved by the manufacturer.

### **3.08 SPECIAL INSTRUCTIONS:**

- A. Obsolete Penetrations - Verify with owner all obsolete penetrations and remove from the roof.
- B. Delicate mechanical equipment – All mechanical equipment that is damaged or too delicate to move shall be identified at the pre-bid meeting or prior to bid.
- C. Sleepers - All sleepers should run perpendicular with the flow of water. If this is not possible, the sleepers should be boxed in and a diverter placed on the upside to prevent water from ponding. For extremely large sleepers that cannot be boxed in, contractor shall install tapered insulation between the sleepers in order to evacuate water from underneath the unit.
- D. Existing Horizontal Conduits that do not need to be mechanically attached to the roof surface and are less than 1.5" diameter – Install Copper B Line supports or approved equal. Adhere supports to the roof surface using approved sealant or adhesive in order to prevent movement of the lines. Refer to drawing entitled "Copper B Line Support."
- E. Existing Horizontal Pipes that do not need to be mechanically attached to the

roof surface for seismic support – Install pipe hanger system in accordance with manufacturer requirements. Carefully support existing lines in order to prevent breakage during installation.

- F. Condensate lines – Install Copper B Line supports or approved equal. Adhere supports to the roof surface using approved sealant or adhesive in order to prevent movement of the lines. All condensate lines shall be set in a manner to facilitate drainage. Contractor shall replace or repair damaged or missing condensate lines or lines damaged during roof installation. Contractor shall run condensate lines to nearest drain outlets. Refer to drawing entitled “Copper B Line Support.”
- G. Gas lines and electrical lines that need to be attached to the roof surface: Install blocking and attach to the roof deck. Install membrane flashing over blocking. Install another blocking on top of the covered blocking. Install sheet metal pan covering. Attach line to curb with U bracket. U bracket shall be attached to the metal pan and underlying blocking. Do not penetrate the membrane covered blocking. Refer to detail drawing entitled “protected wood sleeper” attached to these specifications.
- H. Equipment Legs and Supports - All supports for equipment and like items shall be set on wood blocks with membrane protection pads underneath or rubber pads.
- I. Prime and paint all exposed sheet metal flashings in accordance with Section 09 91 13.
- J. Existing Galvanized Jacks: All sheet metal roof jacks that house conduits will be removed will incorporate manufacturer approved boot sleeves.
- K. Remove Josam type drains and install manufacturer approved drain inserts in accordance with the detail drawings.
- L. MECHANICAL EQUIPMENT NOT MEETING 8” HEIGHT REQUIREMENT FOR BASE FLASHING: It is not the intention of this contract to perform major mechanical alteration in order to provide 8” heights on flashings. If a mechanical unit exists that does not meet a flashing height requirement, the contractor may install flashings in a manner that does not require major alteration. It is still the responsibility of the contractor to perform the flashing in a watertight manner, and the flashing will be included in the contractor guarantee. If the manufacturer requires a particular flashing height, it is acceptable for the manufacturer to exempt the mechanical unit from the warranty with approval of the owner and engineer. If a manufacturer is not willing to exempt a specific flashing, then it is the responsibility of the contractor to either comply with the manufacturer requirement, or use another manufacturer.

### **3.09 WALK TREADS:**

- A. Clean roof surface of all dirt and debris where walk treads are to be placed.
- B. Install walk treads as approved and warranted by the membrane manufacturer.
- C. Walk treads shall be heat-welded to the membrane by a method approved by the manufacturer. If approved, the preferred method of walkpad attachment is by tack-welding corners.
- D. Locations of walk treads: Completely around all serviceable equipment. From serviceable equipment to roof access point. If there is no designated roof access point, install walkways between units only. Also follow designated layouts on roof plan drawings.
- E. Cut slots or spaces in walkpads that may impede drainage. Avoid welding walkpads over membrane seams if possible.
- F. Contractor shall be responsible to estimate linear footage of required walkpads in accordance with the above specification.

### **3.10 POWER SOURCE:**

- A. The Contractor shall be responsible for supplying his own power source.
- B. The power shall be of sufficient voltage to insure that welds are made properly.

### **3.11 AESTHETICS:**

- A. Contractor shall coordinate aesthetics with Owner.
- B. Contractor shall take precaution against overspray as directed by Owner.
- C. Contractor shall paint areas of asphalt spillage as directed by the Owner.
- D. Paint all sheet metal and lead surfaces in accordance with Section 099113.
- E. Any dirt, stains from bitumen materials, or other foreign matter shall be removed from the newly installed membrane to restore the surface to a clean, spot-free, and as-new condition, using methods as recommended by the manufacturer.

### **3.12 FINAL TESTING, INSPECTION & PUNCHLIST:**

- A. Contractor shall notify the owner when roof is ready for final inspection.
- B. Owner shall coordinate final inspection and provide contractor with punch list.
- C. Contractor shall perform punchlist items within seven (7) working days of having received the final inspection punchlist.
- D. Owner shall coordinate an inspection verifying that all punchlist items have been

complete. If punchlist items remain, contractor may be subject to compensating the owner for additional final punchlist verification inspections.

E. Drain testing.

1. Contractor shall flood test each drain to ensure that drain inserts are properly installed.
2. Install balloon plug within the drain plumbing at a location lower than the drain insert.
3. Fill the drain and drain sump with water. Allow to stand for 24 hours. Check for leakage by observing inside of the building. The owner may use a capacitance scanner to ensure that water has not penetrated under the membrane.

F. Final inspection of drainage:

1. Contractor shall flood test the roof in order to verify successful drainage. Flood testing shall occur with owner observation.
2. After 48 hours, the roof will be inspected by the owner. Water remaining on the roof shall be categorized as ponding water in accordance with California Building Code 2010. At this time, the contractor shall be responsible for correcting ponding on the roof through the installation of pond patch filler and new membrane. The procedure shall be approved by the manufacturer. Even though the manufacturer approves standing (ponding) water, this does not alleviate the contractor from the responsibility of correcting ponding water on this project.

**END OF SECTION**

## **SECTION 09 91 13**

### **EXTERIOR PAINTING**

#### **PART 1 - GENERAL**

##### **1.01 SCOPE OF WORK:**

- A. Provide all labor and materials required to complete all painting and finishing work required by this Specification.
- B. Work shall include:
  - 1. Painting of all new and existing sheet metal flashings and other metal elements which are part of the roof assembly. Pre-finished Kynar coated sheet metal with color approved by the District does not have to be painted.
  - 2. Painting of all wood elements that are adjacent to the roof assembly including but not limited to walls and fascia.
  - 3. Painting of the designated high parapet walls of building 1200.
  - 4. Painting of any metal or wood component that is stained or contaminated by work performed under this contract.

##### **1.02 QUALITY ASSURANCE:**

- A. Comply with all state and local regulations governing the use of paint materials. All paint primers and finishes will comply with California Air Resource Board and Environmental Protection Agency regulations.

##### **1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING:**

- A. Deliver materials to the work site in unopened containers bearing manufacturer's name and product description.
- B. Store materials in a dry, clean, well ventilated area. Close containers.

##### **1.04 TECHNICAL SUBMITTALS**

- A. Submittal requirements: Contractor shall highlight anything in the submittal package that conflicts with or changes specifications or drawings. Include a reason for the change. Any submittals that alter existing specifications or drawings shall be approved by the engineer and District prior to implementation.

- B. The following submittals are to be made in conjunction with any other submittal requirements set forth in the bid documents.
- C. The contractor shall submit the following upon request of the District or engineer:
  - 1. Manufacturer specification data sheets. Submit for the following products:
    - a. Paint.
    - b. Primer.
  - 2. Manufacturer literature describing the installation procedure of the specified system.

## **PART 2 - PRODUCTS**

### **2.01 PAINT MATERIALS:**

- A. Sinclair Paint Company (ICI Paint Stores)
- B. Dunn-Edwards Paint Corporation
- C. Sherwin-Williams Co.

### **2.02 EXTERIOR PAINT SYSTEMS:**

- A. Zinc Coated Metal & Lead Flashings:
  - 1. Pretreatment - (ICI Sinclair Vinyl Wash Primer, Dunn-Edwards Galva-Etch GE 123, Sherwin Williams B50W3).
  - 2. 1st coat - Primer Coat. (ICI Devoe Devguard #4120, Dunn-Edwards W 711, Sherwin Williams B42N8).
  - 3. 2nd coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
  - 4. 3rd coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
- B. Wood:
  - 1. 1st Coat - Exterior Wood Primer (ICI Sinclair Ultra-Hide Durus #2110, Dunn- Edwards W 42-1, Sherwin Williams Y24W20).
  - 2. 2nd Coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair #2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin Williams A84)
  - 3. 3rd Coat - Water base acrylic, semi-gloss enamel finish coat (ICI Sinclair



#2406 Decrashield Semigloss Finish, Dunn-Edwards W901, Sherwin  
Williams A84)

### **PART 3 - EXECUTION:**

#### **3.01 CONDITION OF SURFACES:**

Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence and quality of work. Do not apply paint or finish until conditions are satisfactory.

#### **3.02 PREPARATION:**

- A. Prepare surfaces in a skillful manner to produce finish work of first class appearance and durability.
- B. Clean surfaces free of dust, dirt, oil, grease and other foreign matter prior to the application of the prime coat.
- C. Repair all voids, nicks, cracks, dents, etc., with suitable patching material and finish flush to adjacent surface.

#### **3.03 APPLICATION:**

- A. Apply material evenly, free from sags, runs, crawls, holidays or defects.
- B. Apply paint by brush, roller or spray.
- C. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- D. Allow each coat to dry before succeeding coat application.

#### **3.04 REINSTALLATION OF REMOVED ITEMS:**

Following completion of painting each space, promptly reinstall all items removed for painting, using only workmen skilled in the particular trade.

#### **3.05 CLEANING:**

Remove all surplus materials and debris from the work site at completion of each days work. Remove all splatterings from all finish surfaces.

**END OF SECTION**