South King Fire and Rescue
Station 66 Facility Improvements

ADDENDUM #1
July 5, 2017

TO ALL BIDDERS:

The Bid Documents issued **April 13, 2017** for the project noted above are amended by this Addendum.

Receipt of this addendum shall be acknowledged by inserting its number in the space provided on the bid form.

PROJECT MANUAL ITEMS

ITEM 1. ADD the following sections:

a. 011110 Summary of Hazardous Materials Work (34 pages)
b. 028200 Asbestos Remediation (15 pages)
c. 028300 Lead-Containing Paint and Materials Disturbance (11 pages)
d. 028500 PCB and Hg Remediation (7 pages)

PLUMBING/MECHANICAL

PROJECT MANUAL ITEMS

22 13 00 **Add**

2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. ABS Pipe: Schedule 40, ABS material, DWV, Cellular Core, bell and spigot style solvent sealed ends. NSF Standard 14, ASTM F628, ASTM D3965.
1. Fittings: ABS, DWV, ASTM D2661.
2. Joints: Solvent weld. ASTM D2235.

22 13 00 **Delete**

2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe & Fittings: ASTM A888, CISPI 301, hub-less. Made in USA by AB&I, Charlotte or Tyler marked with collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.
1. Fittings: Long pattern cast iron.
2. Joints: Neoprene gasket ASTM C-564, all type 304 stainless steel clamp and shield assemblies, 80 in/lbs worm drive. FM-1680, Class 1, CISPI 310 and certified by NSF international. Minimum 4 clamps up to 4", 6 clamps for 5" and larger. Husky SD 4000, Mission Heavy Weight, Clamp-All or approved equal.

ATTACHMENTS

1. Pre-Bid Walkthrough Sign-In Sheet (1 page).
2. Hazardous Materials Specifications Sections:
    a. 011110 Summary of Hazardous Materials Work (34 pages)
    b. 028200 Asbestos Remediation (15 pages)
    c. 028300 Lead-Containing Paint and Materials Disturbance (11 pages)
    d. 028500 PCB and Hg Remediation (7 pages).

END OF ADDENDUM #1

RICE FERGUS MILLER 30 YEARS

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SIGN-IN

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SECTION 011110 - SUMMARY OF HAZARDOUS MATERIALS WORK

PART 1 - GENERAL

1.1 DEFINITIONS

A Hazardous Materials Consultant:

1. EHS – International, Inc.
   1011 SW Klickitat Way, Suite 104
   Seattle, WA 98134
   Phone: (206) 381-1128
   Fax: (206) 254-4279
   Contact: Derica Escamilla

1.2 WORK COVERED BY CONTRACT DOCUMENTS-HAZARDOUS MATERIALS

A The Work shall include the providing of all supplies, tools, equipment, transportation, utilities, services, superintendence, labor, and the furnishing of all materials, items and accessories needed for the impact of Asbestos-Containing Materials (ACM), Lead Containing Paint (LCP), Lead Containing Material (LCM), Mercury-Containing Light Tubes, and Polychlorinated Biphenyls (PCBs), in strict conformance with the Contract Documents and all applicable regulations.

B Drawings and general provisions of the Contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.3 ASBESTOS-CONTAINING MATERIALS (ACMs)

A Presence of Asbestos: Fire Station #66 has been surveyed with the objective of identifying the presence of ACMs. ACMs present are included in the Abatement sub-contractor’s work under contract to the Contractor as indicated in the Limited Hazardous Materials Survey Report Summary (attached to this Section) and the Hazardous Materials Removal Design Drawings and as specified in Section 028200. Note: Not all ACM present will be removed within the scope of work, refer to the Hazardous Materials Removal Drawings.

B A certified asbestos sub-contractor, working directly for the Contractor, will remove all ACMs expected to be impacted by the Work prior to commencement of that portion of the Work. If identified ACMs or suspect materials not identified by the survey report as having been sampled will be impacted by the Work during the project, stop prior to impacting the identified/suspect materials and contact the Owner and the hazardous materials consultant, prior to proceeding with work. The contractor will have an asbestos abatement contractor available on an on-call basis to remove any new identified/suspect materials. All asbestos-containing materials removed shall be prepared for disposal and disposed of per WISHA and EPA regulations. No claim for delay of work or additional scope will be allowed for incidental non-friable asbestos removal by the Contractor.

C Damage of Asbestos by the Contractor: Damage to asbestos-containing materials not within the scope of work, caused by the Contractor, shall be removed/repaired at the Owner's choice to the satisfaction of the Owner by the Contractor using certified asbestos workers, at the expense of the Contractor.

D Asbestos-related work

1. Any asbestos related work must be accomplished by a certified asbestos contractor.

E Work Occurring near ACMs

1. All personnel performing work in such locations shall be trained and certified to have completed Class IV asbestos training ({e.g., working in close proximity to ACM, but not disturbing it} - two-hour awareness training) as dictated by Washington Department of Labor and Industries Division of Occupational Safety and Health (L&I DOSH) regulations and according to these specifications.

F Materials with <1% asbestos impacted by other trades

1. All personnel performing work in such locations shall be trained and certified to have completed Class IV asbestos training ({e.g., working in close proximity to ACM, but not disturbing it} – two- hour awareness training) as dictated by Washington Department of Labor and Industries Division of Occupational Safety and Health (DOSH) regulations and according to these specifications.

G The Contractor shall ensure that copies of the Limited Hazardous Materials Survey Report are made available to, and are retained on the Project site by all Subcontractors.

H Off-Limit Areas: Non-asbestos certified personnel shall not enter any building areas/crawl spaces marked by "Danger Asbestos Hazard" signs or outside of the cleaned area without appropriate training.

1.4 LEAD RELATED ACTIVITIES

A The Owner's hazardous materials consultant has conducted limited lead x-ray fluorescence analyzer (XRF) and bulk paint sampling investigations of the areas of impact at Fire Station #66. Detectable levels of lead in painted/glazed surfaces were identified at the property within the proposed work areas.

B The work requires the disturbance and disposal of lead containing materials from Fire Station #66 as specified herein. The lead work shall be performed in accordance with all current applicable lead regulations and these specifications. These work activities are identified as specified in Section 028300 and in the Hazardous Materials Removal Drawings.

1. Interior and exterior paint surface tests and other lead-containing materials (LCM) (e.g., ceramic tiles) using and XRF measured at a variety of lead levels with results ranging from 8.4 milligrams per square centimeter (mg/cm^2) to less than the detectable level. In addition, lead-containing paint (LCP) and LCM bulk QA samples indicate analytical results were all less than the lab reporting limit. Metallic lead wrapped vent pipes were observed on the roof that may be impacted by the Work. The lead sampling data is included in the Limited Hazardous Material Survey Report which is provided as an appendix to this Specification Section.

2. Based on the specified work scope that includes limited demolition, the Contractor will as a minimum:

a Accomplish initial exposure assessments for each category of lead work (disturbance) in accordance with WAC 296-155-176.

b Accomplish dust control using wet methods or as required in accordance with WAC 296-155-176.

c Accomplish waste stream sampling as needed for hazardous lead concentrations in accordance with WAC 173-303.

3. All construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of all fugitive dust and to comply with the most recent regulations concerning respirable dust from the L&I DOSH and the Puget Sound Clean Air Agency (PSCAA) and any other applicable federal, state and local government agencies. The Contractor is responsible for cleaning all areas affected by any fugitive dust from the proposed contract work.

4. L&I DOSH requires employers to conduct a hazard assessment and take appropriate worker protection precautions whenever paint is disturbed that has detectable concentrations of lead. Since the type of work planned (e.g., demolition) will disturb the LCP/LCM, the contractor should perform an initial exposure assessment to determine if personal protective measures and work practices are required.

5. It is the Contractor's responsibility to insure all subcontractors disturbing LCP/LCM are included in the Section 028300 pre-work submittals.

1.5 PCB BALLAST AND MERCURY LIGHT TUBE AND THERMOSTAT REMEDIATION

A The Owner's Hazardous Materials Consultant inspected a representative number of fluorescent light fixture ballasts and found ballasts were both electronic and magnetic. Electronic ballasts, which contain no polychlorinated biphenyls (PCB)-containing oil, can be disposed as construction debris. Magnetic ballasts are assumed to be PCB-containing. Also, no oil filled transformers with potential PCB-containing oil that might be impacted by the Work were observed during the inspection.

B The work requires the disturbance and the recycling of Mercury (Hg)-containing light tubes, high intensity discharge (HID) lamps, compact fluorescent light (CFL) bulbs, Hg-containing thermostats, and the disposal of PCB-containing fluorescent light ballasts from Fire Station #66 as specified herein. PCB-containing light ballast, Hg-light tube, HID lamp, and CFL work shall be performed in accordance with all current applicable regulations and these specifications. These work activities are identified as specified in Section 028500 and the Hazardous Materials Removal Drawings.

1.6 CONTRACTOR'S USE OF PREMISES

A No work impacting ACM's, nor LCM/LCP, is to occur at Fire Station #66, except during the contract period.

1. Refer to Section 011100, Summary of Work for additional requirements related to the Contractor's use of the premises.

1.7 SEGREGATION OF WORK AREAS

1. Segregate work areas from the surrounding occupied and unoccupied areas using dust proof partitions and critical barriers.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Appendix A

Abridged Limited Hazardous Materials Survey Report for Fire Station #66

LIMITED HAZARDOUS MATERIALS SURVEY REPORT

SOUTH KING COUNTY FIRE & RESCUE
FIRE STATION #66 CAPITAL FACILITY IMPROVEMENTS

27010 15th Avenue S
Des Moines, WA



Original Report: June 1st, 2016
Revised Report: April 4th, 2017

Prepared For:

Howard Struve
Rice Fergus Miller Architecture & Planning
275 Fifth Street, Suite 100
Bremerton, WA

EHS–International, Inc.

Limited Hazardous Materials Survey Report

South King County Fire & Rescue
Fire Station #66 Capital Facility Improvements
27010 15th Avenue S.
Des Moines, Washington

EHSI Project No.: # 10854

The material and data in this report were prepared under the supervision and direction of the undersigned.

Report Approved By:



Derica Escamilla
Hazardous Materials Services Manager

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D ..... Laboratory Certifications for Asbestos, and Lead Analysis
E ..... Sample Location Drawings for Asbestos, Lead, and Arsenic

ACRONYM LIST

ACM.....Asbestos-Containing Material
AHERA .....Asbestos Hazard Emergency Response Act
AIHA.....American Industrial Hygiene Association
As.....Arsenic
BMU.....Brick Masonry Unit
CAB .....Cement Asbestos Board
CFR .....Code of Federal Regulations
CMU.....Concrete Masonry Unit
DOSH.....Washington State Department of Labor and Industries, Division of Occupational Safety and Health
EA .....Each
Ecology .....Washington State Department of Ecology
EHSI .....EHS-International, Inc.
ELLAP.....Environmental Lead Laboratory Accreditation Program
GWB .....Gypsum Wall Board
Hg .....Mercury
JC.....Joint Compound
LCM .....Lead-Containing Material
LCP.....Lead-Containing Paint
L&I .....Washington State Department of Labor and Industries
mg/L.....Milligrams Per Liter
mg/m^3.....Milligrams Per Cubic Meter
N/A.....Not Applicable
ND.....None Detected
NVL .....NVL Laboratories, Inc.
NVLAP.....National Voluntary Laboratory Accreditation Program
OD.....Outside Diameter
OSHA.....US Occupational Safety and Health Administration
Pb .....Lead
PCBs.....Polychlorinated Biphenyls
PLM .....Polarized Light Microscopy
ppm.....Parts per Million
PSCAA.....Puget Sound Clean Air Agency
QA.....Quality Assurance
RCW .....Revised Code of Washington
SACT.....Suspended Acoustical Ceiling Tiles
SAT .....Seattle Asbestos Test, LLC
SF .....Square Feet
SVF.....Sheet Vinyl Flooring
TCLP .....Toxic Characteristic Leachate Procedure
TSI .....Thermal System Insulation
VCT .....Vinyl Composite Tile
WAC .....Washington Administrative Code
WT .....Weight
w/ .....With
XRF .....x-ray fluorescence

1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND

The South King County Fire & Rescue (SKC F&R) has contracted Rice Fergus Miller Architecture & Planning (RFMA) to design the Fire Station #66 (FS #66) renovation project located at 27010 15th Avenue S in Des Moines, WA. In conjunction with that project, RFMA contracted EHS-International, Inc. (EHSI), a hazardous materials and industrial hygiene consulting firm, to conduct a Limited Hazardous Materials Survey. The intent of the survey is to specifically identify and quantify asbestos-containing building materials (ACM), lead-containing paint (LCP), other lead-containing building materials (LCM), arsenic-containing brick mortar, polychlorinated biphenyl (PCB)-containing light ballasts, and mercury (Hg)-containing light tubes and lamps that may be impacted by the project.

1.2 EXTENT OF CURRENT SURVEY

EHSI inspected all accessible interior and exterior materials potentially impacted by the proposed project. Accessible suspect materials were sampled including, but not limited to: interior wall systems, ceiling and floor systems, duct sealant, thermal system insulation (TSI) on piping, interior and exterior caulking, window glazing putty, brick mortar, and roofing materials and sealants. EHSI accomplished representative destructive inspection; however, in areas inaccessible for inspection (e.g., fire door cores, wall cabinet mastics, electrical panel components and materials above hard lid ceilings) suspect materials were assumed to be ACM.

1.3 MATERIALS FOUND

SUMMARY OF ASBESTOS-CONTAINING MATERIALS FIRE STATION #66	
ASBESTOS MATERIAL DESCRIPTION	**LOCATION**
Interior	
Non-ACM off-white SVF (with broken rock pattern) with non-ACM gray paper backing with non-ACM yellow mastic on **ACM black mastic** on concrete	Lunch Room, Vestibules, Kitchen, Game Room, Lunch Room
ACM dark gray/dark brown door frame caulking on single metal and wood-framed doors (both interior and exterior)	Throughout
ACM dark gray/black door frame caulking on double metal and wood-framed doors (both interior and exterior)	Hose Tower, Hose Tower 4th Floor, and Day Room Closet
ACM dark gray/dark brown door frame caulking on large 5'x14' wood entry door system	Apparatus Bay
ACM beige pipe dope on **ACM brown pipe dope** on 2" natural gas line fittings	Throughout
ACM dark gray window frame caulking with exterior ACM gray window glazing putty on 2'x3' metal-framed windows	Hose Tower
ACM black asphaltic seam sealant on non-ACM gray seam sealant on and around 2'x2' roof drain (above drop ceilings)	P.T. Area, P.T. Area Restroom, Bunk Room, and S.R. 3, Shop, Day Room, and Kitchen

SUMMARY OF ASBESTOS-CONTAINING MATERIALS FIRE STATION #66	
ASBESTOS MATERIAL DESCRIPTION	**LOCATION**
ACM hard mudded TSI on small bore pipe elbows and fittings with lagging on fiberglass runs (concealed in plumbing walls, above hard lid and drop ceiling, and below kitchen sink)	Throughout
ACM dark gray/gray seam sealant along brick and CMU wall seams	Throughout
ACM gray/brown window glazing putty on 5'x1' metal framed windows	Top of Hose Tower
ACM gray/brown window glazing putty on 3½'x1' metal framed windows	Top of Hose Tower
Assumed ACM mastic associated with 2'x3 wall mirrors	North Men's RR and South Men's RR
Assumed ACM internal components in 3'x4'x2' unit heaters	Apparatus Bay
Assumed ACM glue dots associated with 3' tall wall cabinet and counter system	Bunk Room Corridor
Assumed ACM glue dots associated with 3' tall lower wall cabinet systems	Kitchen & Shop
Assumed ACM glue dots associated with 4' tall upper wall cabinet system	Utility
Assumed ACM glue dots associated with 6' tall upper & lower wall cabinet systems	Kitchen & Shop
Assumed ACM glue dots associated with 8' tall wall cabinet systems	Bunk Room & Lunch Room, & Shift Office
Assumed ACM internal components in electrical panel	Throughout
Assumed ACM internal components in large electrical panels and large electrical switch gear panels	Shop, P.T. Area, & Elec/Mech. Room
Assumed ACM core single fire doors	Throughout
Assumed ACM core double fire door and frame	Hose Tower
2½'x1½'x6' Natural gas furnace with assumed ACM internal components and sealants	Electrical/Mechanical Room
6"x18" In slab metal ducting with assumed ACM ducting insulation and seam sealants	Throughout
Exterior	
ACM black seam sealant between concrete panels and brick walls	Throughout Exterior
ACM white seam sealant between concrete panel seams	Throughout Exterior
Gray CAB on non-ACM silver foil with paint with non-ACM yellow foam insulation with non-ACM silver foil on concrete foundation	Throughout Exterior Southern Portion of FS 22
Assumed ACM internals in 4'x3'x3' generator	Parking Lot, East of P.T. Area
Roof	
Assumed ACM internals in 6'x4'x3' heat pump	Above Bunk Room

Key: ACM = asbestos-containing material, **CAB** = cement asbestos board, **CMU** = cement masonry unit, **SVF** = sheet vinyl flooring, **TSI** = thermal system insulation

1.4 OPINIONS AND RECOMMENDATIONS

This will be a renovation project, therefore, EHSI recommends that all impacted ACM and assumed ACM identified in paragraph 1.3 be removed and disposed prior to demolition/renovation.

Any suspect materials not identified as having been surveyed in this report must be treated as an ACM until determined otherwise by a Certified Asbestos Building Inspector and NVLAP certified laboratory.

Washington State Department of Labor and Industries (L&I) Division of Occupational Safety and Health (DOSH) and the US Occupational Safety and Health Administration (OSHA) require employers to conduct a hazard assessment and take appropriate worker protection precautions whenever building materials are disturbed that have detectable quantities of lead. Since the type of work planned (e.g., sawing, grinding, demolition) will disturb the lead-containing paint and materials, the contractor should perform an initial exposure assessment to determine if personal protective measures and work practices are required. Based on the planned work and the levels of Lead, it is possible that lead exposures could exceed the DOSH action level of 30 micrograms per cubic meter ($\mu g/m^3$). Special care should be taken to reduce potential employee exposure to lead when demolishing ceramic tile and porcelain bathroom fixtures, including reducing airborne dust (e.g., water misting and use of hand tools, or demolition from a distance {Excavator}).

Magnetic fluorescent light ballasts that will be disturbed during the project are assumed to contain greater than two parts per million (> 2 ppm) PCB-dielectric oil and must be disposed or recycled as Washington Department of Ecology (Ecology) Dangerous Waste. In addition, all fluorescent tubes and lamps contain mercury. Any fluorescent lamps/tubes to be disturbed during the project must be recycled as Ecology Universal Waste.

1.5 LIMITATIONS/DISCLAIMER

This report does **not** represent a comprehensive hazardous materials investigation for the subject property. This investigation has been conducted by EHSI under a specific scope of work authorized by SKC F&R for a specific purpose. Due to continued occupancy, fire door cores, cabinet mastics, electrical panel components and materials above hard lid ceilings were not sampled and are assumed to be ACMs. This report and accompanying appendices include the supporting information for this executive summary.

2.0 LIMITED HAZARDOUS MATERIALS SURVEY REPORT

2.1 BACKGROUND

The SKC F&R has contracted RFMA to design the FS #66 renovation project located at 27010 15th Avenue S. in Des Moines, WA. In conjunction with that project, RFMA, Inc. contracted EHSI, a hazardous materials and environmental consulting firm, to accomplish a pre-renovation limited hazardous materials survey of the existing FS #66 Building. For the limited hazardous materials survey, EHSI was tasked to use applicable federal, state and local guidelines in the accomplishment of its survey. EHSI was further tasked to provide a written survey report including: identification of all suspect materials; a determination of whether suspect materials were: asbestos-containing materials (ACM), lead-containing paint (LCP), lead-containing materials (LCM), Arsenic (As)-containing brick mortar, polychlorinated biphenyl (PCB)-containing light ballasts and Mercury (Hg)-containing light tubes/lamps; and to provide analytical reports indicating the presence and quantity of the hazardous materials.

This Limited Hazardous Materials Survey Report meets the Washington State “Good Faith Survey” requirements as cited in Revised Code of Washington (RCW) 49.26.016 and implemented by Department of Labor and Industries Division of Occupational Safety and Health (L&I DOSH) regulation, Washington Administrative Code (WAC) 296-62-07721, and Regulation III, Article 4 of the Puget Sound Clean Air Agency (PSCAA).

On May 3rd and 4th, 2016 EHSI conducted a Limited Hazardous Materials (ACM, LCP, LCM, As-containing brick mortar and PCB-ballasts and Hg-containing light tubes) Survey of FS #66. On March 15th, 2017 EHSI conducted a final design check of FS #66.

2.2 BUILDING DESCRIPTION

FS #66 is located at 27010 15th Avenue S., Des Moines, Washington. The facility is comprised of a single-story brick and concrete structure with a four-story brick hose tower. The roofing system is composed of thermoplastic membrane roofing on built-up asphaltic roofing. Windows are metal-framed and partially operable. The exterior finishes include brick, concrete panels, and wood siding. Heat is provided by a furnace in the Electrical/Mechanical Room and a heat pump on the roof; hot water is provided by hot water tanks in the Electrical/Mechanical Room.

Interior finishes include the ceiling system composed of “hard lid”, a drop ceiling w/ suspended acoustic ceiling tile (SACT), and exposed wood panel decking. The wall system is a combination of gypsum wall board (GWB), ceramic wall tile, concrete masonry units (CMU) and brick. The flooring system is comprised of carpet on concrete, sheet vinyl flooring (SVF) on concrete, ceramic floor tile, and exposed concrete.

2.3 SAMPLING METHODOLOGY

2.3.1 *Asbestos-Containing Materials*

The EHSI field inspectors are asbestos Building Inspectors, certified under the requirements of the United States Environmental Protection Agency (USEPA) AHERA regulation 40 Code of Federal Regulations (CFR) 763, Subpart E. Copies of their certificates are provided in Appendix C. The number of bulk samples collected and their locations are based on the AHERA regulation and the guidelines provided by the USEPA Document 560/5-85-030a, October 1985, *Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials*.

EHSI collected samples and obtained analytical data for suspect ACM identified in the facility. Once collected, each bulk sample was sealed in an unadulterated plastic bag to eliminate the possibility of cross-contamination. “Chain-of-Custody” tracking was followed to maintain sample integrity during handling and data reporting at EHSI and the analytical laboratory. As specified in 40 CFR Chapter 1 (1-1-87 edition) Part 763, Subpart F, and Appendix A, each sample was analyzed using polarized light microscopy (PLM) / dispersion staining techniques, in accordance with USEPA Method 600/R-93/116. Samples were analyzed for asbestos content by Seattle Asbestos Test, LLC (SAT) located in Seattle, Washington. SAT participates in the NVLAP. Only materials containing more than 1% total asbestos were classified as “asbestos-containing” based on USEPA, state, and local regulations.

Samples in the report labeled as ##QA are quality assurance (QA) samples. Split samples were taken from the same location and they were sent to separate laboratories. QA samples were submitted to, NVL Laboratories, Inc. (NVL) in Seattle, WA, another NVLAP laboratory. Copies of both laboratories’ NVLAP certifications are included in Appendix D.

2.3.2 *Lead-Containing Paint/Lead-Containing Materials*

EHSI used a Niton Model XLp x-ray fluorescence (XRF) Spectrum Analyzer to measure lead content on interior and exterior paint coatings and other suspect LCM. Measurements were representative of all layers of paint and/or LCM. A summary of Lead Paint XRF results is provided in Table 3. Bulk quality assurance samples were taken for a representative number of LBP and LCM and were brought to NVL located in Seattle, Washington, an accredited laboratory for Atomic Absorption Spectroscopy (USEPA Method-7000B) by the American Industrial Hygiene Association (AIHA) under the Environmental Lead Laboratory Accreditation Program (ELLAP). Copies of laboratory reports and field data forms for lead are in Appendix B.

2.3.3 *Arsenic-Containing Materials*

EHSI collected samples and obtained analytical data for brick mortar and concrete masonry unit (CMU) mortar from the building walls. Once collected, each bulk sample was sealed in an unadulterated plastic bag to eliminate the possibility of cross-contamination. “Chain-of-Custody” tracking was followed to maintain sample integrity during handling and data reporting at EHSI and the analytical laboratory. A summary of Arsenic laboratory results is provided in Table 4. Samples were brought to NVL, an accredited laboratory for Inductively Coupled Plasma Spectroscopy (USEPA Method-6010) by the Washington State Department of Ecology. Copies of laboratory reports and field data forms for Arsenic are in Appendix B.

2.4 SAMPLING RESULTS

2.4.1 *Asbestos-Containing Materials*

Ninety-seven (97) bulk samples of suspect ACM were collected as part of the original survey. Five (5) of those samples were split for quality assurance analyses. Five (5) additional bulk samples of suspect ACM were collected as part of the design check. Limited destructive inspection was conducted to identify hidden and/or concealed materials. Copies of the asbestos analytical laboratory results are included in Appendix A. Asbestos and lead sample location drawings are provided in Appendix E. Asbestos sampling information including: sample number, material description, sample location, and analytical results are summarized in Table 1. The ACM and assumed ACM identified during this survey, including the quantity and location, is summarized in Table 2. Suspect materials not sampled due to continued occupancy were assumed to be ACM.

TABLE 1
SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS
FIRE STATION #66

SAMPLE NUMBER	SAMPLE LOCATION	MATERIAL DESCRIPTION	ASBESTOS %	TYPE OF ASBESTOS
Interior				
10854-01	Watch Office	Layer 1: Multi-colored carpet Layer 2: White woven carpet pad Layer 3: Tan mastic (on concrete)	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-02	Watch Office	Layer 1: 4” Black cove base Layer 2: Tan mastic Layer 3: White paint (on GWB)	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-03	**Lunch Room**	Layer 1: Off-white SVF (w/ broken rock pattern) Layer 2: Gray paper backing w/ yellow mastic **Layer 3: Black mastic (on concrete)**	L1: ND L2: ND **L3: 3%**	N/A N/A **Chrysotile**
10854-04*[1]	Vestibule	Layer 1: 4” Brown cove base Layer 2: Beige mastic Layer 3: Brown mastic Layer 4: Tan JC w/ paint	L1: ND L2: ND L3: ND L4: 0.25%	N/A N/A N/A Chrysotile
10854-05	Former East RR, Now Storage	Layer 1: 1”x1” Off-white ceramic floor tile Layer 2: Gray grout Layer 3: Gray mortar	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-06*	Former East RR, Now Storage	Layer 1: 6”x6” Pink ceramic wall tile (used as cove base) Layer 2: Tan mastic	L1: ND L2: 0.75%	N/A Chrysotile

TABLE 1
SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS
FIRE STATION #66

SAMPLE NUMBER	SAMPLE LOCATION	MATERIAL DESCRIPTION	ASBESTOS %	TYPE OF ASBESTOS
10854-07QA	South RR	Layer 1: Gray & Orange SVF (w/ broken rock pattern) Layer 2: Gray paper backing w/ tan mastic Layer 3: Tan leveling compound Layer 4: Wood leveling debris (on concrete)	L1: ND L2: ND L3: ND L4: ND	N/A N/A N/A N/A
10854-08	P.T. Area	Layer 1: 4" Black cove base Layer 2: Beige mastic Layer 3: White paint Layer 4: Tan mastic Layer 5: Off-white JC w/ paint	L1: ND L2: ND L3: ND L4: ND L5: ND	N/A N/A N/A N/A N/A
10854-09	South Men's RR	Layer 1: Light gray SVF (w/ broken rock pattern) Layer 2: White paper backing w/ yellow mastic Layer 3: Gray leveling compound (on concrete)	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-10	P.T. Area	Layer 1: Orange carpet Layer 2: White woven carpet pad Layer 3: Tan mastic (on concrete)	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-11	South Men's RR	Layer 1: White sealant (along ceramic floor tile edges) Layer 2: Off-white grout debris	L1: ND L2: ND	N/A N/A
10854-12	North Storage	GWB w/ paint and paper (mid wall)	ND	N/A
10854-13*[1]	Former East RR, Now Storage	Layer 1: Tan JC w/ paint Layer 2: GWB w/ paper (corner wall)	L1: 0.5% L2: ND	Chrysotile N/A
10854-14	Former East RR, Now Storage	GWB w/ paint and paper (mid wall)	ND	N/A
10854-15	Bunk Room	GWB w/ paint and paper (mid wall)	ND	N/A
10854-16	S.R. 2	Layer 1: Off-white JC w/ paint and paper Layer 2: GWB w/ paint and paper (corner wall)	L1: ND L2: ND	N/A N/A
10854-17	P.T. Area	GWB w/ paint and paper (mid wall)	ND	N/A

TABLE 1
SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS
FIRE STATION #66

SAMPLE NUMBER	SAMPLE LOCATION	MATERIAL DESCRIPTION	ASBESTOS %	TYPE OF ASBESTOS
10854-18	Corridor Outside South Men's RR	Layer 1: Off-white JC w/ paint and paper Layer 2: GWB w/ paper (corner wall)	L1: ND L2: ND	N/A N/A
10854-19	South Men's RR	Layer 1: 4"x4" White ceramic wall tile Layer 2: Gray grout Layer 3: Off-white mastic w/ woven tile backing	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-20	P.T. Area	Layer 1: 4" Brown cove base Layer 2: Tan mastic Layer 3: Brown mastic	L1: ND L2: ND L3: ND	N/A N/A N/A
10854-21	South Men's RR	Layer 1: 1.5"x1.5" Off-white ceramic floor tile Layer 2: Gray grout Layer 3: Beige mastic Layer 4: Beige rubbery and woven fibrous tile backing Layer 5: Gray mortar	L1: ND L2: ND L3: ND L4: ND L5: ND	N/A N/A N/A N/A N/A
10854-22	Day Room Entrance	Layer 1: Texturing/JC w/ paint Layer 2: GWB w/ paper (corner wall)	L1: ND L2: ND	N/A N/A
10854-23	Day Room Corridor to Apparatus Bay	Layer 1: Texturing w/ paint Layer 2: GWB w/ paper (mid wall)	L1: ND L2: ND	N/A N/A
10854-24	Game Room	Layer 1: Texturing w/ paint Layer 2: GWB w/ paper (mid wall)	L1: ND L2: ND	N/A N/A
10854-25	South RR	Layer 1: White tape w/ mastic Layer 2: Beige FRP Layer 3: Yellow mastic Layer 4: White JC w/ paint Layer 5: GWB paper	L1: ND L2: ND L3: ND L4: ND L5: ND	N/A N/A N/A N/A N/A
10854-26	Kitchen	Off-white caulking along kitchen countertop and backsplash	ND	N/A
10854-27	East RR	Layer 1: Black rubbery sink drain gasket Layer 2: Clear/off-white hard sink gasket	L1: ND L2: ND	N/A N/A
10854-28	Officer's Bunk	2'x4' SACT (w/ pin hole and worm track pattern)	ND	N/A
10854-29	Utility Room	Black hard sink drain gasket	ND	N/A
10854-30	P.T. Area	Gray seam sealant (along exposed ductwork bracket)	ND	N/A

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-31	South RR	2'x4' GWB SACT w/ paper	ND	N/A
10854-32*[1]	North Men's RR	Layer 1: Tan JC w/ paint Layer 2: GWB w/ paper (ceiling edge)	L1: 0.25% L2: ND	Chrysotile N/A
10854-33	North Men's RR	GWB w/ paint and paper (mid ceiling)	ND	N/A
10854-34*[1]	North Men's RR	Layer 1: Tan JC w/ paint Layer 2: GWB w/ paper (ceiling seam)	L1: 0.25% L2: ND	Chrysotile N/A
10854-35QA	**Corridor to Storage**	**Dark gray door frame caulking (on single metal-framed door)**	**3%**	**Chrysotile**
10854-36	**Electrical/ Mechanical Room**	**Layer 1: Beige pipe dope Layer 2: Brown pipe dope (on 2" natural gas line fittings)**	**L1: 2% L2: 2%**	**Chrysotile Chrysotile**
10854-37	Electrical/ Mechanical Room	Tan pipe dope (on 1" natural gas line)	ND	N/A
10854-38	Day Room	Dark gray window frame caulking (5'x5' metal-framed window)	ND	N/A
10854-39	Shift Office	Black window glazing gasket (5'x5' metal-framed window)	ND	N/A
10854-40	Officer's Bunk	Beige seam sealant w/ paint (along wood wall panel seams)	ND	N/A
10854-41	Apparatus Bay	Gray duct seam sealant (6" OD)	ND	N/A
10854-42	Apparatus Bay	Gray seam sealant w/ paint (along wood support beams and wall)	ND	N/A
10854-43	Apparatus Bay	Layer 1: Red fire stop Layer 2: Trace white pipe penetration sealant	L1: ND L2: ND	N/A N/A
10854-44	Shop	Silver paint (on work bench)	ND	N/A
10854-45	**Hose Tower (2nd Floor)**	**Dark gray window frame caulking (2'x3' metal-framed window)**	**3%**	**Chrysotile**
10854-46	Hose Tower (1st Floor)	Layer 1: Gray CMU Layer 2: Gray mortar	L1: ND L2: ND	N/A N/A
10854-47	Hose Tower (1st Floor)	Layer 1: Red brick Layer 2: Gray mortar	L1: ND L2: ND	N/A N/A
10854-48	**Hose Tower (1st Floor)**	**Dark brown door frame caulking (single metal-framed door)**	**3%**	**Chrysotile**

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-49	Bunk Room	Gray duct seam sealant (2'x1' metal duct above drop-ceiling)	ND	N/A
10854-50QA[x]	**Bunk Room**	**Layer 1: Black asphaltic seam sealant w/ orange paint** Layer 2: Gray seam sealant (along 1'x1' roof drain seams)	**L1: 4%** L2: ND	**Chrysotile** N/A
10854-51	Bunk Room	Tan pipe dope (around 6" OD drain pipe fittings)	ND	N/A
10854-52	Bunk Room	Black asphaltic brittle coating w/ paint (on north CMU walls)	ND	N/A
10854-53	South RR	Layer 1: Black asphaltic brittle coating w/ paint (on north CMU walls) Layer 2: CMU wall debris	L1: ND L2: ND	N/A N/A
10854-54	P.T. Area	Layer 1: Black asphaltic brittle coating w/ paint (on north CMU walls) Layer 2: CMU wall debris	L1: ND L2: ND	N/A N/A
10854-55	P.T. Area	Layer 1: Brown paper w/ black mastic Layer 2: Yellow bat insulation	L1: ND L2: ND	N/A N/A
10854-56	P.T. Area	Layer 1: Brown paper w/ black mastic Layer 2: Pink bat insulation	L1: ND L2: ND	N/A N/A
10854-57	**Utility Area**	**Hard mudded TSI on small bore pipe fitting w/ lagging (w/ fiberglass runs)**	**6%**	**Chrysotile**
10854-58	**Utility Area**	**Hard mudded TSI on small bore pipe elbow w/ lagging (w/ fiberglass runs)**	**7%**	**Chrysotile**
10854-59	**North Men's RR**	**Hard mudded TSI on small bore pipe elbow w/ lagging (w/ fiberglass runs)**	**7%**	**Chrysotile**
10854-60	**North Men's RR**	**Hard mudded TSI on small bore pipe elbow w/ lagging (w/ fiberglass runs)**	**7%**	**Chrysotile**

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-76*	**Bunk Room**	Layer 1: Black asphaltic brittle coating w/ paint (on north CMU walls) Layer 2: CMU wall debris **Layer 3: Dark gray seam sealant along brick and CMU wall seam)**	L1: ND L2: ND **L3: 1.25%**	N/A N/A **Chrysotile**
10854-77	P.T. Room	Layer 1: Black asphaltic brittle coating w/ paint (on north CMU walls) Layer 2: CMU wall debris	L1: ND L2: ND	N/A N/A
10854-82	Apparatus Bay	Beige pipe dope (on 2" PVC water lines	ND	N/A
10854-83*	**Officer's Bunk**	**Gray seam sealant (along brick and CMU wall seam)**	**2%**	**Chrysotile**
10854-97	Hose Tower (4th Floor)	Gray hard brittle sealant material w/ sand debris	ND	N/A
10854-02C-01	Day Room	Layer 1: Multi-color cloth backing Layer 2: Black mastic/ coating (inside 1' diameter speaker box in SACT)	L1: ND L2: ND	N/A N/A
10854-02C-02	P.T. Room	Layer 1: Black coating Layer 2: Concrete wall (behind tan and white rock covered cement panels)	L1: ND L2: ND	N/A N/A
10854-02C-03	P.T. Room	Layer 1: Black coating Layer 2: Concrete wall (behind tan and white rock covered cement panels)	L1: ND L2: ND	N/A N/A
10854-02C-05	Hose Tower (4th Floor)	Black window glazing putty (on 5'x1' & 3½'x1' metal framed windows)	ND	N/A
Exterior				
10854-61	Watch Office	Black window frame caulking (5'x5' metal framed window)	ND	N/A
10854-62*	Watch Office	Beige/brown window glazing putty (5'x5' metal framed window)	0.75%	Chrysotile
10854-63	**Watch Office**	**Black seam sealant (between concrete panels and brick wall)**	**3%**	**Chrysotile**
10854-64*	**Watch Office**	**White seam sealant (between concrete panel seams)**	**1.25%**	**Chrysotile**

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-65QA[x]	**S.R. 1**	**Layer 1: Gray CAB** Layer 2: Silver foil w/ paint Layer 3: Yellow foam insulation Layer 4: Silver foil (on concrete foundation)	**L1: 19%** L2: ND L3: ND L4: ND	**Chrysotile** N/A N/A N/A
10854-66	**Hose Tower**	**Gray window glazing putty (2'x3' metal-framed windows)**	**4%**	**Chrysotile**
10854-67	Apparatus Bay	Remnant brown rubbery glue dot	ND	N/A
10854-68	**Day Room**	**Black door frame caulking (on single metal-framed door)**	**3%**	**Chrysotile**
10854-69	SE Walkway	Black asphaltic expansion joint	ND	N/A
10854-70	P.T. Area	Brown/black asphaltic paper vapor barrier	ND	N/A
10854-71	Lunch Room	Layer 1: Tan/white rock w/ paint Layer 2: Gray cement panel (w/ metal frame and lath)	L1: ND L2: ND	N/A N/A
10854-72	Day Room	Layer 1: Tan/white rock w/ paint Layer 2: Gray cement panel (w/ metal frame and lath)	L1: ND L2: ND	N/A N/A
10854-73	P.T. Area	Layer 1: Beige cement Layer 2: Dark gray cement Layer 3: Gray cement panel (w/ metal frame and lath) Layer 4: Brown paper vapor barrier	L1: ND L2: ND L3: ND L4: ND	N/A N/A N/A N/A
10854-74	Watch Office	Layer 1: Beige cement Layer 2: Gray cement panel (w/ metal frame and lath)	L1: ND L2: ND	N/A N/A
10854-75	Day Room	Layer 1: Tan/white rock w/ paint Layer 2: Beige cement Layer 3: Dark gray cement Layer 4: Gray cement panel (w/ metal frame and lath)	L1: ND L2: ND L3: ND L4: ND	N/A N/A N/A N/A
10854-02C-04	**Hose Tower**	**Gray/brown window glazing putty (on 5'x1' & 3½'x1' metal framed windows)**	**3%**	**Chrysotile**
Roof				

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-78	Above Shift Office	Black rubbery seam sealant (along flashing seams)	ND	N/A
10854-79	Above Apparatus Bay	Light gray seam sealant (along vent hoods and steel reinforcements penetrating Hose Tower)	ND	N/A
10854-80	Above Apparatus Bay	White seam sealant (on vent pipes and membrane roofing)	ND	N/A
10854-81	Above Officer's Bunk	Black hard seam sealant on large vent hoods)	ND	N/A
10854-84	Above Lunch Room	Layer 1: White membrane roofing Layer 2: Clear mastic Layer 3: White fibrous vapor barrier Layer 4: White Densdeck® Layer 5: White fibrous vapor barrier Layer 6: Black asphaltic built up roofing w/ vapor barrier Layer 7: Black asphaltic cap sheet Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier Layer 9: Black asphaltic tar Layer 10: Brown fibrous insulation Layer 11: Black asphaltic vapor barrier Layer 12: Yellow poly-iso insulation Layer 13: Multi-layered black asphaltic built up roofing w/ vapor barrier (on wood decking)	L1: ND L2: ND L3: ND L4: ND L5: ND L6: ND L7: ND L8: ND L9: ND L10: ND L11: ND L12: ND L13: ND	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A
10854-85	Above Day Room	Layer 1: White membrane roofing Layer 2: Clear mastic Layer 3: White fibrous vapor barrier Layer 4: White Densdeck® Layer 5: White fibrous vapor barrier	L1: ND L2: ND L3: ND L4: ND L5: ND L6: ND	N/A N/A N/A N/A N/A N/A

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
		Layer 6: Black asphaltic built up roofing w/ vapor barrier	L7: ND	N/A
		Layer 7: Black asphaltic cap sheet	L8: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L9: ND	N/A
		Layer 9: Black asphaltic tar	L10: ND	N/A
		Layer 10: Brown fibrous insulation	L11: ND	N/A
		Layer 11: Black asphaltic vapor barrier	L12: ND	N/A
		Layer 12: Yellow polyiso insulation	L13: ND	N/A
		Layer 13: Multi layered black asphaltic built up roofing w/ vapor barrier (on wood decking)		
10854-86	Above Pantry	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Multi-layered black asphaltic built up roofing w/ vapor barrier	L7: ND	N/A
		Layer 8: Black asphaltic tar	L8: ND	N/A
		Layer 9: Brown fibrous insulation	L9: ND	N/A
		Layer 10: Black asphaltic vapor barrier	L10: ND	N/A
		Layer 11: Yellow polyiso insulation	L11: ND	N/A
		Layer 12: Multi layered black asphaltic built up roofing w/ vapor barrier (on wood decking)	L12: ND	N/A
10854-87	Above Apparatus Bay NW	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Black asphaltic tar	L7: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L8: ND	N/A
		Layer 9: Black asphaltic cap sheet (on wood decking)	L9: ND	N/A
10854-88	Above Apparatus Bay West	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: Black asphaltic tar	L3: ND	N/A
		Layer 4: Trace brown mastic	L4: ND	N/A
		Layer 5: Wood parapet debris	L5: ND	N/A
10854-89	Above Apparatus Bay SW	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Multi-layered black asphaltic built up roofing w/ vapor barrier	L7: ND	N/A
		Layer 8: Black asphaltic tar	L8: ND	N/A
		Layer 9: Brown fibrous insulation	L9: ND	N/A
		Layer 10: Black asphaltic vapor barrier	L10: ND	N/A
		Layer 11: Yellow polyiso insulation	L11: ND	N/A
		Layer 12: Multi layered black asphaltic built up roofing w/ vapor barrier (on wood decking)	L12: ND	N/A
10854-90	Above Apparatus Bay SE	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
			L5: ND	N/A

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
		Layer 5: White fibrous vapor barrier	L6: ND	N/A
		Layer 6: Black asphaltic cap sheet	L7: ND	N/A
		Layer 7: Black asphaltic tar	L8: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L9: ND	N/A
		Layer 9: Black asphaltic cap sheet (on wood decking)		
10854-91	Above Apparatus Bay SE	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: Trace brown mastic (on brick hose tower)	L3: ND	N/A
10854-92	Above P.T. Area	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Black asphaltic tar	L7: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L8: ND	N/A
		Layer 9: Black asphaltic cap sheet (on wood decking)	L9: ND	N/A
10854-93	Above Bunk Room	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Black asphaltic tar	L7: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L8: ND	N/A
		Layer 9: Black asphaltic cap sheet (on wood decking)	L9: ND	N/A

TABLE 1 SUMMARY OF ASBESTOS BULK SAMPLING AND ANALYTICAL RESULTS FIRE STATION #66				
SAMPLE NUMBER	**SAMPLE LOCATION**	**MATERIAL DESCRIPTION**	**ASBESTOS %**	**TYPE OF ASBESTOS**
10854-94	Above S.R. 3	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: Black asphaltic tar	L3: ND	N/A
		Layer 4: Trace brown mastic	L4: ND	N/A
		Layer 5: Wood parapet debris	L5: ND	N/A
10854-95	Above Hose Tower	Layer 1: White membrane roofing	L1: ND	N/A
		Layer 2: Clear mastic	L2: ND	N/A
		Layer 3: White fibrous vapor barrier	L3: ND	N/A
		Layer 4: White Densdeck®	L4: ND	N/A
		Layer 5: White fibrous vapor barrier	L5: ND	N/A
		Layer 6: Black asphaltic cap sheet	L6: ND	N/A
		Layer 7: Black asphaltic tar	L7: ND	N/A
		Layer 8: Multi-layered black asphaltic built up roofing w/ vapor barrier	L8: ND	N/A
		Layer 9: Black asphaltic cap sheet (on wood decking)	L9: ND	N/A
10854-96QA	Above Hose Tower	Gray/black asphaltic seam sealant w/ fibrous sealant (around 4' OD vent hood)	ND	N/A

Key: CAB = cement asbestos board, **CMU** = concrete masonry unit, **FRP** = fiber reinforced panel, **JC**=joint compound, **GWB**=gypsum wall board, **N/A** = not applicable, **ND** = none detected, **OD** = outside diameter, **PVC** = polyvinyl chloride, **SACT** = suspended acoustical ceiling tile, **SVF** = sheet vinyl flooring, **TSI** = thermal system insulation, **w/**=with

[X] When QA lab and primary lab sample results differed, EHSI reported the most restrictive (e.g., highest % asbestos) in Table 1. Analytical results for all analyses are provided in Appendix A.

* EHSI re-submitted samples for re-analysis using the more precise EPA "Point Count" method. The "Point Count" analytical method is recommended by the EPA for samples with less than 10% asbestos.

[1] Preliminary analytical reports indicated that the tan JC found on the GWB walls in Fire Station #66, contained approximately 2% Chrysotile asbestos. EHSI re-submitted the JC samples reported to have greater than 1% asbestos concentration for re-analysis using the more precise EPA "Point Count" method. The "Point Count" analytical method is recommended by the EPA for samples with less than 10% asbestos. Based on the results of that re-analysis, the JC found on GWB walls were determined to be non-ACM (e.g., containing < 1% asbestos fibers) and are therefore not ACM "surfacing materials". Only the "Point Count" re-analysis

concentrations are listed in Table 1. Analytical results for all analyses are provided in Appendix A.

Washington State Department of Labor and Industries Division of Occupational Safety and Health (L&I DOSH) requires special worker exposure precautions and qualifications when dealing with ACM used on seams and nail holes (refer to L&I DOSH regulations and WISHA Regional Directives {WRD}). Similar requirements exist for walls and ceilings skim-coated with material that contains less than one percent (<1%) asbestos fibers. Any "dust creating activity", such as: sanding, sawing, grinding, or drilling of GWB walls or ceilings shall be accomplished by certified asbestos workers using glove-bag, mini-enclosure and/or negative pressure enclosure engineering controls and work practices. As directed by WRD 23.30, for all other demolition or disturbance of GWB walls/ceilings with ACM JC or of walls/ceilings skim coated with <1% asbestos, employees shall have received at least two hours of asbestos awareness training as specified L&I DOSH Instruction WAC 296-62-07722(5).

Table 2 summarizes materials identified by EHSI as containing greater than 1% asbestos fibers during its survey, and un-sampled materials assumed to be ACM. **The Table 2 Summary of Asbestos Containing Materials is for engineering cost estimating purposes and is not intended for bid quantifications.**

TABLE 2
SUMMARY OF ASBESTOS-CONTAINING MATERIALS
FIRE STATION #66

ASBESTOS MATERIAL DESCRIPTION	LOCATION	QUANTITY EXPECTED TO BE IMPACTED
Interior		
Non-ACM off-white SVF (with broken rock pattern) with non-ACM gray paper backing with non-ACM yellow mastic on **ACM black mastic** on concrete	Lunch Room, Vestibules, Kitchen, Game Room, Lunch Room	1,500 SF
ACM dark gray/dark brown door frame caulking on single metal and wood-framed doors (both interior and exterior)	Throughout	14 EA
ACM dark gray/black door frame caulking on double metal and wood-framed doors (both interior and exterior)	Hose Tower, Hose Tower 4th Floor, and Day Room Closet	3 EA
ACM dark gray/dark brown door frame caulking on large 5'x14' wood entry door system	Apparatus Bay	1 EA
ACM beige pipe dope on **ACM brown pipe dope** on 2" natural gas line fittings	Throughout	75 EA
ACM dark gray window frame caulking with exterior ACM gray window glazing putty on 2'x3' metal-framed windows	Hose Tower	6 EA
ACM black asphaltic seam sealant on non-ACM gray seam sealant on and around 2'x2' roof drain (above drop ceiling)	P.T. Area, P.T. Area Restroom, Bunk Room, and S.R. 3, Shop, Day Room, and Kitchen	40 SF

TABLE 2 SUMMARY OF ASBESTOS-CONTAINING MATERIALS FIRE STATION #66		
ASBESTOS MATERIAL DESCRIPTION	**LOCATION**	**QUANTITY EXPECTED TO BE IMPACTED**
ACM hard mudded TSI on small bore pipe elbows and fittings with lagging on fiberglass runs (concealed in plumbing walls, above hard lid and drop ceiling, and below kitchen sink)	Throughout	150 EA
ACM dark gray/gray seam sealant along brick and CMU wall seams	Throughout	500 LF
ACM gray/brown window glazing putty on 5'x1' metal framed windows	Top of Hose Tower	4 EA
ACM gray/brown window glazing putty on 3½'x1' metal framed windows	Top of Hose Tower	4 EA
Assumed ACM mastic associated with 2'x3 wall mirrors	North Men's RR and South Men's RR	2 EA
Assumed ACM internal components in 3'x4'x2' unit heaters	Apparatus Bay	2 EA
Assumed ACM glue dots associated with 3' tall wall cabinet and counter system	Bunk Room Corridor	21 SF
Assumed ACM glue dots associated with 3' tall lower wall cabinet systems	Kitchen & Shop	60 SF
Assumed ACM glue dots associated with 4' tall upper wall cabinet system	Utility	40 SF
Assumed ACM glue dots associated with 6' tall upper & lower wall cabinet systems	Kitchen & Shop	180 SF
Assumed ACM glue dots associated with 8' tall wall cabinet systems	Bunk Room & Lunch Room, & Shift Office	330 SF
Assumed ACM internal components in electrical panel	Throughout	1 EA
Assumed ACM internal components in large electrical panels and large electrical switch gear panels	Shop, P.T. Area, & Elec/Mech. Room	5 EA
Assumed ACM core single fire doors	Throughout	11 EA
Assumed ACM core double fire door and frame	Hose Tower	1 EA
2.5'x1.5'x6' Natural gas furnace with assumed ACM internal components and sealants	Electrical/Mechanical Room	1 EA
6"x18" In slab metal ducting with assumed ACM ducting insulation and seam sealants	Throughout	50 LF (400 LF NIS)
Exterior		
ACM black seam sealant between concrete panels and brick walls	Throughout Exterior	400 LF
ACM white seam sealant between concrete panel seams	Throughout Exterior	100 LF
Gray CAB on non-ACM silver foil with paint with non-ACM yellow foam insulation with non-ACM silver foil on concrete foundation	Throughout Exterior Southern Portion of FS 22	350 SF
Assumed ACM internals in 4'x3'x3' generator	Parking Lot, East of P.T. Area	1 EA

TABLE 2 SUMMARY OF ASBESTOS-CONTAINING MATERIALS FIRE STATION #66		
ASBESTOS MATERIAL DESCRIPTION	**LOCATION**	**QUANTITY EXPECTED TO BE IMPACTED**
Roof		
Assumed ACM internals in 6'x4'x3' heat pump	Above Bunk Room	1 EA

Key: ACM = asbestos-containing material, **CAB** = cement asbestos board, **CMU** = cement masonry unit, **EA** = each, **LF** = linear feet, **NIS** = not in scope, **SF** = square feet, **SVF** = sheet vinyl flooring, **TSI** = thermal system insulation

ACM identified in this survey should not be disturbed unless handled by personnel who are properly trained and certified in asbestos work. Demolition and/or renovation activities by contractors may expose concealed suspect ACM. Contractors should be aware of the potential for concealed suspect ACM and have preplanned contingencies for the handling of suspect ACM discovered during renovation and/or demolition work. Any concealed suspect ACM material that was not sampled or was assumed to be ACM and included in this report, must be treated as ACM until proven otherwise by a Certified AHERA Building Inspector and a certified laboratory. Contingency plans should include stopping work on identification of concealed suspect ACM, evacuation of the area, and sampling by a Certified AHERA Building Inspector. Concealed suspect material may include, but is not limited to: non-fiberglass pipe or roof drain insulation; spray-applied coatings; cementitious board; asphalt or paper vapor barriers; vinyl floorings and mastics.

2.4.2 *Lead-Containing Paint and Building Materials*

Forty-eight (48) samples were analyzed for lead using the X-Ray fluorescence (XRF) analyzer. Results marked with "≤LOD" are less than the limit of detection. XRF paint sample results ranged from 0.15 milligrams of lead per square centimeter (mg Pb/cm^2) to less than the LOD and sample results for lead-containing materials ranged from 8.4 milligrams of lead per square centimeter (mg Pb/cm^2) to less than the LOD all ≤ LOD. **Bolded results indicate materials coated with "lead-based paint" (e.g., >1.0 mg/cm^2) as defined by USEPA regulation 40CFR745 and Washington State Department of Commerce (Commerce) regulation WAC 365-230.** XRF readings for other lead-containing materials were < LOD.

Table 3 summarizes XRF lead samples, including sample number, material description, substrate, color, location and analytical results.

TABLE 3 XRF SAMPLING SUMMARY OF PAINTED COMPONENTS AND MATERIALS FIRE STATION #66						
Read. #	**Component**	**Substrate**	**Color**	**Room**	**Building**	**Lead Conc. (mg/cm^2)**
1	SHUTTER-CALIBRATION	N/A	N/A	N/A	N/A	0.28
2	CALIBRATION	N/A	RED	N/A	N/A	0.9
3	CALIBRATION	N/A	RED	N/A	N/A	1.0
4	CALIBRATION	N/A	RED	N/A	N/A	0.9
5	WALL	DRYWALL	WHITE	SHIFT OFFICE	FS 66	0.04
6	WALL	CMU	WHITE	WATCH OFFICE	FS 66	< LOD

TABLE 3
XRF SAMPLING
SUMMARY OF PAINTED COMPONENTS AND MATERIALS
FIRE STATION #66

Read. #	Component	Substrate	Color	Room	Building	Lead Conc. (mg/cm^2)
7	CEILING	DRYWALL	TAN	WATCH OFFICE	FS 66	0.05
8	WALL	BRICK	BROWN	SHIFT OFFICE	FS 66	< LOD
9	WALL	MORTAR	LIGHT GRAY	SHIFT OFFICE	FS 66	< LOD
10	WALL	DRYWALL	BEIGE	LUNCH ROOM	FS 66	< LOD
11	WALL	CMU	BEIGE	LUNCH ROOM	FS 66	< LOD
12	**SINK**	**CERAMIC**	**WHITE**	**NW MEN'S RR**	**FS 66**	**2.9**
13	**TOILET**	**CERAMIC**	**WHITE**	**NW MEN'S RR**	**FS 66**	**1.0**
14	FLOOR	CERAMIC	LIGHT BROWN	NW MEN'S RR	FS 66	< LOD
15	**WALL**	**CERAMIC**	**WHITE**	**NW MEN'S RR**	**FS 66**	**7.9**
16	**COVE BASE**	**CERAMIC**	**LIGHT PINK**	**NW MEN'S RR**	**FS 66**	**8.1**
17	URINAL	CERAMIC	WHITE	NE MEN'S RR	FS 66	< LOD
18	**COVE BASE**	**CERAMIC**	**TAN**	**NE MEN'S RR**	**FS 66**	**7.8**
19	WALL	DRYWALL	OFF-WHITE	NE MEN'S RR	FS 66	0.06
20	**WINDOW SILL**	**CERAMIC**	**SALMON**	**DAY ROOM**	**FS 66**	**8.4**
21	FLOOR	CONCRETE	YELLOW	APPARATUS BAY	FS 66	< LOD
22	FLOOR	CONCRETE	RED	APPARATUS BAY	FS 66	< LOD
23	ROLL UP DOOR	WOOD	BEIGE	APPARATUS BAY	FS 66	< LOD
24	CASEWORK	WOOD	RED	SHOP	FS 66	< LOD
25	COUNTERTOP	METAL	SILVER	SHOP	FS 66	< LOD
26	ELECTRICAL PANEL	METAL	SILVER	SHOP	FS 66	< LOD
27	TRANSFER SWITCH BOX	METAL	TEAL	SHOP	FS 66	< LOD
28	DOOR FRAME	METAL	BROWN	BUNK ROOM	FS 66	0.15
29	WALL	CERAMIC	WHITE	SW MEN'S RR	FS 66	< LOD
30	FLOOR	CERAMIC	OFF-WHITE	SW MEN'S RR	FS 66	< LOD
31	SINK	CERAMIC	WHITE	SW MEN'S RR	FS 66	< LOD
32	CEILING	SACT	WHITE	BUNK ROOM	FS 66	< LOD
33	CEILING	SACT TRACK	BEIGE	BUNK ROOM	FS 66	< LOD
34	WALL	DRYWALL	YELLOW	BUNK ROOM RR	FS 66	< LOD
35	WALL	DRYWALL	BEIGE	PT ROOM	FS 66	< LOD
36	DOOR	WOOD	BROWN	EXTERIOR	FS 66	< LOD
37	DOOR	WOOD	BROWN	EXTERIOR	FS 66	0.05
38	WALL	CONCRETE PANEL	BEIGE	EXTERIOR	FS 66	< LOD
39	DRAIN PIPE	PLASTIC	WHITE	EXTERIOR	FS 66	< LOD
40	EIFS GROOVE	PLASTIC	BEIGE	EXTERIOR	FS 66	0.13

TABLE 3 XRF SAMPLING SUMMARY OF PAINTED COMPONENTS AND MATERIALS FIRE STATION #66						
Read. #	**Component**	**Substrate**	**Color**	**Room**	**Building**	**Lead Conc. (mg/cm^2)**
41	WINDOW SILL	WOOD	BROWN	EXTERIOR	FS 66	0.04
42	GENERATOR POLE	METAL	YELLOW	EXTERIOR	FS 66	< LOD
43	WALL	WOOD	BEIGE	EXTERIOR	FS 66	< LOD
44	FOUNDATION BOARD	CAB	LIGHT GRAY	EXTERIOR	FS 66	< LOD
45	CALIBRATION	N/A	RED	N/A	FS 66	0.9
46	CALIBRATION	N/A	RED	N/A	FS 66	0.9
47	CALIBRATION	N/A	RED	N/A	FS 66	0.9
48	CALIBRATION	N/A	RED	N/A	FS 66	1.0

Key: CAB = cement asbestos board, **CMU** = concrete masonry unit, **GWB** = Gypsum Wallboard, **N/A** = Non-Applicable, **<LOD** = less than the limit of detection.

In addition to the XRF samples, EHSI collected four (4) bulk QA samples for laboratory analysis. Results marked with the "<" symbol are less than the detectable level. Bulk sample results ranged from 0.1700 percent lead by weight to < LOD. Building materials and paint containing detectable levels of lead are considered regulated by DOSH.

Table 4 summarizes bulk QA lead samples, including sample number, material description, substrate, color, location, and analytical results.

Copies of the analytical laboratory report and field data forms for lead paint are included in Appendix B of this report.

TABLE 4 SUMMARY OF LEAD BULK QA SAMPLING AND ANALYTICAL RESULTS FS #66					
SAMPLE NUMBER	**LOCATION**	**COMPONENT**	**SUBSTRATE**	**COLOR**	**RESULTS % Pb by WT**
10854-Pb01	Hose Tower, Interior	Wall	CMU/mortar	Gray/ gray	<0.0048
10854-Pb02	Hose Tower, Interior	Wall	Brick/mortar	Red/ gray	<0.0021
10854-Pb03	Bunk Room, Interior	Wall	GWB	White	<0.0050
10854-Pb04	Hose Tower, Exterior	Platform framing	Metal	Red	0.1700

Key: CMU = concrete masonry unit, **GWB** = gypsum wall board

DOSH requires employers to conduct a hazard assessment and take appropriate worker protection precautions whenever paint is disturbed that has detectable quantities of lead. Since the type of work planned (e.g., sawing, grinding, demolition) will disturb the lead-containing paint, the contractor should perform an initial exposure assessment to determine if personal protective measures and work practices are required.

2.4.3 *Arsenic-Containing Building Materials*

EHSI collected two (2) Arsenic bulk mortar samples for laboratory analysis. The results of those analyses are reported in Table 5.

Arsenic results for this inspection are reported in Appendix B. Table 5 summarizes Arsenic samples, including sample number, material description, substrate, color and analytical results.

TABLE 5
SUMMARY OF ARSENIC BULK SAMPLING AND ANALYTICAL RESULTS
FS #66

SAMPLE NUMBER	SAMPLE LOCATION	COMPONENT/ SUBSTRATE	COLOR	RESULTS IN PPM
10854-As01	Hose Tower Interior	CMU wall	Gray/gray	<20.0
10854-As01	Hose Tower Interior	BMU wall	Red/ gray	<20.0

Key: BMU = brick masonry unit, **CMU** = concrete masonry unit

DOSH requires employers to conduct a hazard assessment and take appropriate worker protection precautions whenever arsenic-containing materials are disturbed. Based on the absence of arsenic identified in the sample results, Arsenic worker protection and TCLP testing will not be required for this project.

2.4.4 *Toxicity Characteristic Leaching Procedure Sampling*

Ecology requires testing using the “toxicity characteristic leaching procedure” (TCLP) and segregation of construction debris if it is potentially contaminated with dangerous waste (e.g., lead-containing paint/lead-containing materials). Washington State Department of Ecology (Ecology) has set a dangerous waste threshold for both leachable arsenic and lead at 5.0 milligrams per liter (mg/L).

Because the potential waste streams will be determined by the contractor, a TCLP was not conducted as part of the Limited Hazardous Materials Survey.

2.4.5 *Polychlorinated Biphenyls*

Ballasts

Electronic and magnetic fluorescent light ballasts were observed. Magnetic fluorescent light ballasts that will be disturbed during the project are assumed to contain greater than two parts per million (> 2 ppm) PCB-dielectric oil and must be disposed or recycled as Washington Department of Ecology (Ecology) Dangerous Waste. In addition, all fluorescent tubes and lamps contain mercury. Any fluorescent lamps/tubes to be disturbed during the project must be recycled as Washington Department of Ecology (Ecology) Universal Waste. A Summary of ballasts and Hg-containing light tubes is provided in Table 6.

Transformers

EHSI did not observe any liquid-filled transformers that will be impacted by the planned work in the FS #66 Building.

2.4.6 *Mercury-Containing Fluorescent Light Tubes and Thermostats*

All fluorescent light tubes quantified in Table 6 are assumed to contain Hg; two (2) Hg-containing thermostats were also identified onsite during the survey. Hg wastes are regulated as "universal wastes" under Ecology's regulation WAC 173-303. Hg-containing building materials must be recycled or disposed of as hazardous waste. Hg-containing fluorescent light tubes are quantified in Table 6.

TABLE 6
SUMMARY OF LIGHT FIXTURE INSPECTION RESULTS
FIRE STATION #66

LIGHT TYPE	NUMBER OF FIXTURES	NUMBER OF TUBES	APPROXIMATE NUMBER OF MAGNETIC BALLASTS
4'x1' Suspended light fixture w/ 2 bulbs and 1 ballast	2	4	2
4'x1' Mounted light fixture w/ 2 bulbs and 1 ballast	4	8	4
4'x2' Suspended light fixture w/ 4 bulbs and 2 ballasts	70	280	0
4'x2' Mounted light fixture w/ 4 bulbs and 2 ballasts	12	48	0
4'x2' Recessed light fixture with 4 bulbs and 2 ballasts	140	560	0
1' HID lamps	7	7	7
CFL bulbs	37	37	0
Site Total	**272**	**944**	**13**

Key: CFL = compact fluorescent light, HID = high intensity discharge

3.0 LIMITATIONS

This survey was limited to those materials accessible using standard survey methods. Limited representative destructive inspection was accomplished; however, in areas inaccessible for inspection, (e.g., fire door cores, wall cabinet mastics, electrical and materials above hard lid ceilings) suspect materials were assumed to be ACM.

This survey was limited to the chemicals and materials identified herein. No effort was made to identify hazardous materials in soil, water, or air, other than those listed herein. Any survey regardless of how extensive can miss concealed materials. Contractors should be aware of the potential that demolition activities may expose concealed suspect ACM and should have preplanned contingencies for handling these materials when discovered during demolition work. Any concealed, suspect ACM material that was not sampled or that was assumed to be ACM by this survey report when encountered must be treated as ACM until sampled by a Certified AHERA Building Inspector and analyzed by a certified laboratory.

4.0 STANDARD OF CARE

The recommendations and conclusions contained in this report represent the professional opinions of EHSI. These opinions are derived in accordance with federal, state, and local environmental and health and safety laws and regulations. This survey was accomplished in accordance with applicable federal, state, and local regulations and industry standards in effect at the time. Other than this, no other warranty is implied or intended.

5.0 CERTIFIED AHERA BUILDING INSPECTORS

The Certified AHERA Building Inspectors listed below surveyed FS #66 on May 3rd and 4th, 2016 and again on March 15th, 2017 in accordance with federal, state, and local requirements.

Rory Peterson
Certified AHERA Building Inspector
Certificate Number: 158525
Expiration Date: August 17, 2017

Eric Arroyo
Certified AHERA Building Inspector
Certificate Number: 2016-07-29-05
Expiration Date: July 29th, 2017

Byron Wenning Jr.
Certified AHERA Building Inspector
Certificate Number: 10801-02-03
Expiration Date: December 11th, 2016

Micki Towler
Certified AHERA Building Inspector
Certificate Number: 154608
Expiration Date: December 15th, 2016

Jason Carlson
Certified AHERA Building Inspector
Certificate Number: 156719
Expiration Date: April 20th, 2017

(Note: The above report fulfills the requirements of WAC 296-62-07721 for a "Good Faith Inspection" report. Some of the report enclosures have been deleted for brevity from the Contract Specifications Appendix. The full report is available for review from Rice Fergus Miller Architects or EHS-International, Inc.).

END OF SECTION 011110

SECTION 028200 - ASBESTOS REMEDIATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The authorized work requires the disturbance, demolition, removal, and disposal of the following asbestos-containing material (ACM) from Fire Station #66, located at 27010 15th Avenue S., Des Moines, Washington; as shown on the drawings and as specified herein:

1. Non-ACM off-white sheet vinyl flooring (SVF) (with broken rock pattern) with non-ACM gray paper backing with non-ACM yellow mastic on ACM black mastic on concrete:
2. ACM dark gray/dark brown door frame caulking on single metal-framed and wood-framed doors (both interior and exterior);
3. ACM dark gray/black door frame caulking on double metal and wood-framed doors (both interior and exterior);
4. ACM dark gray/dark brown door frame caulking on large 5'x14' wood entry door system;
5. ACM beige pipe dope on ACM brown pipe dope on 2" natural gas line fittings;
6. ACM dark gray window frame caulking with exterior ACM gray window glazing putty on 2'x3' metal-framed windows;
7. ACM black asphaltic seam sealant on non-ACM gray seam sealant on and around 2'x2' roof drain (above drop ceilings);
8. ACM hard mudded thermal system insulation (TSI) on small bore pipe elbows and fittings with lagging on fiberglass runs (concealed in plumbing walls, above hard lid and drop ceiling, and below kitchen sink);
9. ACM dark gray/gray seam sealant along brick and concrete masonry unit (CMU) wall seams;
10. ACM gray/brown window glazing putty on 5'x1'metal framed windows
11. ACM gray/brown window glazing putty on 3½'x1' metal framed windows
12. Assumed ACM mastic associated with 2'x3 wall mirrors;
13. Assumed ACM internal components in 3'x4'x2' unit heaters;
14. Assumed ACM glue dots associated with 3' tall wall cabinet and counter system;
15. Assumed ACM glue dots associated with 3' tall lower wall cabinet systems;
16. Assumed ACM glue dots associated with 4' tall upper wall cabinet system;
17. Assumed ACM glue dots associated with 6' tall upper & lower wall cabinet systems;
18. Assumed ACM glue dots associated with 8' tall wall cabinet system;
19. Assumed ACM internal components in electrical panel;
20. Assumed ACM internal components in large electrical panels and large electrical switch gear panels;
21. Assumed ACM core single fire doors;
22. Assumed ACM core double fire door and frame;
23. 2½'x1½'x6' Natural gas furnace with assumed ACM internal components and sealants;
24. 6"x18" In slab metal ducting with assumed ACM ducting insulation and seam sealants;
25. Exterior ACM black seam sealant between concrete panels and brick walls;
26. Exterior ACM white seam sealant between concrete panel seams;
27. Exterior gray cement asbestos board (CAB) on non-ACM silver foil with paint with non-ACM yellow foam insulation with non-ACM silver foil on concrete foundation;
28. Assumed ACM internals in 4'x3'x3' generator in parking lot; and
29. Assumed ACM internals in 6'x4'x3' heat pump on roof.

B. In accordance with Federal, State, and local regulations, a "Good Faith Asbestos Inspection" was conducted at Fire Station #66 in preparation for the Renovation Project. A copy of the

report is included as an appendix to the Summary of Hazardous Materials Work Specification Section 011110.

1.2 SPECIAL PRECAUTIONS

A. Special precautions will be required to isolate the asbestos work within the impacted area from the un-impacted occupied areas of Fire Station #66.

B. Only workers with training in accordance with WAC 296-65-010 under the supervision of a certified asbestos supervisor with training in accordance with WAC 296--65-012 are approved to do this work. They are required to use wet methods, accomplish prompt clean-up of any debris, have appropriate respiratory protection, and an exposure assessment.

C. Less than one percent (<1%) asbestos-containing materials:

1. The selective demolition of these materials is within the scope of this project. Based on the U.S. Environmental Protection Agency (EPA) guidance, the Puget Sound Clean Air Agency (PSCAA) considers this material to be non-asbestos materials (see Limited Hazardous Materials Survey Report attached as appendix to Section 011110). Therefore, disturbance and demolition of these materials with <1% asbestos is not considered an asbestos project; however, Washington State Department of Labor and Industries Division of Occupational Safety and Health (L&I DOSH) requires special worker exposure precautions and qualifications when dealing with this detectable level of asbestos (refer to L&I DOSH regulations, and WISHA Regional Directives). Note: Debris from demolition of building materials with <1% asbestos may be disposed/recycled with normal construction debris.

2. Less than one percent (<1%) asbestos-containing exterior window glazing putty, GWB joint compound, and ceramic wall tile mastic were identified during the survey.

1.3 RELATED WORK SPECIFIED ELSEWHERE: Conform to General Conditions, Supplementary Conditions, Modifications thereto, and Division 1 – General Requirements.

A. Section 011110 Summary of Hazardous Materials Work

B. Section 028300 Lead-Containing Materials Disturbance

C. Hazardous Materials Removal Drawings

D. Architectural, Electrical, and Mechanical Design and Demolition Drawings

E. Drawings and general provisions of the Contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1. Phasing and Schedule: Phasing and Schedule in an occupied building are critical for successful completion of this project. Overtime, double-shifting, or special work schedules and coordination of phased work should be anticipated and will be required to meet deadlines. Refer to the Phasing Plans and specification Section 011100 for additional information.

1.4 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations pertaining to asbestos removal and disposal are provided in the regulations, codes and standards listed in Paragraph 1.5 of this section.

A. Hazardous Materials Consultant – The Hazardous Materials Consultant is the firm/individual responsible for review and approval of Asbestos/Hazardous Materials submittals, for technical response to asbestos/hazardous materials removal questions, for monitoring of asbestos/hazardous materials work and for final visual inspection and final air clearance monitoring as specified herein. For this project, the Hazardous Materials Consultant is EHS-International, Inc., 1011 SW Klickitat Way Suite 104, Seattle, WA, (206) 381-1128 phone, (206) 254-4279 facsimile, and dericae@ehsintl.com e-mail.

1.5 APPLICABLE PUBLICATIONS

A. General Requirements: All work shall be done in compliance with the publications listed in this section as well as all Occupational Safety and Health Standards, the Uniform Building Code, Uniform Plumbing Code, Uniform Fire Code, the National Electrical Code, and as specified herein.

B. Title 29 CFR Part 1910 - General Occupational Safety and Health Standards

1. Subpart E. Means of Egress
2. Subpart I. Personal Protective Equipment
3. Subpart Z. Toxic and Hazardous Substances

C. Title 29 CFR Part 1926 - Safety and Health Regulations for Construction

1. Subpart C. General Safety and Health Provisions
2. Subpart D. Occupational Health and Environmental Controls
3. Subpart F. Fire Protection and Prevention
4. Subpart Z. Toxic and Hazardous Substances
5. Section 1926.1101 Asbestos

D. Title 40 CFR Part 61 - Environmental Protection Agency Hazardous Air Pollution

1. Subpart A. General Conditions
2. Subpart M. National Emission Standard for Asbestos

E. Title 40 CFR Part 763 - Environmental Protection Agency

1. Subpart E. Asbestos-Containing Materials in Schools
2. Subpart F. Friable Asbestos-Containing Materials in Schools
3. Subpart G. Asbestos Abatement Projects

F. Title 49 CFR 100-180 and 382 - Department of Transportation

G. Federal Standard 313B - Material Safety Data Sheets

H. American National Standard Institute (ANSI)

1. Z9.2-79 Local Exhaust Systems
2. Z87.1-89 Eye and Face Protection
3. Z88.2-80 Practices for Respiratory Protection

I. International Fire Code Institute

1. Uniform Fire Code (UFC) (2009 UFC Standards)

J. National Fire Protection Association (NFPA)

1. NFPA 701 (2010) Fire Tests for Flame-Resistant Textiles and Films

K. State of Washington Administrative Codes

1.	WAC 173-303	Dangerous Waste Regulations
2.	WAC 173-400	General Regulations for Air Pollution Sources
3.	WAC 296-62-077	Part I-1-Asbestos, Tremolite, Anthophilite, and Actinolite
4.	WAC 296-65	Safety Standards for Asbestos Removal and Encapsulation
5.	WAC 296-155	Safety Standards for Construction Work
6.	WAC 296-809	Confined Spaces
7.	WAC 296-841	Airborne Contaminants
8.	WAC 296-842	Respiratory Protection
9.	WAC 296-843	Hazardous Waste Operations and Emergency Response
10.	WAC 296-901	Hazard Communication, Global Harmonized System (GHS)

L. State of Washington Statutes

1.	RCW	40.17	Industrial Safety and Health Act
2.	RCW	70.105	Hazardous Waste Management Act

M. Puget Sound Clean Air Agency (PSCAA)

1. Regulation III, Article 4

1.6 QUALITY ASSURANCE

A. On-site Observation:

1. The safety and protection of the Contractor's employees, sub-contractor's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Hazardous Materials Consultant or representatives of local, State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall make two complete sets of clean, protective clothing and respirators available daily for such visitor use. It is the visitor’s responsibility to insure medical qualification, training, and current “fit test” prior to using any respirator provided by the contractor.
3. If the Hazardous Materials Consultant or agency visitor determines that practices are in violation of applicable regulations, or are endangering workers or the facility, they will immediately notify the Contractor orally that operations must cease until corrective action is taken. Such notification will be followed by written confirmation within three (3) work days.
4. Contractor shall stop work after receiving such oral notification. The work may not be restarted until the Contractor receives written authorization from the Hazardous Materials Consultant.
5. All costs resulting from such stop work order will be borne by the Contractor and will not be a basis for an increase in the contract amount or an extension of time.

B. Air Monitoring and Visual Inspections:

1. Monitoring employees for potential exposure to asbestos fibers as required by WAC 296-62-077.
2. Conduct personnel monitoring continuously during asbestos removal operations to determine the 8-hour time weighted exposure and 30-minute short term excursion limit exposure of workers to airborne fibers, as described in WAC 296-62-077.
3. The Hazardous Materials Consultant may perform air monitoring inside the building, inside the work areas, and on the Contractor's employees while asbestos work is underway. This additional monitoring does not reduce or replace the Contractor's required air monitoring.
4. Collect and have a certified laboratory analyze by phase contrast microscopy (PCM), using the NIOSH Analytical Procedure 7400, all air samples in accordance with WAC 296-62-077 and as specified herein.
5. The Contractor shall be responsible for all costs of cleaning, re-cleaning, re-inspection, and other costs required to meet final inspection requirements, including but not limited to laboratory fees, consultant fees and any premiums for accelerated "turn-around" times or overtime work required to meet approved schedules.
6. Direct asbestos laboratory, in writing on each Chain-of-Custody (CoC) form submitted for air sampling on this project, to forward by e-mail all project air monitoring results, and all other pertinent data and records, to the Owner's Asbestos Consultant. A sample of this written direction on a CoC form shall be submitted to the Owner along with the information required by Paragraph 1.13 (F).
7. Have asbestos laboratory archive all air samples until the successful completion of the project.
8. Perform pre-abatement PCM air monitoring in accordance with WAC 296-62-077, and as specified herein.
9. Perform PCM pre-clearance sampling, in accordance with WAC 296-62-077, and as specified herein.
10. The Owner's Hazardous Materials Consultant will perform PCM verification air clearance testing in all impacted areas in accordance with L&I DOSH phase contrast microscopy (PCM) method. Satisfactory verification visual and PCM air clearance monitoring, by the Owner's Hazardous Materials Consultant are required prior to removal of critical barriers and access of non-certified asbestos workers into the regulated areas.

C. The Contractor shall perform initial exposure assessments as required by WAC 296-62-077.

1.7 PROTECTION OF EXISTING WORK TO REMAIN: Perform asbestos removal in the project work areas without damage or contamination of adjacent work. Where existing work is damaged or contaminated, it shall be restored to its original condition at no expense to the Owner. The restorative procedures shall be approved by the Owner prior to start of restoration.

1.8 MEDICAL MONITORING AND DRUG TESTING

A. Institute a medical surveillance program for employees in accordance with WAC 296-62-077.

B. Provide random drug testing, as required by 49 CFR 382, for all drivers of vehicles transporting asbestos or hazardous materials.

1.9 TRAINING: Train and certify all workers who are required to remove, encapsulate, or barricade asbestos or to transport or dispose of asbestos as required by WAC 296-62-077, 40 CFR 763 and 49 CFR 382.

1.10 PERMITS AND NOTIFICATIONS: Make all required notifications for asbestos removal, hauling, and disposal as required by Federal, State, and local authorities.

1.11 SAFETY COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.12 RESPIRATOR PROGRAM: Establish a respirator program as required by WAC 296-62-077 and WAC 296-62-071.

1.13 INITIAL SUBMITTAL

A. Submit one bound or electronic, indexed copy with the following documentation to the Hazardous Materials Consultant for review, comments and approval, at least three work days prior to scheduled commencement of work. The Contractor is responsible for delays caused by late or incomplete submittals. Organize and index submittal packages in the order provided in the checklist 1.13.A.1 through 1.13.A.12. See Sub-sections 1.13.B through 1.13.M for detailed descriptions of individual submittal requirements. Submittals not properly organized and indexed will be rejected. Following submittal approval, provide the required number of copies of the approved submittal to the Architect as identified in the general conditions for all submittals.

1. Contractor's shop drawings
2. Contractor's work and compliance plan
3. Contractor's asbestos liability insurance policy
4. Contractor's schedule
5. Contractor's testing laboratory and laboratory personnel (including air sample analysis personnel)
6. Disposal site designations
7. Waste transporter designation
8. Manufacturer’s product data sheets and safety data sheets (SDS)
9. Contractor's representations
10. Contractor's notifications

    a. L&I DOSH
    b. PSCAA

11. Contractor's Asbestos Certifications
12. Contractor’s request for substitutions

B. Shop drawings shall show:

1. Provide shop drawings at each work area throughout the contract duration to show the layout of regulated area barriers and construction barriers;
2. Location of negative pressure enclosures, including personal decon, waste load-out, and negative pressure exhaust (if used);
3. Interior and exterior area air sample locations; and
4. Location of temporary site storage facilities.

C. The work plan shall include procedures for:

1. Methods: A description of all techniques, methods, and special equipment to be used during the contract, including methods fort typical abatement work required for this project. Include typical work procedures for each unit of work identified on the bid documents.
2. The work plan shall specifically address asbestos removal and disposal procedures as required by WAC 396-62-077 and 40 CFR 61.
3. The Work Plan shall be reviewed and certified as meeting Federal State, and local regulatory requirements and the requirements stated herein by an EPA-Certified Project Designer, prior to submittal. The Project Designer shall indicate his approval and certification by a signed cover letter attached to the work plan.

D. Insurance Policy: Submit copies of the Contractor's asbestos liability insurance policy, identifying South King County Fire & Rescue as additional insured. (Note: Policy must specifically identify coverage for asbestos and /or hazardous materials work.)

E. Schedule: Submit abatement schedule by work area.

F. Testing Laboratory and laboratory Personnel: Submit the name, location and phone number of proposed certified testing laboratory. Include legible, current copies of the laboratory's accreditation.

1. The Laboratory shall prove proficiency in the AIHA/NIOSH PAT Program and NVLAP program.
2. Provide a current AIHA PCM PAT Round results and NVLAP Certification for asbestos bulk analysis, if Contractor anticipates collecting and analyzing bulk samples.
3. Provide a copy of the Contractor's written direction to the Testing Laboratory requiring them to email copies of all Contractor air monitoring results, data sheets and chain-of-custodies for air monitoring samples to the Hazardous Materials Consultant within twenty-four (24) hours of receipt of the sample.

G. Disposal Site:

1. Identify the proposed Ecology/EPA permitted disposal site at which any waste material generated during the project will be disposed.
2. Furnish evidence of all necessary government approvals to dispose of the waste.

H. Waste Transporter: Submit the name and address of the proposed waste transporter.

I. Safety data sheets (SDSs): Submit legible copies of manufacturer's SDSs that describe product usage and restrictions, application procedures, and safety precautions. Submit copies of all SDSs for tape, plastic sheeting, solvents, encapsulants, adhesives, and lock-down chemicals.

J. Representations: Submit statement signed by a Principal of the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical examinations are accurate, up-to-date, and available for inspection.

K. Notifications: Submit a copy of all required notifications and permits obtained by the Contractor (L&I DOSH, and PSCAA). Submit upon receipt any approved amendments to notifications or re-notification for multi-phase activities:

1. L&I DOSH
   Regional Office
   950 Broadway #200
   Tacoma, WA, 98402

2. PSCAA
   1904 Third Avenue, Suite 105
   Seattle, WA 98101

L. Submit legible, current copies of the following Contractor certifications:

1. Current L&I asbestos abatement firm certification.
2. Asbestos Supervisor/Competent Person: Name, Asbestos Supervisor Certification, and resume of experience of the assigned onsite supervisor. At a minimum, the supervisor shall be certified in accordance with WAC Chapter 296-65-012.
3. Submit a legible copy of Certification for Contractor's AHERA Project Designer who reviewed and certified the Work Plan.

M. Substitutions: Submit proposals for substitutions of materials, equipment and methods to the Hazardous Materials Consultant at least seventy-two (72) hours prior to implementing the change.

1.14 PERIODIC SUBMITTALS

A. On the first day of mobilization, prior to commencing abatement, submit legible copies of the following asbestos certifications for the workers actually assigned to the project the day of mobilization:

1. Worker Certification: Current copies of L&I DOSH Asbestos Supervisor and Asbestos Worker Certifications for employees scheduled to work on the project in compliance with WAC Chapter 296-65-012.
2. Medical certification and respirator fit test: Submit a legible copy of the current asbestos medical certification and respirator fit test record (for each type of respirator to be worn) for each employee who will be working on the project.

B. Submit the following information obtained during the course of the work to the Hazardous Materials Consultant:

1. Initial Exposure Monitoring: Submit legible and completed results of the Contractor's initial exposure monitoring within two working days of sample collection.
2. Daily Air Monitoring: Have the Contractor's laboratory submit by email daily, to the Hazardous Materials Consultant, all results of Contractor's daily air monitoring. Submittal shall consist of legible and complete field data sheets and the analytical laboratory's results. Daily air monitoring submittals shall be furnished to the Hazardous Materials Consultant within 24 hours of collection of samples.
3. Project Daily Logs: Submit legible and completed copies of the previous day's Daily Logs.
4. Updated Project Information: Submit changes in project schedule or personnel at least 48 hours prior to the effective time of change for the following:

   a. Updated schedules for asbestos removal;
   b. Copies of the L&I DOSH, medical and fit test certificate for additional workers;
   c. Copies of amended notifications; and
   d. Copies of amended disposal authorizations.

1.15 FINAL SUBMITTAL

A. Submit three copies of the following documents with the application within 30 days of completion of asbestos removal work.

1. Employees' daily sign-in sheets;
2. Contractor's actual "Start and Finish" Project Dates;
3. Waste Shipment Records (40 CFR 61, Figure 4);
4. Disposal Site Receipts; and
5. Statement of completion of asbestos abatement work as required by these specifications and drawings.

1.16 SANITARY: The Contractor shall provide adequate toilet facilities

1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage by weather or vandalism.

1.18 ON-SITE DOCUMENTATION:

A. Maintain, on the job site, copies of the following data for safety, equipment, and supplies used for the work.

1. Equipment: Show the model, style, capacity, and the operation and maintenance procedures for the following, as applicable:

a. HEPA vacuum cleaners. schedules for asbestos removal and
b. Negative air machines.

2. Safety Data Sheets: Maintain a Safety Data Sheet (SDS) for each tape, plastic sheeting, solvent, encapsulant, adhesive, and lock-down chemical proposed to be used as required by WAC 296-62-054.

B. Respiratory Protection Plan: Maintain on-site their written respirator program. The Contractor's written and approved respirator program shall meet all requirements of WAC 296-62-077. Any deficiencies identified in the Hazardous Materials Consultant's review of the respiratory protection plan shall be corrected prior to commencement of work.

PART 2 - PRODUCTS

2.1 RESPIRATORS

A. Provide personally issued and marked respirators approved by NIOSH and MSHA, and provide sufficient replacement canisters for respirators with disposable filters.

B. Provided respirators with the protection factors required by WAC 296-62-077.

C. Respirators shall be suitable for dual ("stacked") cartridge use whenever both asbestos hazards and other respiratory hazards exist in the work area.

2.2 PROTECTIVE CLOTHING

A. Provide approved protective outer clothing, consisting of disposable fire retardant, full body coveralls and hoods fabricated from nonwoven fabric. Personal protective equipment shall be provided and utilized to meet applicable safety regulations.

B. Cloth work clothes may be worn under disposable protective coveralls, boots and gloves for comfort as permitted by regulation, however if worn in a negative pressure enclosure, the cloth clothing must be removed and left in the equipment room as personnel exit the enclosure and must be laundered by the employer per the applicable instructions.

2.3 SEALANTS AND ENCAPSULANTS: Penetrating and bridging encapsulants for asbestos applications. "Lock-Down" encapsulants used in non-finished areas shall be tinted for identification in a color, which will not obscure residual asbestos. Encapsulants shall be compatible with replacement materials and shall not contain hazardous materials listed in 29 CFR 1910, Subpart Z.

2.4 SURFACTANT: A surfactant consisting of 50% polyoxyethylene ether and 50% polyoxyethylene ester (or an approved alternate) shall be used, and shall be mixed with water at the rate of one ounce of surfactant to 5 gallons of water or as recommended by the manufacturer.

2.5 MASTIC REMOVAL SOLVENTS: Mastic removal solvents, if used, shall be non-flammable and shall not contain halogenated compounds. Solvents shall be compatible with replacement materials. Solvents must be of the “low odor” or “no odor” variety and so indicated on the SDS. Citrus based solvents do not meet these criteria. Delay of schedule for using these type solvents will not be acceptable.

2.6 PLASTIC SHEET: A minimum 6-mil thick flame resistant polyethylene (in accordance with NFPA 701) shall be used unless otherwise specified. The poly shall be sized in length and width to minimize the frequency of joints.

2.7 TAPE: Tape shall be capable of sealing joints of adjacent sheets of polyethylene, for attachment of polyethylene sheets to finished or unfinished surfaces and of adhering under both dry and wet conditions, including during use of amended water.

2.8 ADHESIVES: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene to finished or unfinished surfaces and of adhering under both dry and wet conditions.

2.9 DISPOSAL CONTAINERS: Disposal containers shall be suitable to receive, retain, and dispose of asbestos-containing or contaminated materials. Containers shall be labeled in accordance with the applicable regulations and must be both airtight and watertight. Plastic bags shall be a minimum 6-mil polyethylene, pre-printed with approved warning labels. Plastic wrap shall be 6-mil polyethylene sheets, securely wrapped and taped. Disposal containers shall be labeled with “ASBESTOS NA 2212,” Contractor’s name and location, and a Class 9 label.

2.10 EYE PROTECTION: The Contractor shall provide goggles to personnel engaged in asbestos operations, unless worker is required to wear a full facepiece respirator. Full facepiece respirators shall meet the requirements of WAC 296-62-077.

2.11 DANGER SIGNS AND LABELS: Danger signs and labels shall be affixed to all products or containers containing asbestos. The required signs shall be used to demarcate areas where asbestos waste is temporarily stored; and areas, not accessible to the public where asbestos-containing materials are left in place. Signs and labels shall be in accordance with applicable regulations and codes. The signs posted at work area entrance, exists, decontamination areas, and waste disposal areas shall comply with WAC 296-62-077, WAC 296-62-05411 and the UFC.

2.12 OTHER MATERIALS: The Contractor shall provide standard commercial quality of all other materials, which are required to prepare and complete the work.

2.13 TOOLS AND EQUIPMENT

A. Sprayers for amended water and encapsulant application shall be airless.

B. Vacuum cleaning equipment shall be manufactured for asbestos use and shall use HEPA filters on the discharge.

C. Scaffolding hoists and protective equipment shall meet all applicable safety regulations.

D. Transportation equipment shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. All trucks or vans used to transport asbestos shall be enclosed and sealed watertight. The driver of the truck shall have a commercial driver's license with hazardous material endorsement.

E. Provide all other tools and equipment for removal, enclosure, encapsulation, patching, and disposal activities.

F. Electrical tools and equipment shall meet all applicable codes and regulations.

PART 3 - EXECUTION

3.1 WORK AREAS

A. Regulated Work Areas: Establish regulated work areas in compliance with WAC 296-62-077.

B. Decontamination Area: Install decontamination areas in compliance with WAC 296-62-077. Decontamination areas shall meet fire exiting requirements of the UFC.

3.2 PERSONNEL PROTECTION PROCEDURES

A. Post the decontamination, safety, and work procedures to be followed by workers.

B. Provide continuous on-site supervision by the approved Certified Asbestos Supervisor.

C. Follow all worker protection procedures as described in the approved work plan.

D. Provide the highest level of respiratory protection unless approved and documented exposure assessments establish that a lower level of protection is adequate, as determined by the

Certified Asbestos Supervisor, with the written concurrence of the Hazardous Materials Consultant. For asbestos removal inside a negative pressure enclosure, respiratory protection shall be in accordance with the requirements of WAC 296-62-077, regardless of the exposure assessment.

E. Maintain a daily log of all workers and visitors entering regulated work areas. The log shall contain the name of each individual, his or her organization, accurate time of entering and leaving, and purpose of visit

F. Monitor worker exposure to airborne asbestos fibers as required by WAC 296-62-077

G. Provide approved filters for other airborne contaminants (solvents, etc.), which may be present. These filters shall be used in combination with approved asbestos filters. At no time shall the permissible exposure limit (PEL) for any airborne contaminant exceed the PEL listed in 29 CFR 1910, Subpart Z.

3.3 ASBESTOS REMOVAL PROCEDURES: Asbestos removal shall be in accordance with the Contractor's Approved Work Plan, applicable regulations, and this specification.

A. Fire exits and fire lanes shall not be blocked.

B. Work hours shall be as follow:

1. Work shall commence and complete in accordance with the contract documents.
2. Work hours shall be in accordance with the contract documents.

C. The Hazardous Materials Consultant must concur in writing with the proposed Work Plan, prior to commencement of work.

3.4 AIR MONITORING

A. Airborne concentrations of asbestos fibers shall be monitored in accordance with WAC 296-62-077, current EPA and OSHA guidance, and as specified herein. The Hazardous Materials Consultant may perform independent monitoring of the work area and Contractor’s employees. All monitoring shall be performed by trained industrial hygiene technicians or equivalent. All sampling pumps shall be calibrated in the field with a secondary calibration device before and after each sample. Built-in rotometers on pumps are not acceptable.

B. The Contractor shall accomplish pre-abatement sampling in accordance with WAC 296-62-07709(3)(g) and as specified herein.

1. The Contractor shall collect PCM pre-abatement air samples and submit them to his certified laboratory for analysis prior to commencement of any asbestos removal work.
2. The Contractor shall collect a minimum of three (3) pre-abatement samples per building.
3. Contractor’s L&I final visual inspection and pre-abatement samples in conjunction with pre-clearance PCM samples will be used as the basis for requests for the Owner’s Hazardous Materials Consultant to accomplish “3rd party” final visual inspections and air clearance sampling.
4. The Owner’s Hazardous Materials Consultant will not accomplish verification inspections and air clearance sampling until notified by the Contractor that L&I DOSH final visual inspection and pre-clearance PCM sampling have been completed satisfactorily. The Owner’s Hazardous Materials Consultant will accomplish verification visual inspections

and collect and have analyzed verification PCM air clearance samples. The results of the Owner's Hazardous Materials Consultant verification inspection and air sampling will be for the purpose of confirming compliance with contractual requirements, only.

C. The minimum number of daily samples per work area without a negative exposure assessment are as follows:

1. One (1) air sample within the regulated work areas.
2. One (1) air sample at least every other day, located outside the entrance to the work area.
3. Personnel samples (excluding excursion samples) shall be taken at least twice per eight-hour work shift at the rate of one sample for every six people performing that task in the same work area. Persons performing separate tasks or in separate work areas shall be sampled separately.
4. Excursion samples as required by WAC 296-62-077.
5. Two (2) waste load-out samples for the full duration of the operation, one taken inside the wash-down station and one taken on the clean side of the wash-down station. (No samples are necessary if no load-out operation is performed.).
6. All workers disturbing asbestos outside of a Negative Pressure Enclosure System shall be monitored continuously.
7. In addition to the samples listed in paragraphs 1 through 6 above, when employing a negative pressure enclosure, collect the following samples:

    a. Collect one (1) air sample every other day located at the entrance to the decontamination chamber.
    b. Collect one (1) air sample located at the exhaust(s) of the HEPA filtration unit(s) (if more than one unit is used, the sampling may be rotated between units, however, each unit must be sampled at least once every other day).
    c. Decontamination chamber entrance and HEPA exhaust samples are not required if negative pressure enclosures are not used.

D. Daily monitoring may be discontinued only after the Contractor's Certified Asbestos Supervisor certifies in writing that a Negative Exposure Assessment, in accordance with WAC 276-62-077, has been obtained. Written concurrence must be obtained from the Hazardous Materials Consultant prior to discontinuing daily monitoring.

3.5 DISPOSAL

A. Comply with current waste handling, storage, transportation, and disposal requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.

B. Label waste containers and vehicles in accordance with 40 CFR Part 61 and 49 CFR 100-180. Affix warning labels having waterproof print and permanent adhesive to all waste containers. Affix a Class 9 label with ID number 2212 on all four sides of the waste transport vehicle.

C. Waste transport vehicles shall be lined with polyethylene and be fully enclosed.

D. Waste shipping papers shall identify waste as "Asbestos 9, NA 2212 III, RQ" and list the total quantity being transported in addition to the requirements of 40 CFR 61.

E. Workers loading waste shall wear protective clothing and canister type respirators.

F. Materials containing <1% asbestos fibers may be disposed as normal construction debris.

G. Daily monitoring may be discontinued only after the Contractor's Certified Asbestos Supervisor certifies in writing that a Negative Exposure Assessment, in accordance with WAC 276-62-077, has been obtained. Written concurrence must be obtained from the Hazardous Materials Consultant prior to discontinuing daily monitoring.

3.6 CLEANING OF WORK AREA

A. Upon completion of asbestos repair or removal or of materials that contain <1% asbestos fibers within a work area, remove visible accumulations of asbestos material and debris. Wet clean and HEPA vacuum all work area surfaces.

B. Ensure that all asbestos-containing materials have been removed from concave corners and textured surfaces.

C. Notify the Hazardous Materials Consultant that asbestos work has been completed, that preliminary inspection has been accomplished by the Contractor, and that the work area is ready for final visual inspection. Include a statement that all asbestos in the work area has been removed, repaired, and/or encapsulated as required by the contract, and that all debris has been removed.

3.7 FINAL VISUAL INSPECTION AND AIR CLEARANCE MONITORING

A. The Owner's Hazardous Materials Consultant will conduct verification inspection and verification air monitoring in all impacted areas. The Owner's Hazardous Materials Consultant's verification air monitoring shall be conducted in accordance with NIOSH 7400 Method A. The asbestos sub-contractor's L&I DOSH phase contrast microscopy final air clearance monitoring will be used to clear all areas prior to inviting the Owner's Hazardous Materials Consultant to accomplish verification visual inspection or verification air sampling. The Owner's Hazardous Materials Consultant will use two-hour laboratory turn-around for all verification air monitoring.

B. Prior to admitting non-certified workers into areas regulated by WAC 296-62-077, the Contractor shall conduct a visual inspection to verify the completion of removal and clean-up and will conduct L&I DOSH pre-clearance air monitoring using phase contract microscopy (PCM). Airborne concentrations of asbestos fibers from the pre-clearance samples must be less than 0.01 fibers per cubic centimeter using PCM. Upon receipt of satisfactory air clearance results the Contractor will notify the Owner's Hazardous Materials Consultant that the work area is ready for verification visual inspection or verification air sampling. Re-entry of non-certified asbestos worker personnel will be dependent on the asbestos sub-contractor's final L&I DOSH visual inspection and phase contrast microscopy pre-clearance air monitoring and the Owner's Hazardous Materials Consultant's verification visual inspection and verification air monitoring.

C. Verification air monitoring tests will not be performed until all areas and materials within the work area are fully clean, encapsulated and dry. Allow 4 hours after encapsulation prior to start of final air clearance sampling to ensure encapsulate is fully dry.

D. EHSI will only collect one set of PCMs per building/per floor; the contractor should organize his work to support the PCM clearances.

E. If either/both of the Owner's Hazardous Materials Consultant's verification visual inspection or verification air monitoring results show that the work area has failed to meet the clearance criteria, the Owner's Hazardous Materials Consultant shall notify the Contractor. The Contractor shall re-clean the work area, accomplish an additional L&I DOSH final visual inspection and collect and analyze an additional set of L&I DOSH final PCM clearance air monitoring samples

whose asbestos concentration must be less than 0.01 fibers per cubic centimeter prior to requesting the Owner's Hazardous Materials Consultant accomplish another verification inspection and prior to collecting another set of verification air monitoring samples. All work specified in this paragraph shall be done at no additional expense to the Owner, including all labor and laboratory fees of the Owner.

F. Once the Contractor's final clearance air monitoring and the Owner's Hazardous Materials Consultant's verification visual inspection and verification air monitoring results meet the L&I DOSH PCM clearance criteria of WAC 296-62-077, for the work, then the HEPA filtration units may be deactivated (if applicable) and all seals, barriers, barricades, and decontamination areas shall be dismantled and removed, and the work area released to unprotected workers.

G. Work area containment's and/or critical barriers shall not be removed until final clearance results are reviewed and accepted by the Owner.

3.8 SUBSTANTIAL COMPLETION

A. After the work area barriers, plastic sheeting, decontamination area, etc., have been removed, the Contractor shall conduct an additional inspection to verify that there was no asbestos debris, contaminated water, or other residue, concealed by the work area protection installations. Any such residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.

B. After the Contractor certifies that the work area has been cleaned of all asbestos in compliance with the contract, the Contractor shall conduct a final inspection to verify that there is no unrepaired damage to walls, ceilings, doors or surfaces or finishes other than that called for by the scope of work. Costs of restoration of damaged finishes shall be borne by the Contractor.

END OF SECTION 028200

SECTION 028300 - LEAD-CONTAINING PAINT & MATERIALS DISTURBANCE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work for the Renovation Project requires the disturbance and disposal of materials coated with lead-containing paint (LCP) and other lead-containing building materials (LCM) from the Fire Station #66, located at 27010 15th Avenue S., Des Moines, Washington and shall be performed in accordance with the lead regulations and these specifications. These work activities are identified as shown on the drawings and as specified herein:

B. Interior and exterior paint surface and other LCM (e.g., ceramic tiles) tests using and X-ray fluorescence analyzer (XRF) measured lead at a variety of levels with results ranging from 8.4 milligrams per square centimeter (mg/cm2) to less than the detectable level. In addition, LCP and LCM bulk QA sample results were reported to contain lead concentrations ranging from 0.1700 percent lead by weight to less than the laboratory reporting limit. The lead sampling data is included in the Hazardous Material Survey Report which is provided as an appendix to the Summary of Hazardous Materials Summary of Work Section 011110 of these Specifications.

1. Based on the specified work scope that includes cutting, grinding, sanding, select demolition, paint chip cleanup, etc., the Contractor will as a minimum:

    a. Accomplish initial exposure assessments for each category of lead work (disturbance) in accordance with WAC 296-155-176.
    b. Accomplish dust control using wet methods or as required in accordance with WAC 296-155-176.
    c. Accomplish waste stream sampling as needed for hazardous lead concentrations in accordance with WAC 173-303.

2. Based on lead concentrations and the known scope of work, it is not expected that any lead work beyond that required by sub-paragraphs a, b, and c above, will be required. If initial exposure assessments or waste stream sampling require additional lead disturbance work, then the Contractor shall submit a change order with a Work Plan, in accordance with The Standard Form of Agreement, to the Owner for approval and work shall be accomplished in accordance with the approved Work Plan and as specified herein.
3. Pre-work submittals for work described in paragraphs 1.1.B.1-3, shall be in accordance with paragraph 1.11 of this Section. Provide the Owner's Hazardous Materials Consultant with copies of lead initial exposure assessment and waste stream sampling required by this Section, along with asbestos periodic submittals required by Section 028200.

C. Owner's Hazardous Materials Consultant: The Owner's Hazardous Materials Consultant is the firm/individual responsible for review and approval of Asbestos/Hazardous Materials submittals, for response to technical asbestos/hazardous materials removal questions, for monitoring of asbestos/hazardous materials work and for final visual inspection and final air clearance monitoring as specified herein. For this project, the Owner's Hazardous Materials Consultant is EHS-International, Inc., 1011 SW Klickitat Way Suite 104, Seattle, WA, (206) 381-1128 phone, (206) 254-4279 facsimile, dericae@ehsintl.com e-mail.

D. Fire Station #66 is not a "child occupied facility" or "target housing", as defined by the US Environmental Protection Agency (USEPA) Regulation 40 CFR 745 and the WA State

Department of Commerce (Commerce) Regulation WAC 365-230. Therefore, those regulations do not apply and it is not required that the Contractor subcontract a Renovation, Repair and Painting (RRP) Firm and it is not required that the work must be supervised by a Commerce RRP Certified Renovator. Lead safe work practices in accordance with the Commerce Regulation, though encouraged, are not required.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General conditions and Division-1 Specification sections, apply to this work.

B. Related Sections

1. 011110 Summary of Hazardous Materials Work
2. 028200 Asbestos Remediation Specification
3. Hazardous Materials Removal Drawings
4. Architectural, Electrical, and Mechanical Design and Demolition Drawings
5. Drawings and general provisions of the Contract, including Divisions 0 and 1 Specification Sections, apply to work of this section.

1.3 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations pertaining to lead removal and disposal are provided in the regulations, codes, and standards listed in Paragraph 1.4 of this Section.

A. Lead disturbance: For the purposes of this project, lead disturbance shall be defined as, demolition, asbestos abatement, renovation or other work that will disturb materials coated with paint containing measurable concentrations of lead or metallic lead materials, and that is not lead abatement.

1.4 APPLICABLE PUBLICATIONS

A. General Requirements

1. The publications listed below form a part of this specification to the extent referenced.
2. All work shall be performed in full compliance with the regulations listed in this section and the Uniform Building Code, Uniform Plumbing Code, Uniform Fire Code, Code of Federal Regulations (CFR) and the National Electrical Code, and as specified herein.

B. Title 29 CFR Part 1910 - General Occupational Safety and Health Standards

1.	Subpart E.	Means of Egress
2.	Subpart I.	Personal Protective Equipment
3.	Subpart Z.	Toxic and Hazardous Substances

C. Title 29 CFR Part 1926 - Safety and Health Regulations for Construction

1.	Subpart C.	General Safety and Health Provisions
2.	Subpart D.	Occupational Health and Environmental Controls
3.	29 CFR 1926.62	Lead
4.	Subpart F.	Fire Protection and Prevention
5.	Subpart Z.	Toxic and Hazardous Substances

D. Title 40 CFR - Environmental Protection Agency

1.	40 CFR 261	Identification and Listing of Hazardous Wastes
2.	40 CFR 260	Hazardous Waste Management System: General
3.	40 CFR 261	Identification and Listing of Hazardous Waste
4.	40 CFR 262	Standards Applicable to Generators of Hazardous Waste
5.	40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
6.	40 CFR 270	Hazardous Waste Permit Program
7.	40 CFR 745	Part II, Lead, Renovation, Repair and Painting Program

E. Title 49 CFR 100-180 and 382 - Department of Transportation

F. Washington State Department of Ecology (Ecology)

1.	WAC 173-303	Dangerous Waste Regulations

G. Washington State Department of Labor and Industries Division of Occupational Safety and Health (L&I DOSH)

1.	WAC 296-155	Safety Standards for Construction Work
2.	WAC 296-155-176	Lead
3.	WAC 296-800	Safety and Health Core Rules
4.	WAC 296-842	Respirators
5.	WAC 296-843	Hazardous Waste Operations and Emergency Response
6.	WAC 296-901	Hazard Communication, Globally Harmonized System (GHS)

H. Washington State Department of Commerce

1.	WAC 365-230	"…Lead Based Paint Activities"

I. Washington Statutes Revised Code of Washington (RCW)

1.	49.17 RCW	Washington Industrial Safety and Health Act
2.	70.105 RCW	Hazardous Waste Management Act

J. American National Standards Institute (ANSI)

1.	Z9.2	Local Exhaust Systems
2.	Z87.1	Eye and Face Protection
3.	Z88.2	Practices for Respiratory Protection (2015)

K. American Society for Testing and Materials (ASTM)

1.	D 4397	Polyethylene Sheeting

L. Federal Standards

1.	313B	Material Safety Data Sheets

M. International Fire Code Institute

1.	Uniform Fire Code	2003 UFC Standards

N. National Fire Protection Association (NFPA)

1. Fire Tests for Flame Resistant Textiles and Films

O. National Institute of Occupational Safety and Health (NIOSH)

1. Manual of Analytical Methods, 3rd Edition

P. Underwriters Laboratories (UL)

1. UL 586 High-Efficiency, Particulate, Air Filter Units

1.5 MEDICAL REQUIREMENTS

A. MEDICAL CERTIFICATION - Medical testing, evaluations, certifications, and record-keeping requirements shall conform to WAC 296-155-176.

B. DRIVER TESTING - Provide random drug testing, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

1.6 TRAINING

A. L&I DOSH TRAINING - Prior to commencement of work, each worker conducting lead disturbance work or handling lead wastes shall have successfully completed training in lead work as required by WAC-296-155-176. Training materials shall be available to all employees.

1.7 RESPIRATORY PROTECTION: The Contractor's Competent Person shall establish and implement a respiratory protection program in accordance with WAC 296-155-176.

A. RESPIRATORS - Respirators shall be supplied by the Contractor at no cost to the employees.

B. FIT TESTING - Respirator fit testing for each worker shall be conducted and administered at no cost to the employee.

1.8 HAZARD COMMUNICATION PROGRAM

A. The Contractor shall implement and maintain a hazard communication program in accordance with WAC 296-901.

1.9 SAFETY, HEALTH, AND ENVIRONMENTAL COMPLIANCE

A. The Contractor shall comply with all applicable safety, health, and environmental laws, ordinances, rules and regulations of federal, state, regional and local authorities.

1.10 PERMITS, LICENSES, NOTIFICATIONS, AND EPA IDENTIFICATION NUMBERS

A. FEES - The Contractor shall pay all fees for and obtain all necessary permits and licenses, required for lead storage, transportation and disposal. Timely notification shall be furnished as required by federal, state, regional and local authorities, and as specified herein.

B. EPA IDENTIFICATION NUMBER - The Contractor shall obtain the Owner's EPA Hazardous Waste Generator Identification Number from the Owner and shall use that number on all manifests for disposal of hazardous waste.

1.11 SUBMITTALS

A. INITIAL SUBMITTALS: The Contractor shall submit one (1) bound, indexed copy or an indexed electronic copy with the following documentation to the Owner for review and approval, at least three (3) working days prior to scheduled commencement of work. The Contractor is responsible for delays caused by late submittals. Submittal packages shall be organized and indexed in the order provided in the checklist 1.11.A.1 through 1.11.A.3.Submittals not properly organized and indexed will be rejected. Following submittal approval, provide the required number of copies of the approved submittal to the Architect as identified in the general conditions for all submittals. **It is the Contractor's responsibility to insure all subcontractors disturbing LCP/LCM are included in the Section 028300 pre-work submittals.**

1. Brief work plan identifying a general description of work practices, engineering controls, air monitoring, and decontamination involving lead-containing coatings. Include in the work plan the following:

    a. Name and qualifications of the proposed testing laboratory (to perform analysis of air and waste characterization samples);
    b. Procedures for personnel and equipment cleanup / decontamination;
    c. Lead waste management and disposal / recycling plan including: waste minimization efforts; container selection and labeling;
    d. Description of anticipated worker exposure assessment(s) for the project.

2. Competent Person: Provide the name, qualifications, and training certifications for the Contractor's full-time on-site supervisor shall be designated as, and shall be qualified to be, a "competent person" experienced in the administration and supervision of lead disturbance or abatement projects, as specified in WAC 296-155-176.
3. Employee Training and Certifications, submit the following;

    a. Documentation of lead awareness training in accordance with WAC 296-155-176 for each employee to be engaged in lead disturbance work or that will be potentially exposed to lead that shows the employee has been trained in lead exposure.
    b. Current respirator fit test for applicable respirator as determined by the Competent Person and certification of medical monitoring for respirator use.

B. PERIODIC SUBMITTALS

1. Schedule Changes - Submit changes in project schedule or personnel at least 48 hours prior to the effective time of change. Note: For schedule changes the Contractor shall provide an updated signed acknowledgement form.
2. Work Plan Changes - Submit updated documentation for any submittal requirements that may have changed, reached expiration, and/or cancellation during the course of the project.
3. Personnel Air Monitoring Results - Have Contractor's Certified Lab submit by e-mail/facsimile within 24 hours of receipt of sample analytical results of initial and periodic personnel air sampling.
4. Toxicity Characteristic Leachate Procedure for Waste Stream Characterization - Provide TCLP analytical results for each construction debris waste stream, prior to disposal of

any potentially lead-paint contaminated waste as other than “Hazardous Waste,” showing the leachable lead content is less than the Washington State Department of Ecology threshold for disposal as “dangerous waste.”

C. FINAL SUBMITTALS: The Contractor shall submit the following documents to the Owner’s Hazardous Materials Consultant within thirty (30) days of completion of abatement work:

1. Project daily logs - Provide Contractor’s daily logs for all “lead-paint” work, including identification of work area, individuals accomplishing “lead-paint” work, personal protective equipment, work practices, and engineering controls used to control exposure, and start and completion times for work.
2. Project “Start and Finish” dates.
3. Air Monitoring - Provide signed air monitoring data sheets and laboratory reports.
4. Waste Shipment Records - Provide lead hazardous waste shipment records (Manifest EPA form 8700-22) if required.
5. Disposal site receipts (if required).
6. Material delivery receipts for any metallic lead recycling receipts or for recycled materials coated with lead-containing paint.

1.12 QUALITY ASSURANCE

A. On-site observation

1. The safety and protection of the contractor’s employees, sub-contractor’s employees, owner’s employees, the facility, and the public is the sole responsibility of the contractor.
2. The owner’s hazardous materials consultant or representatives of local, state or federal agencies may make unannounced visits to the site during the work. The contractor shall make two complete sets of clean, protective clothing and respirators available for such visitor use. It is the visitor’s responsibility to ensure medical qualification, training, and current “fit test” prior to using any respirator provided by the contractor.
3. If the owner’s hazardous materials consultant or agency visitor determines that practices are in violation of applicable regulations, or are endangering workers or the facility, they will immediately notify the contractor orally that operations must cease until corrective action is taken. Such notification will be followed by written confirmation within three (3) workdays.
4. Contractor shall stop work after receiving such notification. The work may not be restarted until the contractor receives written authorization from the owner’s hazardous materials consultant.
5. All costs resulting from such stop work order will be borne by the contractor and will not be a basis for an increase in the contract amount or an extension of time.

1.13 LEAD DISTURBANCE WORK: For work involving lead disturbance only, the contractor shall comply with the following requirements:

A. Work Plan: The Contractor shall provide a “brief” Work Plan that identifies respiratory protection, engineering controls and work practices that will be followed until a negative exposure assessment can be produced and that will identify a plan for demolition debris waste stream sampling and characterization.

B. Training: Prior to commencement of work, each worker conducting lead disturbance work or handling lead wastes shall have successfully completed training as required by WAC-296-155-176.

C. Exposure Assessment: Prior to commencement of work, the Contractor shall accomplish an exposure assessment, based on the known scope of work, the concentration of lead in painted materials, and previous similar work. Note: If the Contractor is using air monitoring data from previous work sites for a negative exposure assessment, that data must be provided to, reviewed by, and concurred with by the Owner's Hazardous Materials Consultant prior to reducing or eliminating respiratory protection for workers disturbing material with measurable lead concentration in the paint coating and/or other LCM.

1. Exposure assessment shall be for the lead action level and shall be based on personal air monitoring accomplished by the Contractor of employees within the previous 12 months.
2. The previous air monitoring and sample analysis shall have been accomplished in accordance with the L&I DOSH lead standard and the data obtained shall be for work operations conducted under work place conditions "closely resembling" the processes, types of materials impacted, lead concentration in the paint, the condition of the paint, control methods used, and environmental conditions that are similar to those for the current project.
3. If a negative exposure assessment is not possible based on previous air monitoring, then the Contractor shall as a minimum.

    a. Provide appropriate respiratory protection to employees accomplishing the lead disturbance work.
    b. Accomplish initial air monitoring to determine the employee exposure.
    c. Obtain the concurrence of the Owner's Hazardous Materials Consultant prior to determining that there is a negative exposure assessment and before downgrading or eliminating respiratory protection and decontamination requirements.
    d. In the absence of a negative exposure assessment, the Contractor shall comply with the requirements of worker protection and decontamination as specified in the L&I DOSH lead standard.

4. Waste stream testing for lead contamination.

    a. Prior to disposal of any demolition debris, the Contractor shall accomplish waste stream testing for leachable lead contamination.
    b. Testing shall be in accordance with Ecology Dangerous Waste Regulation, WAC 173-303, and shall comply with the U.S. Environmental Protection Agency Method No. 1311 for Toxic Characteristic Leaching Procedure (TCLP).
    c. TCLP results must be less than 5.0 milligrams per liter of leachate (mg/l) for disposal of the debris as non-lead contaminated dangerous waste.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT

A. RESPIRATORS - Respirators shall be selected and used in accordance with the manufacturer's recommendations, and shall be approved by NIOSH and MSHA for use in environments containing airborne lead. Approved respirators shall protect the worker as described in the Contractor's Respiratory Protection Plan. The Contractor shall provide approved respirators, personally issued to and marked for each individual worker. The Contractor shall also provide approved replacement filter canisters, for those types of respirators that utilize disposable filters.

B. PROTECTIVE CLOTHING - Personnel potentially exposed to lead dust or fumes above the PEL shall be provided with disposable whole-body protection as specified herein and such

protection shall be worn properly. The Contractor shall provide personal protective equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION

A. WASH STATION - For work that disturbs lead-containing paint, the contractor shall supply a wash station, as a minimum.

2.3 WARNING SIGNS AND TAPE

A. Warning signs and tape shall be posted at the boundaries and entrances to lead disturbance and abatement work areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign. Warning signs and tape shall conform to the requirements of WAC 296-155-176.

2.4 WARNING LABELS

A. Warning labels shall be affixed to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Labeling shall conform to WAC 296-155-176 and 49 CFR 100-180.

2.5 TOOLS

A. Vacuum cleaners shall be equipped with HEPA filters. Power tools to remove lead-containing material shall have been approved for use by the Owner’s Hazardous Materials Consultant. Open-flame and electric element heat-gun type tools with temperatures in excess of 700° F shall not be used to remove lead-containing material. All residual lead contamination shall be removed from reusable tools being removed from lead disturbance or abatement work areas. Electrical tools and equipment shall be UL listed.

2.6 EXPENDABLE SUPPLIES

A. Flame resistant 6-mil thick polyethylene sheet plastic (in accordance with NFPA 701) shall be provided in widths necessary to minimize seams.

2.7 Safety Data Sheets **(**SDSs**)**

A. SDSs shall be provided for all chemical materials brought onto the work-site.

2.8 OTHER ITEMS

A. Other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, shall be provided in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.

2.9 ENCAPSULANTS

A. Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied.

PART 3 - EXECUTION

3.1 GENERAL**:** Lead disturbance work shall be performed in accordance with the Contractor's approved work plan, applicable regulations and this specification.

3.2 WORK STOPPAGE

A. The Contractor shall stop work when the Owner's Hazardous Materials Consultant, or a representative of a regulatory agency, determines that the work is not in compliance with the Contractor's approved work plan, these specifications, and applicable laws and regulations. The Contractor shall stop work and notify the Owner's Hazardous Materials Consultant whenever the measured concentrations of lead outside the work area equal 30 $\mu g/m^3$ for airborne lead (or the pre-work background levels, whichever is higher). When such work stoppage occurs, the cause of the contamination shall be corrected and the damaged or contaminated area shall be restored to its original decontaminated condition by the Contractor at no expense to the Owner.

3.3 FURNISHINGS: The Owner will remove all furniture and equipment from the area before lead disturbance work begins.

3.4 BUILDING VENTILATION SYSTEM

A. Building ventilation systems supplying air into or returning air from lead work areas shall be shut down and isolated by airtight seals.

3.5 BUILDING ELECTRICAL SYSTEMS

A. A Certified Electrical Contractor shall de-energize, "lock-out," and "tag-out" electrical service where necessary, and the Contractor's Competent Person shall verify the "lock-out," "tag-out," prior to commencing any wet washing and/or wet removal work. Temporary electrical service, equipped with ground fault circuit interrupter (GFCI) protection, shall be provided where needed.

3.6 INITIAL DETERMINATION**:** (Note: An initial determination is required in the absence of acceptable prior exposure data.)

A. The Contractor shall establish an initial work area for each material to be disturbed and each disturbance procedure.

B. These work areas shall be isolated from the rest of the building. Personnel working in these areas shall wear respiratory protection and personal protective equipment as directed by the Competent Person.

C. Personal and work area air monitoring shall be performed as directed by the Competent Person. Operational decontamination facilities shall be available.

D. Work performed shall be representative of the work to be done during the remainder of the project.

3.7 RESPIRATOR EVALUATION

A. Upgrading, downgrading, or not requiring respirators shall be recommended by the Contractor's Competent Person based on the measured airborne lead-containing dust concentrations and must be approved by the Hazardous Materials Consultant.

B. If the Contractor's Competent Person determines that it is necessary to upgrade the respiratory protection, based on the measured airborne lead-containing dust concentrations, the upgrade shall be implemented immediately, followed by notification to the Owner's Hazardous Materials Consultant.

C. Recommendations to downgrade respirator type or not require respirators shall be submitted in writing to the Owner's Hazardous Materials Consultant for review and written approval prior to implementation.

3.8 DISTURBANCE AND REMOVAL METHODS

A. Lead disturbance and removal shall be done as described in the Contractor's approved work plan and in accordance with applicable regulations.

1. Fire exits shall not be blocked.
2. The Hazardous Materials Consultant must concur in writing with the proposed Work Plan, prior to commencement of work.

3.9 SAMPLING OF WASTE MATERIALS

A. Project wastes shall be tested prior to transport and disposal as required by WAC 173-303.

3.10 HAZARDOUS WASTE DISPOSAL

A. Hazardous project wastes shall be disposed of as required by WAC 173-303 and the Contractor's approved work plan.

3.11 CONSTRUCTION (NON-HAZARDOUS) WASTE DISPOSAL

A. Dispose of solid (non-hazardous) waste, as determined by testing, as ordinary construction waste in accordance with the applicable federal, state, and local laws and regulations.

B. Burning of waste is prohibited.

3.12 SALVAGEABLE MATERIALS

A. The Contractor may salvage metallic lead and other materials to keep such materials from entering the project waste stream.

B. Such salvage shall be sold or transferred accompanied by a document of exempt status, in accordance with 40 CFR 261.

END OF SECTION 028300

SECTION 028500 – PCB & Hg REMEDIATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work requires the disturbance and removal and disposal of polychlorinated biphenyls (PCB)-containing light ballasts and the recycling of Hg-containing fluorescent light tubes, HID lamps, CFL bulbs, thermostats from Fire Station #66, located at 27010 15th Avenue S., Des Moines, Washington; as shown on the drawings and as specified herein, prior to renovation of the building on the facility site.

B. General: Use HAZARDOUS MATERIALS SUMMARY provided in project drawings for Base Bid Quantities of Hazardous Materials.

1.2 WORK SPECIFIED ELSEWHERE

A. 011110 Summary of Hazardous Materials Work Report

B. 028200 Asbestos Remediation Specification

C. 028300 Lead-Containing Paint Disturbance Specification

D. Hazardous Materials Removal Drawings

E. Architectural, Electrical, Plumbing, Structural and Mechanical Design and Demolition Drawings

1.3 GENERAL REQUIREMENTS

A. PCB-CONTAINING LIGHT BALLASTS AND MERCURY-CONTAINING LIGHT TUBES, LAMPS, BULBS, AND THERMOSTATS: These Technical Specifications pertain to the handling of PCB-containing light ballasts and mercury-containing light tubes, HID lamps, CFL bulbs, and thermostats.

B. HAZARDOUS MATERIALS: Hazardous materials shall mean all toxic and hazardous substances listed in 29 CFR 1910 Subpart Z.

C. WASHINGTON STATE DANGEROUS WASTE: Washington State Dangerous Waste shall refer to those hazardous materials that are not covered by the USEPA Hazardous Waste Regulations, but are still considered under Washington State Regulations as hazardous and requiring special handling and disposal. These materials shall be segregated from the USEPA Hazardous Waste ballasts and shall be separately packaged, manifested, and disposed in accordance with WAC 173-303.

D. HAZARDOUS MATERIALS ABATEMENT WORK: The requirements contained in this Section pertain to HAZARDOUS MATERIALS ABATEMENT WORK and are for the purpose of protecting personnel against exposure to hazardous substances.

E. SAFETY AND PROTECTION: The safety and protection of the Contractor's employees, sub-contractor's employees, the facility, and the public is the sole responsibility of the Contractor.

F. OWNER'S HAZARDOUS MATERIALS CONSULTANT: The Owner's Hazardous Materials Consultant is the firm/individual responsible for review and approval of Asbestos/Hazardous Materials submittals, for response technical response to asbestos/hazardous materials removal questions, for monitoring of asbestos/hazardous materials work and for final visual inspection and final air clearance monitoring as specified herein. For this project, the Hazardous Materials Consultant is EHS-International, Inc., 1011 SW Klickitat Way, Suite 104, Seattle, WA, (206) 381-1128 phone, (206) 254-4279 facsimile, dericae@ehsintl.com e-mail.

G. REGULATIONS: All work is required to comply with the following regulations

1. Title 40 Code of Federal Regulations (CFR): Environmental Protection Agency

a.	40 CFR 260	Hazardous Waste Management System: General
b.	40 CFR 261	Identification and Listing of Hazardous Waste
c.	40 CFR 262	Standards Applicable to Generators of Hazardous Waste
d.	40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
e.	40 CFR 270	EPA Administered Permit Programs: the Hazardous Waste Permit Program
f.	40 CFR 761	PCBs, Manufacturing, Processing, Distribution in Commerce, & Use Prohibitions

2. Title 49 CFR: Department of Transportation Regulations: 49 CFR 100-180 & 382

3. Washington Administrative Codes (WAC):

a.	WAC 173-303	Dangerous Waste Regulations
b.	WAC 296-155	Safety Standards for Construction Work
c.	WAC 296-843	Hazardous Waste Operations
d.	WAC 296-901	Hazard Communication, Globally Harmonized System (GHS)

4. Washington State Statutes Revised Code of Washington (RCW)

a.	49.17 RCW	Washington Industrial Safety and Health Act
b.	70.105 RCW	Hazardous Waste Management Act

5. American National Standards Institute (ANSI)

a.	Z9.2	Local Exhaust Systems
b.	Z87.1	Eye and Face Protection
c.	Z88.2	(2015) Practices for Respiratory Protection

6. American Society for Testing and Materials (ASTM)

a.	D 4397	Polyethylene Sheeting

7. Federal Standards

a.	313B	Material Safety Data Sheets

8. International Fire Code Institute

a.	Uniform Fire Code	2009 UFC Standards

9. National Fire Protection Association (NFPA)

a. Fire Tests for Flame Resistant Textiles and Films

10. National Institute of Occupational Safety and Health (NIOSH)

a. 1984 Manual of Analytical Methods, 3rd Edition

1.4 MEDICAL REQUIREMENTS

A. Provide random drug testing, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

1.5 INITIAL SUBMITTAL

A. Pre-Work Submittal Documentation: Submit one (1) indexed, bound or electronic copy of the following “pre-work” submittal, in accordance with contract submittal requirements, for review and approval, at least three (3) working days prior to scheduled commencement of work. The Contractor is responsible for delays caused by late submittals. Submittal packages shall be organized and indexed in the order provided in the checklist 1.5.A.1 through 1.5.A.4. See Sub-sections 1.5.B through 1.5.E for detailed descriptions of individual submittal requirements. Submittals not properly organized and indexed will be rejected. Following submittal approval, provide the required number of copies of the approved submittal to the Architect as identified in the general conditions for all submittals:

1. Competent Person knowledgeable in PCBs
2. PCB Ballast and Hg-containing Light Tube, HID Lamps, CFL Bulbs, and Thermostats Work Plan.
3. Hazardous Waste Disposal Plan.
4. Hazardous Waste ID Number.

B. Competent Person knowledgeable in PCBs

1. Provide the name and qualifications for the Contractor’s full-tile on-site supervisor. The individual must be a “competent person” experienced in the administration and supervision of PCB disturbance or abatement projects, as specified in 40 CFR 761.

C. PCB Ballast and Hg-containing Light Tube, HID Lamps, CFL Bulbs, and Thermostats Work Plan: Submit a detailed written work plan of the procedures proposed for use in complying with the following information.

1. The Work Plan shall be prepared in the form of checklists and shall include specific procedures for:

a. Ballast removal procedure, including identification and separation of “leakers” and “non-leakers.”
b. Fluorescent light tube HID lamps, CFL bulbs, and thermostats removal and packaging for shipment to recycler.
c. Work area preparation and protection procedures.
d. Worker protection and decontamination procedures, including normal removal and “spill” response.
e. Waste handling, packaging, labeling, and manifesting procedures.
f. The Work Plan shall contain sufficient detail so that a skilled worker, by following the Plan, can perform acceptable work in a safe manner to remove PCB-

containing electrical equipment, both “leakers” and “non-leakers”, as well as, mercury-containing light tubes, HID lamps, CFL bulbs, and thermostats.

2. Safety Data Sheets (SDSs): The Contractor shall maintain on-site SDSs for each solvent and degreaser proposed to be used.

D. Hazardous Waste Disposal Plan: Submit a written Hazardous Waste Disposal Plan with the following information:

1. The name, address, operator's name, and phone number of his proposed Solid Waste Disposal Facility and of his proposed Hazardous Waste Disposal Facility and Mercury Tube/Lamp Recycling Facility.
2. Written evidence that the proposed Waste Disposal/Recycling Facilities are approved and permitted for solid and/or hazardous waste disposal by the Environmental Protection Agency (EPA), state, and local regulatory agencies.
3. Waste Carrier and Disposal Site Designation: The Contractor shall submit the name, address, and qualifications of his/her proposed waste transporter. The Contractor shall designate the EPA-approved disposal site to which he/she proposes to ship the hazardous materials.

E. Hazardous Waste Identification Number: The Contractor shall submit the Owner’s USEPA Hazardous Waste Generator identification number for the purpose of accumulating hazardous waste in accordance with 40 CFR 262 and an USEPA identification number for transporting hazardous waste, or documentation from the waste transporter and disposal site indicating the waste generator identification number is not required.

1.6 FINAL SUBMITTAL

A. The Contractor shall submit three copies of the following documents within thirty (30) days of completion of abatement work

1. A list of all employees who worked on the project, daily sign-in sheets, and copies of their current certification (if not previously submitted).
2. Contractor's actual "start and finish" project dates.
3. All hazardous waste shipping manifests for PCB-containing light ballast, and Hg-containing light tubes, HID lamps, CFL bulbs, and Thermostats.

PART 2 - PRODUCTS

2.1 PROTECTIVE CLOTHING

A. The Contractor shall provide approved aprons, gloves, goggles, face shields, and hard-hats for all workers engaged in mercury-containing materials removal.

PART 3 - EXECUTION

3.1 PREPARATION

A. ELECTRICAL POWER: The Contractor shall verify that the electrical power to the affected components is deactivated, disconnected, and locked-out.

B. LOADED DISPOSAL DRUMS: The Contractor shall provide handling equipment to move disposal drums/recycling containers loaded with discarded mercury-containing waste.

C. DECONTAMINATION PROCEDURES: All personnel involved with handling and recycling of mercury-containing light tubes will comply with the following decontamination procedures:

1. Establish a change area where personnel will don or remove personal protection equipment (PPE).
2. The workers will utilize assembly-line decontamination stations where used equipment/gear will be removed and stored in approved drums or storage containers.
3. PPE materials shall be removed and placed in approved disposal containers.
4. The workers will proceed through decontamination stations and thoroughly clean their hands and exposed surfaces with soap and rinse with clean water.
5. All rinsates from the decontamination procedures will be stored in approved containers and properly disposed.

D. WASH-DOWN STATION: A wash-down station will be provided with "full person" capabilities for decontamination in a spill response.

E. SCHEDULE: The Contractor shall develop and provide the Hazardous Materials Consultant with a work schedule including, mobilization, identification of planned work areas, and start and completion dates, and shall update the schedule for any changes.

3.2 WORKER PROTECTION

A. APPROVED WORK PLAN PROCEDURES:

1. All personnel entering the work area shall sign the daily log and put on clean protective clothing.
2. Basic protective clothing shall consist of aprons, gloves, goggles, face shields, and hard hats--with the addition of approved full body coveralls, bib-type aprons, and respirators as conditions warrant.
3. A contaminated material disposal drum, 6 mil. plastic wrapping and tape, or appropriate bagging materials shall be available for leaking ballasts and/or oil-contaminated components.

3.3 REMOVAL OF NON-LEAKING PCB-CONTAINING MATERIAL (“NON-LEAKERS”)

A. The Contractor shall ensure that workers performing the tasks below are wearing approved aprons, gloves, goggles, face shields, and hard hats.

B. NOTE: If any oily residue is seen on any component of the fixture, the worker shall stop work on that fixture; conspicuously mark the fixture with paint to identify a suspected leaking ballast; and go on to the next fixture.

1. The worker shall remove diffusers, tubes and wiring harness covers from each fixture to expose the ballast.
2. The worker shall cut the wires connected to the ballast; remove the fasteners attaching the ballast to the fixture; and deposit the ballast in an approved disposal drum.

3.4 REMOVAL OF LEAKING PCB-CONTAINING MATERIAL (“LEAKERS”)

A. The Contractor shall ensure that workers performing the tasks below are protected with approved, full body coveralls, bib-type aprons, respirators with goggles, and face shields, respirators with organic vapor cartridge, aprons, gloves, and boots. Six (6) mil plastic sheets shall be placed on the floor to prevent an oil spill from contaminating the floor material.

B. Removal Procedures:

1. All components of the PCB-contaminated equipment shall be wrapped in 6 mil plastic and placed in the disposal drum.
2. All oily residues shall be cleaned up using the approved solvent or detergent.
3. Should any oily residues have fallen on the plastic sheeting on the floor, the worker shall decontaminate themselves and their PPE prior to stepping off of the contaminated plastic sheeting.
4. Cleaning rags, used plastic sheets, and cleaning solvents shall be disposed of as PCB contaminated material

3.5 REMOVAL AND RECYCLING OF MERCURY-CONTAINING LIGHT TUBES, HID LAMPS, CFL BULBS, AND THERMOSTATS

A. REMOVAL PROCEDURES: Light tubes, HID lamps, CFL bulbs, and thermostats shall be removed in a manner to prevent breakage. If a tube, lamp, bulb, or thermostat breaks immediately clean-up debris and place in a box specified for broken tubes. Broken tubes, lamps, bulbs and/or thermostats shall also be recycled but must be separated from unbroken tubes.

B. TUBE CLEANUP:

1. Tubes, lamps, bulbs and/or thermostats shall be “wet wiped” using a damp cloth and dried prior to placing in boxes.

C. PACKAGING:

1. Tubes, lamps, bulbs and/or thermostats shall be placed in boxes with corrugated cardboard or Styrofoam dividers in a manner to prevent breakage. Tubes shall not be taped together.

D. RECYCLING:

1. Boxes of light tubes shall be labeled in accordance with DOT requirements and shall be transported by the approved transporter to the approved recycling facility in accordance with DOT regulations.

E. CLEAN-UP PROCEDURES FOR BROKEN FLUORESCENT LIGHT TUBES, HID LAMPS, CFL BULBS, AND THERMOSTATS:

1. Contractor shall have cleanup kit on site prior to removing/dismantling fluorescent light fixtures.
2. Broken tubes, lamps, bulbs and/or thermostats shall be cleaned-up immediately.
3. Use calcium polysulfide wetting solution on spilled lamp material to inhibit vaporization.
4. Following removal of broken glass, clean the floor with diluted trisodium phosphate solution according to manufacturer’s recommendations.
5. Identify, seal, and mark all containers with broken tubes, lamps, bulbs and/or thermostats for special handling.
6. Mark and seal all drums of collected phosphate powder.

3.6 HAZARDOUS WASTE DISPOSAL

A. Hazardous project wastes shall be disposed of as required by WAC 173-303 and the Contractor's approved disposal plan.

3.7 CONSTRUCTION (NON-HAZARDOUS) WASTE DISPOSAL

A. The Contractor shall dispose of solid (non-hazardous) waste, as determined by testing, as ordinary construction waste in accordance with the applicable federal, state, and local laws and regulations. Burning of waste is prohibited.

3.8 SALVAGEABLE MATERIALS

A. The Contractor may salvage non-hazardous materials to keep such materials from entering the project waste stream. Such salvage shall be sold or transferred accompanied by a document of exempt status, in accordance with WAC 173-303.

END OF SECTION 028500