SECTION 02 8100
ENVIRONMENTAL CONDITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section. Sections that address the mitigation, abatement or management of hazardous building materials (HBM) include:

02 8200	Asbestos Containing Materials
02 8300	Lead Containing Materials
02 8400	Lighting and Electrical Components
02 8500	Refrigerant Containing Systems

1.02 SUMMARY

A. Asbestos containing materials (ACM) present in the ELC building include thermal system pipe insulation and insulated joints, elbows, and tees (JETs); surfacing wall texture and ceiling texture; black roof sealant; built-up roofing; nine-inch square vinyl floor tile; and window units with window glazing. Additionally, less than one percent (<1%) asbestos containing items that will be impacted by renovation shall be abated concurrent with ACM and include 12-inch vinyl tile; adhesive associated with nine-inch and 12-inch vinyl tile; and gray window glazing associated with basement windows. Contractor shall refer to Section 02 8200 for minimum work practices. Only those ACM that will be impacted by the renovation will be abated.

B. Lead containing materials (LCM) are present on metal, plaster, wood, and concrete substrates. Additionally glazed tile, wall block, metal pipe caps, plumbing components, roof jacks, solder and brazed components are assumed to be LCM. Impact to these materials during the work will be managed concurrent with renovation. Contactor shall refer to section 02 8300 for minimum work practices.

C. Lighting and electrical components (LEC) consist of four-foot fluorescent and light-emitting diode (LED) lamps; compact fluorescent lamps (CFL); and magnetic ballasts assumed to contain polychlorinated biphenyl (PCB) or other hazardous constituents. The treatment of lighting components varies from space to space and includes complete removal, reuse, relocation and no impact. Refer to the electrical drawing sheets for lighting impact by area. Contactor shall refer to section 02 8400 for minimum work practices.

D. Refrigerant containing systems (RCS) are present and include refrigerators (domestic-type) and mini-refrigerators; components in the building heating, ventilation, and air conditioning system; window mounted air conditioners; and chilled drinking fountains. Only those components that will be impacted by the renovation shall be decommissioned or removed for recycling prior to renovation. Contactor shall refer to section 02 8500 for minimum work practices.

1.03 DOCUMENTS FOR REFERENCE

A. Refer to the following documents of detailed identified hazardous building materials within each building prepared by Fulcrum Environmental Consulting, Inc. (Fulcrum):
   1. *Hazardous Building Materials Inspection Report*, *Inlow Hall One University Boulevard, Le Grande, Oregon*, Fulcrum project 223507.00, dated June 16, 2022.
   2. *Supplemental Asbestos Containing Materials Inspection Trustee's Board Room – Inlow Hall, Eastern Oregon University Campus,* dated September 23, 2022.

B. Copies of this report is at the following locations:
   1. Eastern Oregon University, One University Boulevard, La Grande, Oregon
   2. Fulcrum Environmental Consulting, Inc., 406 North Second Street, Yakima, Washington

C. Refer to Figures 02 8100-1, 02 8100-2, 02 8100-3, and 02 8100-4 located at the end of this section for a general representation of HBM locations.

D. Contractor shall review the work and be responsible for providing a safe work environment for their employees, subcontractors, and site visitors on this multi-employer project.

PART 2 - PRODUCTS

A. NOT USED

PART 3 - EXECUTION

A. NOT USED

END OF SECTION 028100

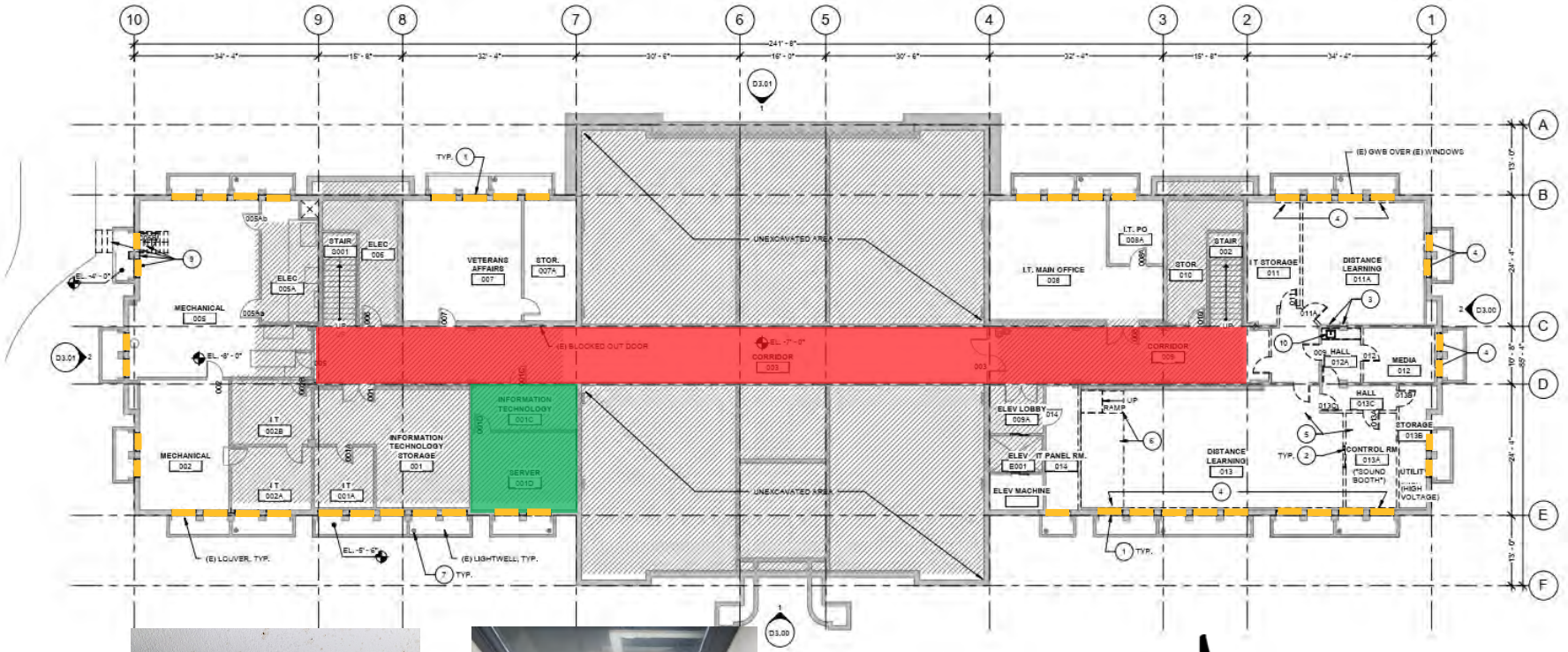
- ACM vinyl floor tile

- Window units with ACM window glazing

- ACM smooth plaster patch along pipe hanger penetrations

ACM thermal system insulation present throughout the basement

Not all ACM will be abated refer to Section 02 8200 for abatement scope



ACM plaster ceiling patch along pipe hanger penetrations in corridor

ACM window glazing on the exterior windows of the basement

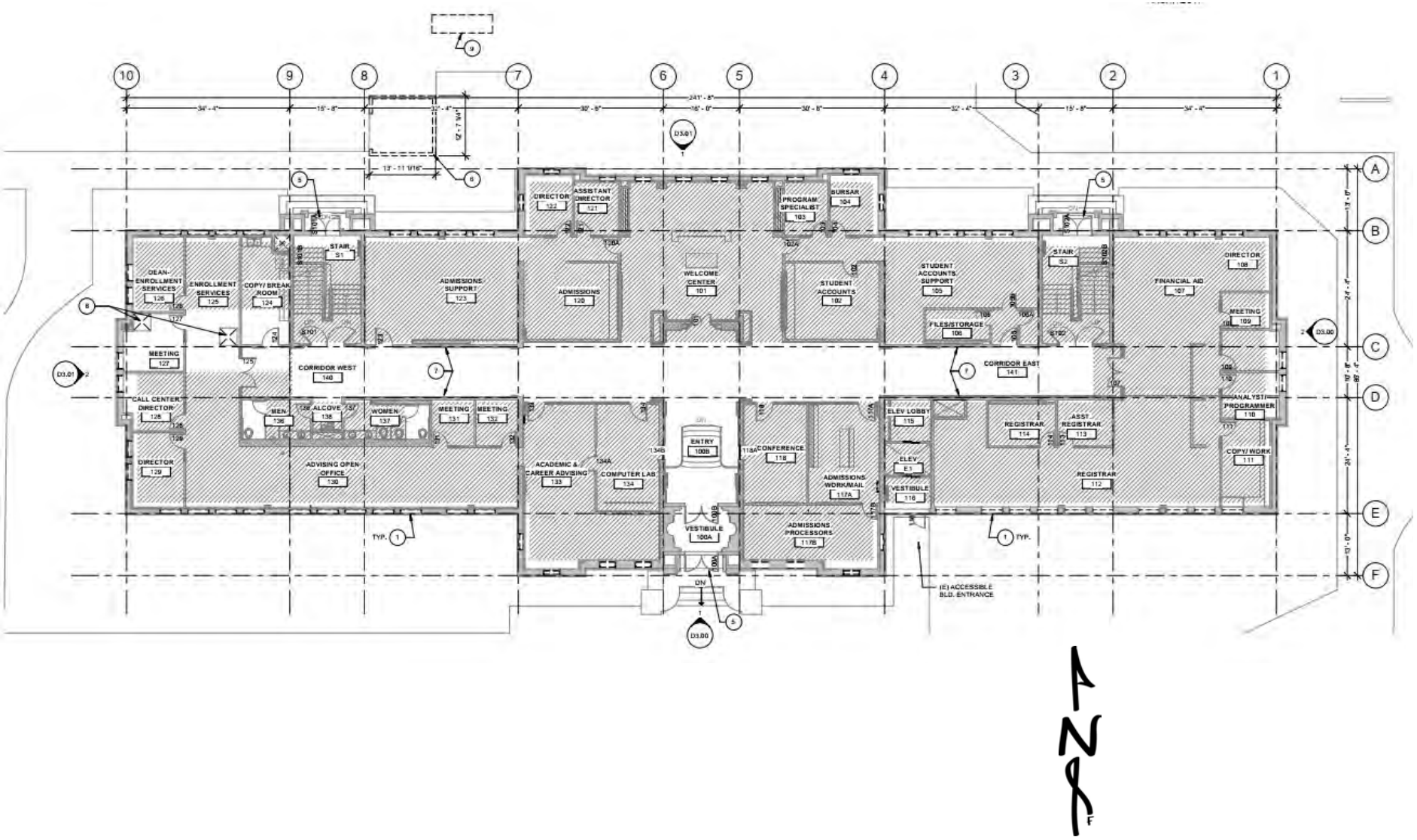
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453
Inlow Hall Basement . 223507.05 . NG . 5.24.23

Inlow Hall, Basement
La Grande, Oregon

ACM Location Drawing

FIGURE
02 8100-1

No ACM was identified on the first floor



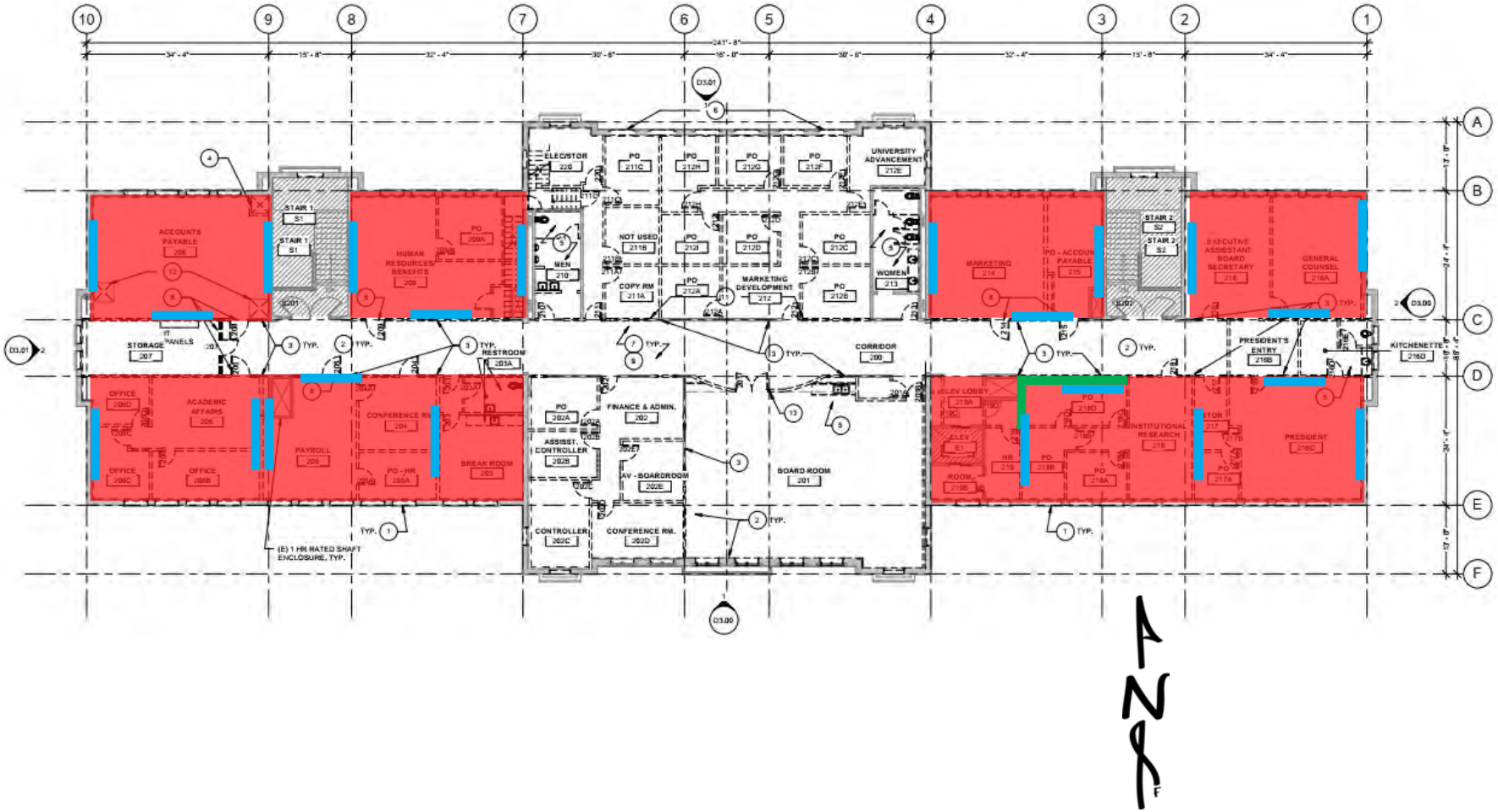
FULCRUM environmental consulting

- 9-inch vinyl tile beneath multiple layers of carpet and wood subfloor

- ACM texture on plaster walls

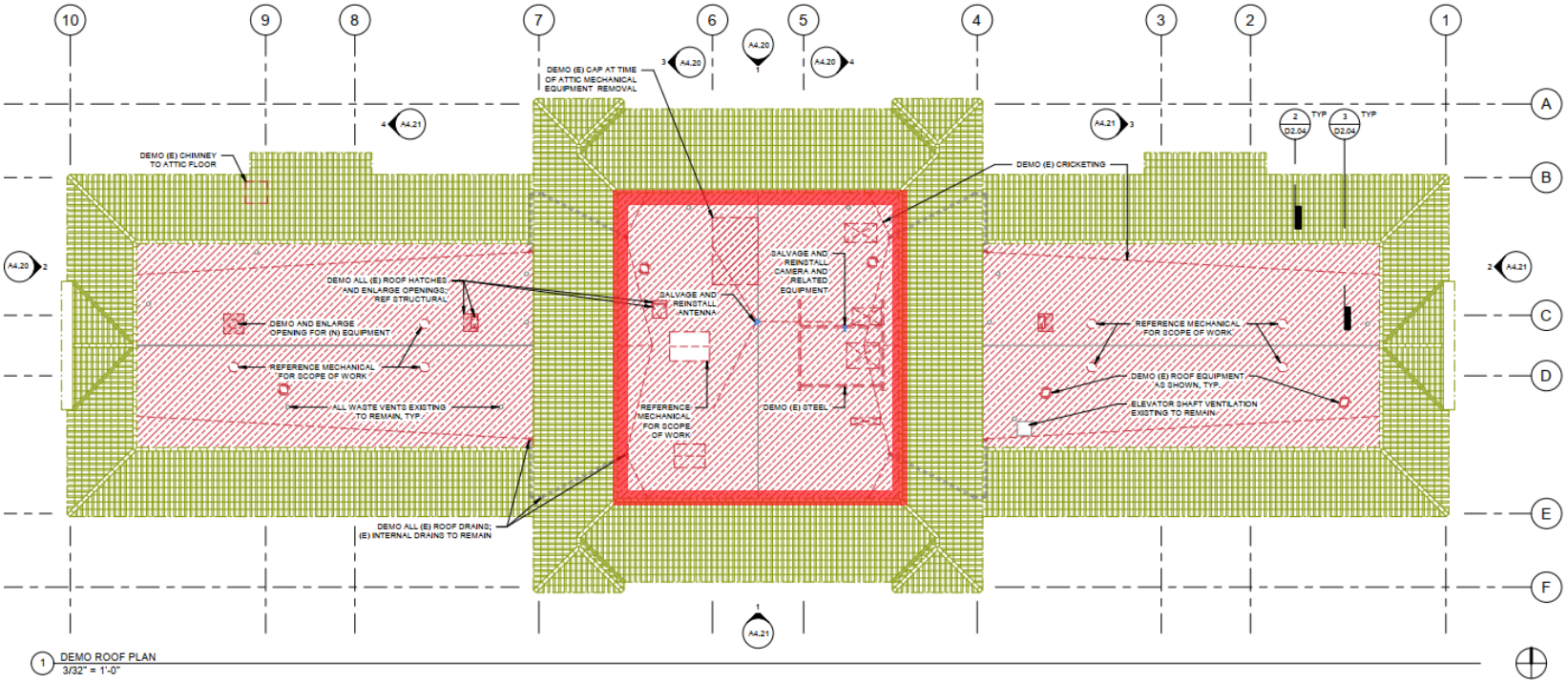
- Assumed ACM chalkboards locations

Assumed ACM chalkboards may be present behind gypsum wallboard walls in previous classroom areas



- ACM built-up roofing on center roof parapet and ACM black sealant on metal flashing along the perimeter

ACM black sealant is present on clay tiles and metal flashing



1 DEMO ROOF PLAN
3/32" = 1'-0"

ACM black sealant on metal flashing along perimeter

ACM built up roofing on center roof parapet

Fulcrum Environmental Consulting, Inc.
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Inlow Hall Roof . 223507.05 . NG . 5.24.23

Inlow Hall, Roof
La Grande, Oregon

ACM Location Drawing

FIGURE
02 8100-4

SECTION 028200
ASBESTOS CONTAINING MATERIALS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0, 1 and 2 Specification Sections, apply to this Section.

1.02 GENERAL CONDITIONS

A. Materials containing asbestos are present in Inlow Hall and include asbestos containing materials (ACM) which contain greater than one (1) percent (%) asbestos and materials that contain less than or equal (≤) to 1 percent asbestos. All ACM that will be impacted by renovation requires abatement prior to modernization of the building.

B. All costs associated with abatement and disposal of ACM, and specialized tasks to manage materials with ≤1% asbestos, as specified herein shall be included in the lump sum bid. Furnish all supervision, labor, materials, equipment, permits, personnel monitoring, environmental monitoring, etc. required to remove, handle, and dispose of ACM and associated components described in this Section.

C. Asbestos Hazard Emergency Response Act (AHERA) Project Design: This specification Section was prepared by Peggy Williamson an AHERA accredited Project Designer (#188737) with Fulcrum Environmental Consulting, Inc.

D. Documents for Reference: See Section 02 81 00 for a list of Hazardous Building Material (HBM) inspections and related sections.

E. Contents and Required Content Relocation: The Asbestos Contractor will relocate building contents, as necessary to access and abate ACM. Asbestos Contractor shall coordinate with the General Contractor to determine the extent of contents likely to be present in the abatement work area as well as responsibility for final disposition of any removed contents.

F. Demolition of Non-ACM Materials to Access ACM: Asbestos Contractor shall demolish all overlying materials necessary to access and abate ACM specified herein. Overlying non-ACM materials include, but are not limited to carpet, non-asbestos flooring, cabinets, and wall and ceiling materials. Asbestos Contractor shall be responsible for any remobilization costs associated with the failure to locate and remove all ACM that will be impacted by renovation.

G. The Asbestos Contractor shall stop work and contact the Owner's Representative if any suspect ACM are uncovered during the project that were not previously identified, or to determine if and what type of ACM may be impacted should the project scope of work require access or impact to areas outside those specifically identified in the specification.

H. Clearance Standard: All Areas will be subject to AHERA clearance standards. All work areas will be subject to visual inspections per the ASTM 1364-14 Standard for Visual Inspection for Asbestos Abatement Projects. All indoor work areas will additionally be subject to air sample analytical results. Air samples will be collected by the Owner's Representative under aggressive conditions and will be analyzed by either Phase Contrast Microscopy (PCM) per the National Institute of Occupational Safety and Health (NIOSH Method 7400, or Transmission Electron Microscopy (TEM) per the AHERA Method 40-CFR Part 763 Appendix A, Subpart E as specified herein. Exterior asbestos abatement will be cleared by visual inspections only, conducted by the Owner's Representative. Additional information on project clearance standards are present under the job conditions portion of this specification.

1. For small scale/short duration work areas (less than 25 linear or 10 square feet) the PCM clearance event shall be considered complete if the work area passes the visual inspection and the work-in-progress fiber concentrations do not exceed the higher of 0.01 fibers per cubic centimeter (f/cc) or the pre-abatement concentration, provided that the

pre-abatement concentrations do not exceed one-half of the personal exposure limit of 0.1 f/cc as identified in Oregon Administrative Rule (OAR) Chapter 437 Division 3 (437-003) and 29 Code of Federal Regulation (CFR) 1926.1101.

1.03 SUMMARY OF WORK

A. General: Work covered by this Section includes the handling of friable non-friable ACM and incidental procedures and equipment required to protect workers, and adjacent areas and occupants from airborne asbestos fibers during the work described. Portions of work include cleaning and decontamination of all areas from which ACM have been removed, application of a sealing agent, and appropriate disposal of all ACM, ACM debris and other non-ACM components scheduled for removal. For all ACM removed or ACM contaminated waste, Asbestos Contractor shall arrange and provide for burial at an appropriately permitted landfill.

B. Less than or Equal to 1% Asbestos Materials:
   1. Select 12-inch vinyl tile were reported with less than 1% asbestos content. The 12-inch vinyl tile is intermixed with 9-inch ACM floor tiles. Contractor shall remove all 12-inch vinyl tile intermixed with 9-inch vinyl tiles as ACM.
   2. Less than 1% asbestos black adhesive is associated with ACM vinyl floor tile. Contractor shall remove black adhesive concurrent with ACM vinyl tile.
   3. Gray window glazing around basement windows was reported with 1% asbestos content. Contractor shall remove all windows with gray glazing as ACM.

C. Areas of Work: The project consists of the modernization of Inlow Hall. No work is scheduled in select locations of the basement and first floor. ACM present in areas of the basement where no work is scheduled does not require abatement.

D. Contractor shall anticipate that the University campus will be occupied during and following the phases of asbestos abatement. Contractor shall secure the work area, and the Asbestos Contractor shall secure their tools, equipment, wastes, etc. within the work area, such that unauthorized personnel do not have access.

E. Schedule: Schedule coordination is solely the responsibility of the General Contractor and Asbestos Contractor. All requisite mobilizations or re-mobilizations shall be included in the bid. Actual areas of components and extent of materials to be abated shall be field verified in coordination with the General Contractor, Owner's Representative and Architect.

F. Work Practices: Work practices specified in base bid work shall be allowed if airborne fiber concentrations remain below levels specified in Table 2 "Asbestos Contractor Monitoring Schedule and Airborne Fiber Concentration". Should analytical results exceed specified airborne fiber concentrations, the steps outlined in the "Work Practices as a Function of Airborne Fiber Concentration" shall be followed.

G. Quantities: Dimensions, quantities, and locations are approximate, included solely to provide general information to the Asbestos Contractor. Asbestos Contractor shall be responsible for abatement of all ACM that will be impacted by renovation specified below without regard to accuracy of quantity or location recorded. The Asbestos Contractor shall be responsible for ACM in hidden locations, such as but not limited to, beneath or behind carpet, non-asbestos flooring, cabinets, and wall and ceiling materials. For the purposes of additive or deductive change-order requests, actual quantities must vary by more than fifteen (15) percent of the total quantity estimates provided before a change-order request will be considered. Asbestos Contractor shall visit the site and familiarize themselves with the work and conditions under which the work is to be performed.

H. Material Summary: The following table lists materials to be abated and is summarized by material description. Additional information pertaining to the location, accessibility, or specific abatement performance criteria by asbestos material type follows Table 1. The following abbreviations are used for brevity sake in the table: surfacing (SUR), thermal system insulation

(TSI), miscellaneous (MSC), quantity not specified (NS), square feet (SF), each (EA), lineal feet (LF).

Table 1: Asbestos Containing Materials Quantities

Material Description	Quantity	Unit
TSI: Pipe insulation	NS	-
TSI: Joints, Elbows, and Tees (JETs)	NS	-
SUR: Wall texturing	360	SF
SUR: Ceiling texturing	NS	-
MSC: Black roof sealant	210	LF
MSC: Built-up roofing	420	SF
MSC: Vinyl floor tile	6,200	SF
MSC: Assumed ACM Chalkboards	24	EA
MSC: Window units with ACM window glazing	40	EA

I. Thermal System insulation: Laboratory analysis identified thermal system insulation (TSI) consisting of hard, mudded-type asbestos containing insulation on pipe runs and on joints, elbows, tees, hanger, pipe hangers, pipe shoes, etc. (JETs). The material is commonly referred to as “mag-like”. Pipe insulations generally are 4-inch to 6-inch in diameter. Laboratory analysis identified 12% to 18% Chrysotile and 2% to 3% Amosite in the hard insulation. This material is classified as Thermal System Insulation under AHERA. TSI shall be abated consistent with requirements for an OAR 437-003, OAR 340 Division 248 (340-248) and 29 CFR 1926.1101 Class I material.

1. Contractor shall abate all TSI that may be impacted as needed to complete modernization activities, regardless of quantity, number of locations, height or accessibility including completion of selective demolition of finished materials to access all ACM and complete abatement. The Owner’s Representative will complete clearance inspections and air sampling events consistent with AHERA requirements for all work areas where TSI is abated.
    a. Asbestos Contractor shall abate all TSI by the glove bag method or wrap and cut methods.
    b. All piping proposed for wrap and cut methods shall be reviewed by the Asbestos Contractor with the General Contractor and receive the General Contractor’s approval before damaging piping systems.
    c. Select TSI locations are adjacent to wall surfaces and the ACM TSI may extend into or through the adjacent wall system. Contractor shall abate all ACM TSI extending into or through wall systems as needed to complete modernization activities.
    d. Contractor shall complete work-in progress air sampling for each worker completing glove bag or wrap and cut methods.
    e. Clearance for TSI abatement regulated work areas have less than 25 LF or 10 SF of TSI shall be by visual inspection only, provided that the Asbestos Contractor’s collected work-in-progress worker exposure samples do not exceed the higher of 0.01 f/cc or the pre-abatement level.
    f. Clearance for TSI abatement regulated work areas have less than 260 LF or 160 SF of TSI shall be by visual inspection, followed by aggressive air sample collection and analysis by PCM methods.
    g. Clearance for TSI abatement and any other materials present that exceed the 260 LF or 160 SF thresholds shall be by visual inspection, following by aggressive air sample collection and analysis by TEM methods.

J. Surfacing Materials: Laboratory analysis identified wall texturing in room 218D of the second floor of Inlow Hall and plaster ceiling patch texturing around pipe hanger penetrations in the basement hallway to contain asbestos. These materials are classified as Surfacing Materials

under AHERA. Surfacing abatement shall be occurring consistent with requirements for an OAR 437-003 Class I Material.

1. Wall texturing was reported to contain 1.25% to 2% Chrysotile and is present on the north and west plaster walls of Room 218D located on the second floor of Inlow Hall. The underlying plaster wall system shall also be considered ACM and shall be abated.
2. Plaster ceiling patch around pipe hanger penetrations was reported with 4% Chrysotile in the texture and 5% Chrysotile in the plaster. The ACM patch material is present around pipe hanger ceiling penetrations in the basement hallway of Inlow Hall. ACM patch material shall be abated as needed to facilitate modernizations.
3. All interior ACM surfacing abatement shall occur in an NPE.
4. Clearance inspection shall be a visual inspection followed by aggressive air sample collection and analysis by TEM methods.

H. Miscellaneous Materials: The following are classified as Miscellaneous Materials under AHERA. Miscellaneous material abatement shall be completed consistent with OAR 437-003 Class II requirements. Asbestos Contractor shall abate all MSC materials that will be impacted by pending modernization, regardless of quantity, number of locations, height, or accessibility including completion of selective demolition of finished materials to access all ACM and complete abatement. The Owner's Representative will complete clearance inspections and air sampling events consistent with AHERA requirements for all work areas where MSC is Abated.

1. Vinyl floor tile and adhesive: 9-inch vinyl floor tile that will be impacted by renovation is present on the east and west wings of the second floor of Inlow Hall. Laboratory analysis reported that the vinyl tile contains 3% Chrysotile asbestos and adhesives contain less than 0.25% Chrysotile asbestos. Small, localized areas of less than 1% asbestos 12-inch vinyl floor tile in dispersed withing the 9-inch vinyl floor tile area and is considered a patch material.
    a. The tile is beneath non-ACM carpet or underlying wood subfloor. The tile is present on wood substrate. All ACM vinyl tile and all underlying black adhesive shall be abated as ACM or ACM contaminated materials, regardless of asbestos content.
    b. Vinyl tile and adhesive abatement shall be completed within an NPE.
    c. Where adhesive is present on a wood substrate, the wood substrate shall be removed, or the substrate shall be cleaned of all adhesives. **Use of chemical strippers for adhesive abatement are prohibited.**
    d. Where other flooring materials have been used to patch an area, all patches shall be removed as ACM and all associated ACM shall be removed consistent with the abatement of ACM adhesives on the associated substrate.
    e. Asbestos Contractor shall abate all ACM floor tile and adhesives, including all overlying layers of flooring as asbestos containing waste regardless of thickness, number of layers, or underlying material type, etc.
    f. Vinyl floor tile and adhesive is anticipated to be trapped beneath walls, cabinets, etc. Walls, doorways, cabinets and other fixtures may require demolition to access the adhesive and complete abatement. Asbestos Contractor shall remove all vinyl floor tile and adhesive present in the locations identified as ACM waste.
    g. All floor tile and adhesive regulated areas will be cleared by a visual inspection followed by aggressive air sample collection and analysis by TEM methods.
2. Chalkboards and associated adhesive: Original chalkboards and associated adhesive may be present behind new gypsum wallboard walls and are assumed to be ACM. Original chalkboards are on original plaster walls on the east and west wings of the second floor where original classrooms were located.
    a. The chalkboards are present in areas where ACM vinyl tile will be abated.
    b. Chalkboard and associated adhesive abatement will take place concurrent with vinyl tile abatement and will be completed within an NPE.
    c. Adhesive is present on a plaster substrate. The plaster substrate shall be cleaned of

all adhesives.

d. Asbestos Contractor shall abate all ACM chalkboard and adhesives, including all overlying layers of gypsum wallboard regardless of thickness, number of layers, or underlying material type, etc. in area identified for renovation.
e. All chalkboard and adhesive regulated areas will be cleared by a visual inspection followed by aggressive air sample collection and analysis by TEM methods.

3. Black Roof Sealant: Asbestos containing black roof sealant is present on the center roof of Inlow Hall. Laboratory analysis reported the black roof sealant contains 12% Chrysotile asbestos.
   a. The black roof sealant is present on the metal flashing along the perimeter of the center roof and extends onto the adjacent clay tile in places. The black roof sealant was also used at the adjacent clay tile corner joints.
   b. Underlying metal flashing, adjacent clay tile that has sealant, and adjacent clay tile corner joints shall be disposed of as asbestos contaminated waste along with black roof sealant.
   c. Black roof sealant abatement will be cleared by a visual inspection only.
4. Built-up Roofing: Asbestos built-up roofing is present along the parapet of the center roof of Inlow Hall. Laboratory analysis reported the built-up roofing contains 7% Chrysotile asbestos.
   a. Built-up roofing, including all sealants, adhesives, tar, and felt layers and all layers are assumed to contain asbestos.
   b. The asbestos built-up roofing is present beneath a white membrane and on a wood substrate.
   c. Asbestos Contractor shall remove all layers of the built-up roofing and curbing systems, including the overlying white membrane, all built-up roofing layers, and any mop coat present, as asbestos containing waste, regardless of thickness, number of layers, or ACM content of the individual layers as asbestos containing waste.
   d. Built-up roofing abatement will be cleared by a visual inspection only.
5. Window Units with ACM Window Glazing: Window glazing is the material located between the glass and window frame. A window unit contains the window frame and multiple glass panes, The quantities reflected in Table 1 are the number of window units, not the number of individual glass panes. ACM window glazing is present on all basement exterior windows. Laboratory analysis reported the window glazing contains 1% Chrysotile Asbestos.
   a. Asbestos Contractor shall remove the window units as asbestos contaminated waste.
   b. Asbestos Contractor shall remove the window as a whole unit with glazing remaining intact. The window units shall be disposed of as ACM waste.
   c. Window glazing abatement shall be cleared by a visual inspection only.

1.04 ASBESTOS SPECIFIC SUBMITTALS

A. Pre-work Submittals: The following items shall be submitted and approved in writing by the Owner's Representative at least 10 working days prior to commencing work involving asbestos materials.
   1. Certifications: Submit documentation of a valid Asbestos Contractor License as specified under Oregon Revised Statute (ORS) 468A.707 and ORS 468A.720, and worker certifications and supervisor certifications for the State of Oregon specified under ORS 468A.730.
   2. Insurance: A Certificate of Insurance shall be provided naming the Eastern Oregon University as primary and noncontributory additional insured on the Asbestos Contractor's insurance policy. In addition to insurance requirements specified in the General Conditions, the Asbestos Contractor shall submit and maintain coverage types and

amounts in companies acceptable to the Owner of not less than $1,000,000 per occurrence Pollution Liability Insurance.

3. Permits and Notifications: Submit copies of all permits and notifications that are secured in conjunction with asbestos removal and encapsulation, hauling, and disposition. Provide timely notification of such actions as may be required by federal, tribal, state, regional, and local authorities including notification requirements identified in OAR 437-003 and OAR 340-248.
4. Asbestos Plan: Submit a site-specific plan of the work schedule and procedures to be used in the removal of materials containing asbestos. The Owner's Representative, prior to the start of any asbestos work, shall approve the asbestos plan. Such plan shall include the following:
    a. Site-specific health and safety summary.
    b. Location and layout of asbestos removal areas.
    c. Sequencing of asbestos related work.
    d. Disposal plan that includes the name and address of asbestos landfill; estimated waste quantity to be removed from work site; and procedures for hauling and disposal that comply with 40 CFR 61 Subpart M (NESHAP), 49 CFR Subchapter C (HMTA), and state, regional and local standards.
    e. Type of wetting agent and asbestos encapsulants to be used.
    f. Safety Data Sheets (SDS) for products stored or used onsite.
    g. Proposed analytical laboratory and proof of asbestos accreditation.
    h. Documentation that a respirator program has been established as required by ANSI Z88.2, 29 CFR 1910.134OAR 437-003-1101.
    i. Description of procedures to be used should asbestos become spilled during storage or transport.

B. Work-In-Progress Submittals: The Asbestos Contractor shall have the following documentation onsite and available for review by Owner's Representative during the project. Work-in-progress submittals shall also be included with post-work submittals.
1. Daily Logs: For each shift the Asbestos Contractor is onsite, a daily work log (Supervisor's report) shall be completed. Each log shall document at least the following information:
    a. Workers' name, certification number and expiration date.
    b. Worker/visitor entry/exit log to work zones.
    c. Respiratory protection used by each worker.
    d. Number and type of air samples collected.
    e. Number of bags or quantity of ACM removed from each work area.
    f. Problems or delays.
    g. Project progress.
2. Air Monitoring Records: All OAR 437-003 and OAR 340-248 compliance personal and area air monitoring shall be available for the Owner's Representative's review daily. Analytical results of samples collected by the Asbestos Contractor are required to be submitted for review by the Owner's Representative within 48 hours of sample collection.
3. Disposal Documentation: Disposal receipts (waste shipment records) shall be kept onsite for Owner's Representative review and submitted with project closeout documentation at the conclusion of each mobilization. As stated above, waste generation quantities shall be recorded in the Asbestos Contractor's daily logs and correlate with disposal receipts.
4. Notification Revisions: Notification of change in work dates, hours, practices, and quantities removed shall be submitted to the appropriate agencies and the Owner's Representative.

C. Post-work Submittals: Asbestos Contractor shall submit post-work project documentation to Owner's Representative within 10 days of substantial completion of each mobilization of asbestos abatement. Post-work submittals must be received and approved by Owner's

Representative prior to project payment. Post-work documentation shall include at least the following:

1. All permits and notifications.
2. All waste shipment records (signed by final disposal facility).
3. Daily work logs (Supervisor's report).
4. All air monitoring analytical results.
5. All worker certification documentation.

1.05 JOB CONDITIONS

A. Integration of Schedules: The Asbestos Contractor and General Contractor shall work closely together to integrate and schedule asbestos abatement activities. Asbestos Contractor shall complete abatement work, inclusive of time allowance for visual clearance inspection, prior to the abatement work area being released for general contractor access.
   1. For each area in which ACM abatement will occur, abatement, waste removal and visual clearance shall be scheduled and completed prior to all other construction and demolition activities that could have an adverse effect on the ACM.

B. Adjacent Areas: During performance of the ACM work, other contractors, EOU staff and students, and the public may occupy areas adjacent to the work. Asbestos Contractor shall collect daily perimeter phase contrast microscopy (PCM) samples during abatement activities. If perimeter thresholds are exceeded the Asbestos Contractor shall stop work and initiate corrective action. Asbestos Contractor shall not be permitted to resume work until perimeter air monitoring documents fiber concentration at or below pre-abatement levels.

C. Utility Availability: Power and water services at the site shall be the responsibility of the General Contractor and the Asbestos Contractor.

D. Coordination: Asbestos Contractor shall be responsible for coordinating notification, scheduling, and mobilization, of asbestos abatement work. Asbestos Contractor shall be responsible for remobilization and abatement costs for asbestos uncovered during renovation that were specified for removal under this Section but not abated prior to renovation. Asbestos Contractor coordination and scheduling shall allow for visual clearance inspection and receipt of corresponding analytical results as specified herein for substantial completion.

E. Substantial Completion: Substantial completion for the asbestos abatement portion of this project is defined as the time when all ACM has been abated from the identified areas for each phase of work and results of these samples are in complete compliance with the contract documents, and federal, state, and local regulation, whichever is most stringent.

F. Clearance Event: All work specified herein shall be subject to a clearance event completed by the Owner's Representative. A clearance event for the exterior work area consists of a visual inspection. If for any reason the work area is found to not be ready for a clearance event or the clearance event is determined to have failed, Asbestos Contractor shall be subject to accrued fees.
   1. Visual clearance: Asbestos Contractor will have notified the Owner's Representative that the work is complete and ready for a visual clearance a minimum of three (3) business days prior to the Asbestos Contractor's selected visual clearance date. The Owner's Representative shall notify the Asbestos Contractor of a passing visual work area inspection on the same day that the visual inspection is completed. A passed visual inspection will represent substantial completion of exterior asbestos abatement.
   2. Air clearance by transmission electron microscopy (TEM): Asbestos Contractor shall notify the Owner's Representative that the work is complete and ready for a TEM air clearance event a minimum of three (3) business days prior to Asbestos Contractor selected TEM Clearance event date. The Asbestos Contractor shall anticipate that the TEM analytical results will be received 3 business days after sample collection. The TEM clearance event

shall be considered complete if fiber concentrations do not exceed 70 structures per square millimeter (s/mm^2) for the average of not less than five samples collected within the work area.

3. Air clearance by phase contrast microscopy (PCM): The Asbestos Contractor shall notify the Owner's Representative that the work is complete and ready for a PCM air clearance event a minimum of two (2) business days prior to Asbestos Contractor selected PCM Clearance event date. Asbestos Contractor shall anticipate that the PCM analytical results will be received one (1) business day after sample collection. A PCM clearance event event shall be considered complete if fiber concentrations for each of five clearance samples do not exceed 0.01 fibers per cubic centimeter (f/cc) in portions of the building that will be modernized.
4. Unacceptable Clearance Results: Unacceptable clearance results, include but are not limited to, presence of remaining ACM, ACM debris, dust or other indications of incomplete cleaning, encapsulant that has not dried, overloading of cassettes with fibrous or non-fibrous materials, laboratory results at concentrations in excess of those allowed, etc.

G. Clearance inspections: Owner shall be responsible for providing five (5) TEM clearance events, three (3) PCM clearance events, and three (3) separate visual clearance events. A clearance event is defined as a visual inspection for an exterior building work area, or for interior spaces a visual inspection and collection of air samples following a period of time necessary for Asbestos Contractor applied encapsulant to dry. If a visual inspection or analytical results from a clearance event are unacceptable, subsequent re-sampling of a work area shall be accrued as an additional clearance event. The Asbestos Contractor shall be responsible for the cost of travel time, visual inspection, sample collection, shipping, and analysis for each additional clearance event in excess of the quantity stated above. The cost of each additional TEM clearance event **$2,800;** and the cost of each additional visual clearance event, or PCM clearance event is **$2,000**. If the number of work areas requiring clearance is extended in accordance with the General Conditions, costs will not be assessed until after the extended number has been reached.

H. Final Asbestos Abatement Completion: Final completion for the ACM abatement portion of this project is defined as the time when all post-work submittals, including waste shipment records signed by the disposal facility, are reviewed and approved by the Owner's Representative.

I. Condition of Payment: Asbestos Contractor may make request for payment as provided in other portions of the project specifications. However, payment shall not be made on any request until the following documents are received by the Owner's Representative:
1. Waste manifest and disposal receipts for all ACM waste removed from the site.
2. Laboratory results for all air samples collected by the Asbestos Contractor.
3. The Asbestos Contractor Daily Logs.

1.06 QUALITY CONTROL

A. General Air Monitoring: Asbestos Contractor is responsible for performing all monitoring of airborne concentrations of asbestos fibers, both personal and environmental, as required by 29 CFR 1910, 1926, OAR 437-003, OAR 340-248 and as specified herein. **Samples collected by Owner's Representative neither substitute for nor negate Contractor's responsibility for collecting similar samples for compliance purposes.**

B. Accredited Laboratory: An accredited laboratory shall analyze all samples taken by the Asbestos Contractor. Analytical results shall be made available to the Owner's Representative within 48 hours of sample collection.

C. Employee Monitoring: Asbestos Contractor bears sole and full responsibility for employee compliance air monitoring as required in 29 CFR 1926.1101, OAR 437-003, and applicable regulations.

D. Contractor Analytical Costs: Asbestos Contractor shall bear all analytical costs for samples obtained by the Asbestos Contractor.

E. Monitoring Prior to Asbestos Work: Owner will conduct pre-abatement PCM air monitoring prior to onset of asbestos abatement work in each work area. Owner's Representative shall collect a minimum of two (2) samples for PCM analysis from each work area.

F. Monitoring During Asbestos Work: Asbestos Contractor shall collect area, personal, and environmental air samples during abatement as required by applicable regulations and those specified in this section. Air samples shall be collected at a frequency consistent with the Asbestos Contractor Monitoring Schedule and Airborne Fiber Concentrations table and shall be within control limits. Additional engineering controls and personal protective measures shall be required if control limits are exceeded.

G. Work Practices as a Function of Airborne Fiber Concentrations: With prudent and proper work methods, it is not anticipated that airborne fiber concentrations will rise significantly above background or pre-abatement during specific abatement techniques including non-aggressive removal of substantially intact materials. By design, use of appropriate work methods should prevent fibers from being released to ambient air during these abatement activities.
   1. At any time, should air samples reach or exceed airborne fiber concentrations specified below in the table, abatement work must stop, change respirators (if necessary), and initiate cleaning. Removal or repair procedures shall not be resumed until the fiber count is reduced below the airborne fiber concentration specified below, and the Owner's Representative authorizes resumption of the abatement work.
   2. Following is the Asbestos Contractor's required sample collection frequency for each work area, associated fiber concentration control limits and assigned Respirator Protection Factor (RPF). Asbestos Contractor shall complete the following required sampling for each work area in which abatement or cleaning is occurring.

Table 2: Asbestos Contractor Monitoring Schedule and Airborne Fiber Concentrations

Area/Person to be Sampled	Samples per 8 hour shift	Minimum Sample Volume	Control Limit Concentration fibers/cubic centimeter (f/cc)
"Most Contaminated Worker" Peak	1	30 liters	0.5 x Respirator Protection Factor (RPF)
"Most Contaminated Worker"	1	240 liters	0.5 x RPF
Inside Work Area	1	960 liters	0.5 x RPF
Perimeter Adjacent to the Work Area	1	1,200 liters	0.01 or Pre-abatement, whichever is higher
Non-aggressive Intact Worker, Small Scale Short Duration work	1	560 liters	0.015 or 0.005 above Pre-abatement, whichever is higher
HEPA Exhaust	1	1,200 liters	0.01 or Pre-abatement, whichever is higher

H. Air Monitoring After Final Cleanup: A minimum of five (5) air samples per enclosed work area will be collected by the Owner's Representative following initial and final cleanup. **Final air samples in NPE work areas shall be taken under aggressive conditions.** Aggressive air sampling conditions consist of directing exhaust air from a portable air leaf blower at all work surfaces at a rate of 5 minutes/2,000 SF of enclosed space and placing fans on low speed to remain in operation throughout test. **Small scale/short duration work area clearance samples will be collected under ambient conditions.**
   1. PCM: Where PCM analysis is use, analytical results from final air tests must be less than 0.01 f/cc or the pre-abatement level, whichever is greater, provided that the pre-abatement fiber concentration does not exceed 0.05 f/cc, as determined by NIOSH Method 7400, Phase Contrast Microscopy. If for any reason, final air tests fiber

concentrations are indeterminate, including excessive particulate loading, analytical results shall be rejected and shall be considered a failed clearance event.

2. TEM: Where TEM analysis is specified for clearance, selected at the discretion of the Owner's Representative, or to settle a dispute, the average analytical results from final air tests must be less than 70 s/mm^2 of not less than five samples collected in accordance with AHERA criteria and evaluated under AHERA clearance criteria. If for any reason fiber concentrations of final air tests are indeterminate, including excessive particulate loading, analytical results shall be rejected and shall be considered a failed clearance event.

1.07 APPLICABLE CODES, REGULATIONS, AND PUBLICATIONS

A. Codes, Regulations and Standards: All applicable codes, regulations, and standards have the same force and effect, and are made a part of the contract documents as if copied directly into the contract documents, or as if published copies are bound herewith. Asbestos Contractor is responsible and liable for full compliance with all applicable federal, state, and local asbestos regulations.

B. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules and regulations of storing, transporting, and disposing of asbestos waste materials. Asbestos Contractor shall comply with 40 CFR Part 61, OAR 437-003, OAR 340-248, etc. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent shall apply.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. The Asbestos Contractor shall use equipment listed below. Deviations from any equipment listed herein shall be submitted to the Owner's Representative for approval. All such submittals must be accompanied by U.S. Department of Labor approval. Asbestos Contractor shall allow Owner's Representative to inspect any materials and equipment used during the project for suitability and/or condition.

1. Respirators: Minimal respiratory protection during asbestos removal activities shall be negative pressure, half-face respirator equipped with HEPA filtration cartridges. Select respirators from those approved by the Mine Safety and Health Administration (MSHA) or by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 42 CFR part 85 and as required under OAR 437-003-1101.
2. Protective Clothing: Asbestos Contractor shall supply protective clothing for all personnel and authorized visitors. Protective clothing shall be fire retardant disposable protective whole body clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Protective clothing shall be disposed of as contaminated waste at the end of each workday.
3. Eye Protection: Provide goggles to personnel engaged in asbestos operations when the use of a full-face respirator is not required.
4. Danger Signs and Labels: Provide danger signs, warning labels, and labeled barricades in accordance with OAR 437-002, OAR 437-003, 29 CFR 1910, 29 CFR 1926, and OAR 340-248.
5. Plastic Sheeting: Plastic sheeting shall be two layers of 6 mil (0.15 mm) thickness. Asbestos Contractor shall immediately repair any tears or punctures in sheeting to prevent ACM or water from contaminating underlying materials.
6. Adhesive Tape: Adhesive tape shall be capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheeting to finished or unfinished surfaces of dissimilar materials. Tape shall be capable of adhering under both dry and wet conditions, including use of amended water, and under variable temperature ranges.

7. Impermeable Containers: Impermeable Containers shall be both air- and water-tight. Containers shall be double-layered 6-mil plastic bags, each layer capable of being independently sealed. Alternate impermeable container systems must have two separate air and water-tight sealing mechanisms and be approved by the Owner's Representative prior to their use. Containers shall be labeled in accordance with 29 CFR 1926.1101, 40 CFR part 61, 49 CFR subchapter C, and OAR 340-248. Containers shall be transported to disposal site in an enclosed vehicle fully sealed with 6 mil polyethylene sheeting.
8. Pressure Differential Equipment: Pressure differential equipment shall be utilized continuously from first disturbance of ACM until completion of successful final inspection and acceptable analytical results from air clearance samples. Pressure differential equipment shall be high efficiency particulate air (HEPA) filtration systems equipped in compliance with ANSI 29.2-1979 (local exhaust ventilation) and EOA guidance document EPA 560/5-83-002 *Guidance for Controlling Friable Asbestos-Containing Materials in Buildings* Appendix F: Recommended. No air movement system or air filtering equipment shall discharge unfiltered air outside of the work area. Exchange rates in all areas of local HEPA exhaust and all NPE (including Mini-NPE) shall be maintained at no less than 4 air changes per hour as calculated by Asbestos Contractor and reviewed by the Owner's Representative.
    a. Asbestos Contractor is responsible for continuous monitoring and recording of pressure differential, through the use of a real time datalogging monitor or continuous strip chart readout, across NPE barriers using a pressure differential monitoring device(s). A minimum of -0.02 column inches of water pressure differential shall be maintained within the NPE.
9. Sealable Plastic Bags: Shall be 6 mil minimum thickness for transportation and disposal of asbestos contaminated material. All bags shall be labeled as required under applicable regulations.
10. Other Contaminated Materials: Such materials removed intact will be securely wrapped and taped in at least two layers of 6 mil polyethylene and labeled.
11. Special Materials: Use materials such as plywood, cardboard, polyethylene sheeting, etc., as necessary to protect non-movable objects in the work area from unnecessary damage resulting from abatement activity.

PART 3 EXECUTION

3.01 INSPECTION

A. Site Inspection: While performing asbestos related work, the Asbestos Contractor shall be subject to onsite inspection by the Owner's Representative who may be assisted by safety or health personnel. If work is found to be in violation of this specification, as determined by the Owner's Representative, a stop work order shall be in effect immediately and remain in effect until the violation is resolved. Standby time and any additional monitoring and laboratory analyses required to resolve and document violation resolution shall be at the Asbestos Contractor's expense.

B. Negative Pressure Enclosure: All NPE (including mini-NPE) shall be inspected and smoke tested daily by the Asbestos Contractor. Visual inspections by Owner's Representative will be at the Owner's Representative's sole discretion. Asbestos Contractor is required to notify the Owner's Representative a minimum of 2 days prior to an initial NPE visual inspection. Removal work in a NPE shall not commence until Owner's Representative inspects and accepts initial NPE construction or accepts documentation of Asbestos Contractor's inspection.

C. NPE Construction Requirements: Satisfactory completion of the following standard procedures and checks shall constitute acceptable NPE construction and inspection documentation.
    1. Negative air machines are sized and placed strategically to ensure airflow is strong and consistent throughout the enclosure, as evidenced by work area schematic drawings.

2. A minimum of four air exchanges per hour will be maintained in the NPE, as calculated by the Asbestos Contractor and accepted by the Owner's Representative. Note: Negative air machines with 2,000 cubic feet per minute (cfm) capacity shall be conservatively calculated to have a 1,500 cfm capacity (25% less capacity). If negative air machines of alternate capacity are used, their rating shall be conservatively calculated at 75% of manufacturer's rated capacity.
3. Visual inspection and smoke tests shall indicate that critical barriers, openings, and surfaces are sealed properly and that no enclosure breaches have occurred.
4. A minimum of -0.02 column inches of water pressure differential shall be maintained within the NPE as evidenced by a real time manometric measurement (a datalogging monitor or continuous strip chart readout). A means of manometric measurement shall be available for each NPE or mini-NPE work area and the data/strip chart must be available for inspection. The datalogging or continuous strip chart records for each NPE or mini-NPE work area shall be submitted as part of post-work documentation.
5. Smoke testing all corners and pockets of the enclosure document strong and consistent airflow towards HEPA filtration or collection device.
6. Record the person's name and negative air machine hours each time a pre-filter or HEPA filter is replaced.

D. Clearance Inspection: If the Owner's Representative is requested by the Asbestos Contractor to perform a cleanup or clearance inspection and arrives to find the work area not ready for inspection, the Asbestos Contractor will be responsible for any additional expenses incurred by the Owner's Representative. This will include any additional travel time, onsite time, and expenses resulting from inspection delay. Asbestos Contractor shall be subject to costs associated with a failed clearance event as described in this specification.

E. Transmission Electron Microscopy for Contract Disputes: If TEM is used to determine fiber types in order to resolve a dispute or receive final clearance then the cost of such analysis will be borne by the party requesting use of TEM analysis.

3.02 PREPARATION OF WORK AREAS

A. Previously Provided Information: All requirements specified previously in this Section or in other parts of the project specifications shall apply to the preparation of work areas.

B. Work Area Preparation: The Asbestos Contractor shall prepare each work area as required by applicable regulations.

C. Regulated Areas: Establish regulated areas in accordance with applicable regulations. At a minimum, seal off all critical barriers, openings, and all floors with two layers of 6 mil thickness polyethylene sheeting before commencing abatement work. Sheeting shall extend a minimum of 12 inches beyond adjacent surface interfaces and seam overlaps. Polyethylene sheeting layers shall be independently sealed. All seams will be sealed with tape to prevent leakage through floor and wall barriers.

D. Airlocks: Build airlocks at entrances to and exits from work areas.

E. Access/Egress and Decontamination Areas: Designate an area for worker and equipment entry and exit from the regulated area. Provide means of decontamination for workers and equipment. Regulated area works shall have access to hot and cold water for purposes of decontamination within the decontamination work area.

F. Respiratory Protection: Provide respiratory protection as required by applicable regulations.

G. Clean and Remove Objects: Wipe clean with cloths and amended water or HEPA filtered vacuum all objects to be removed from the work area. Owner's Representative will designate storage areas. The Asbestos Contractor is responsible for transportation of objects from the work area to designated storage areas or disposal.

H. Engineering Control Work Practices: Institute engineering control work practices in accordance with OAR 437-003 and OAR 340-248.

3.03 ASBESTOS REMOVAL

A. Removal Work: Perform all removal work in accordance with OAR 437-003 and OAR 340-248. All abatement shall occur with materials pre-wetted and wetted during removal sufficient to prevent fiber release. All ACM shall be containerized and secured at the end of each workday.

B. Friable ACMs: For all friable ACMs, Work Practices and Engineering Controls for Class I Asbestos Operations, shall be mandatory. No debris, unsecured equipment, tools, etc. shall remain onsite past the end of each workday.

C. Non-friable ACMs: Non-friable ACM shall be abated intact, non-aggressively and shall be conducted in a manner consistent with Class II operations identified in OAR 437-003.

D. Airborne Fiber Concentrations: Fiber concentrations, as described in the “Asbestos Contractor Monitoring Schedule and Airborne Fiber Concentration” table, shall not be exceeded during the work.

3.04 WASTE REMOVAL FROM THE WORK AREA

A. Gross asbestos debris shall be bagged by the end of each workday. ACM removed from work areas shall be sealed in clean impermeable disposal bags of 6 mil thickness immediately upon removal. External surfaces of bags shall be thoroughly cleaned in designated work area by wet sponging. Move bags into wash area, wet clean each bag thoroughly, place and seal in a second clean impermeable 6 mil bag, place bags in labeled containers for transport. Move containers to holding area pending removal to uncontaminated areas and transportation to landfill. Ensure that containers are removed from the holding area by workers dressed in clean coveralls who have entered from the equipment/waste load-out decontamination station or adjacent clean area. Ensure that workers do not enter from contaminated areas into the clean room during any phase of project performance. All personnel handling ACM shall wear protective clothing and respiratory protection.

3.05 CLEANUP OF WORK AREAS

A. After completion of gross removal work, remove visible accumulations of asbestos material and debris. Surfaces from which asbestos has been removed shall be wire brushed, and/or wet sponged, or cleaned by an equivalent method to remove all visible material. During this work, the surfaces being cleaned shall be kept wet.

B. Clean all other surfaces in the work area and any other contaminated areas with water and/or with HEPA vacuum equipment. After cleaning the work area, allow surfaces to dry completely (6-hrs. minimum). After a drying period, again wet clean or clean with HEPA vacuum equipment all surfaces in the work area. After completion of the second cleaning operation, the Owner's Representative will perform a complete and final visual inspection of the work area to ensure that ACM has been removed and the work area is dust and debris free.

C. Sealed containers and all equipment used in the work area shall be included in the cleanup and shall be removed from work areas, via the decontamination pathway.

D. If the area is free of dust, the Owner’s Representative will continue the clearance event. If the area is free of dust and debris, the Owner’s Representative may collect discretionary air samples to verify that the work area is substantially free of airborne fiber.

E. When the inspection and discretionary sampling indicates that the removal and cleanup performance is satisfactory and complete as determined by the Owner's Representative, all exposed surfaces shall be sealed with an approved encapsulant. Manufacturer's encapsulation instructions shall be strictly observed. The Owner’s Representative must approve deviation from Manufacturer’s instructions.

F. Following a period of time sufficient to allow the encapsulant to dry completely (6-hrs. minimum), the Owner's Representative will complete final air testing. Critical barriers including plastic sheets covering doors, vents, windows, air plenum grills, and the decontamination system barriers will be left in place during final air testing. If underlying surface cleaning or project performance is not satisfactory as determined by the Owner's Representative, re-clean all surfaces.

G. The Owner's Representative shall conduct final inspections on each work area. When final inspection and air testing determines that the area is free of visible accumulations of dust and ambient air is within control limits for "clean air," the decontamination enclosure systems shall be removed; the area thoroughly wet cleaned; and materials from the equipment and shower rooms disposed of as contaminated waste. A final check shall be carried out to ensure that no dust or debris remains on surfaces as a result of dismantling operations. Objects that were removed prior to abatement shall be relocated to the clean work area.

3.06 DECONTAMINATION

A. All entrants into the work area shall decontaminate before leaving the work area. Coveralls shall be HEPA vacuumed prior to removal. Decontamination of respiratory protection shall occur with the use of wet wipes. Contaminated wet wipes and coveralls shall be sealed in clean impermeable disposal bags of 6 mil thickness, placed in a second impermeable 6 mil bag, and disposed of as asbestos waste. A remote shower shall be made available within the decontamination area.

3.07 WASTE DISPOSAL

A. Asbestos Containing Materials and Asbestos Contaminated Waste: Transport sealed and labeled containers in a vehicle compartment completely enclosed with two layers of 6 mil polyethylene sheeting. Transport waste for disposal to the authorized site regularly, so that available onsite storage capacity is not exceeded. Waste shall be removed from the site at least weekly. Procedures for transport and disposal shall comply with 40 CFR 61 Subpart M (NESHAP); 49 CFR Subchapter C (HMTA); and state, regional, and local standards and regulations.

B. Landfill Criteria: Dispose of undamaged and sealed containers only at the approved disposal site. If containers have become broken or damaged during transportation, the damaged containers must be placed in a sealed drum and the entire contaminated drum must be buried. All ACM waste shall be disposed at a facility permitted under 40 CFR Subchapter I to accept asbestos waste.

C. Disposal Documentation: Submit Waste Shipment Record (WSR) documentation including name and address of landfill, name of landfill employee authorized to accept asbestos waste, quantity of waste removed from work site, and quantity of waste disposed of at the landfill. Local landfills accepting ACM waste may require two manifests accompanying each load; one copy will stay with the landfill and the second copy will be signed by the landfill and returned to the transport driver.

D. Hazardous Waste: If hazardous waste is generated, all documentation of waste characterization, transport and disposal shall be submitted to the Owner's Representative.

3.08 STANDARD TERMS

A. Air Monitoring: Process of measuring the asbestos fiber content of a specified volume of air in a stated period of time.

B. Asbestos Contractor: Contractor performing the asbestos abatement portion of this project.

C. Asbestos Containing Waste Material: Asbestos containing material or asbestos contaminated objects requiring disposal.

D. Authorized Visitor: Owner or his designated representatives or regulatory or other agency representatives having jurisdiction over the project.

E. Clearance: Point in time at which visual inspections and airborne fiber concentrations in the work area document that completion of abatement.

F. Clearance Event: A clearance event consists of a visual inspection followed by sample collection and laboratory analysis of air samples from within the work area and comparison to established clearance standards.

G. Control Limit: Refers to a maximum acceptable airborne fiber concentration given the engineering controls and PPE in place. Additional engineering controls and personal protective measures shall be required if maximum fiber concentration is exceeded.

H. Critical Barrier: An air- and water-tight covering constructed of two layers of 6-mil polyethylene plastic with each layer independently sealed with tape and spray adhesive that is placed over all penetrations of the floor, walls, and ceiling to prevent airborne asbestos from escaping into areas outside the work area or from lodging in cracks around the penetrations.

I. Decontamination Enclosure System: An enclosed area adjacent and connected to the regulated area. For a NPE the decontamination enclosure system consists of 3 stages: an equipment room, shower room, and clean room. For a mini-NPE the decontamination enclosure system consists of 2 stages: an equipment room, and clean room. A system is formed by connecting a series of rooms with curtained doorways. Each doorway forms airlocks between any two adjacent rooms. The system is used to remove asbestos contamination from workers, materials, and equipment.

J. Encapsulant: Liquid material which can be applied to ACM which controls the possible release of asbestos fibers either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

K. Environmental Monitoring: Completion of visual observations and environmental samples related to the project QA/QC and performance of the Asbestos Contractor.

L. Environmental Monitoring: Completion of visual observations and environmental sample collection and analysis related to the project QA/QC and performance of the Contractors.

M. Facility Component: Any pipe, duct, boiler, tank, reactor, turbine, furnace, etc. at or in a facility or any structural member of a facility.

N. Failed Clearance Event: A failed clearance event is an inspection by the Owner's Representative during which unacceptable clearance results, including but are not limited to, presence of ACM debris; remaining ACM, dust or other indications of incomplete cleaning; encapsulant that has not dried; overloading of cassettes, whether with fibrous or non-fibrous materials; laboratory results at concentrations in excess of established clearance standards, etc. that does not results in the successful completion of the clearance event.

O. Fixed Object: Piece of equipment or furniture in the work area that cannot be removed.

P. Friable Asbestos Material: Substance containing more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

Q. HEPA Equipment: A tool used during asbestos removal whose exhaust is filtered by means of a high efficiency particulate air filter. HEPA equipment shall be equipped with HEPA filters capable of removing 99.97% of all particulate to 0.3 microns in diameter.

R. Industry Standards: Applicable standards of construction industry that have the same force and effect on performance of the work as if copied directly into contract documents or bound and published therewith. Standards referenced in contract documents or in governing regulations have precedence over non-referenced standards, insofar as different standards may contain

overlapping or conflicting requirements. Comply with standards, wherever more stringent, in effect as of date of contract documents, unless otherwise indicated.

S. Local HEPA Exhaust: Ventilating the regulated area so that contaminated air is moved away from work and toward a filtration or collection device equipped with a HEPA filter. Air that has passed through the HEPA filter is then exhausted outdoors.

T. Mini-Negative Pressure Enclosure (Mini-NPE): Abatement method that establishes an NPE zone as a subarea of the total area. Refer to Negative Pressure Enclosure definition for additional design and monitoring requirements. Decontamination facilities typically consist of a two air chamber airlock. Work practices consist of double suiting, wet removal, and HEPA vacuuming.

U. Movable Object: Piece of equipment or furniture in the work area that can be removed.

V. Negative Pressure Enclosure (NPE): A method of confining a regulated area within impermeable barriers of polyethylene. A NPE can be of any configuration and shall, relative to outside areas, maintain a pressure differential of -0.02 column inches of water. A NPE shall be designed so that air inside the area can only exit through a HEPA filtered exhaust system. The HEPA system shall be capable of maintaining at least 4 air changes per hour and shall be capable of directing a constant low velocity air flow toward the HEPA filtration or a collection device. Typically, the NPE includes a three-stage decontamination system, wet removal, single suiting, and HEPA vacuuming.

W. Non-aggressive Removal: Taking out or stripping of wetted asbestos containing materials by methods such as spud bars, pry bars, shovels, knives, hatchets, etc. or by removing the entire component, such as a sink without impacting the ACM.

X. Non-Friable Asbestos Material: Substance containing greater than one percent asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during appropriate use, handling, demolition, storage, transportation, processing, or disposal.

Y. Owner's Representative: Person(s) designated by the Owner, to act in their behalf.

Z. Personal Monitoring: Sampling asbestos fiber concentrations within the employees breathing zone.

AA. Phase Contrast Microscopy (PCM): Method used to analyze air samples for the presence of fibers.

BB. Prior Experience: Experience required of the Asbestos Contractor on asbestos projects of similar nature and scope to ensure capability of performing the asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls demonstrated by that experience.

CC. Shower Room: Area between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and suitably arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.

DD. Surfactant: Chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

EE. Testing Laboratory: Independent entity engaged by the Owner, Owner's Representative or Asbestos Contractor to perform analysis of air samples and bulk samples. The laboratory shall be accredited by the Laboratory Accreditation Program of the American Industrial Hygiene Association (AIHA). The lab will be rated as "Proficient" in the AIHA Bulk Asbestos Proficiency Analytical Testing (BAPAT) Program for asbestos identification in bulk materials.

FF. Transmission Electron Microscopy: Method to analyze air or bulk samples for presence of asbestos.

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

HH. Wet Cleaning: Process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, and by afterwards disposing of these cleaning tools as asbestos contaminated waste. Use of HEPA filtered vacuums are recommended during wet cleaning.

II. Work Area: Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained or isolated work area is a work area that has been sealed, plasticized, and equipped with a decontamination enclosure system. A non-contained work area is a controlled access work area that has not been plasticized nor equipped with a decontamination enclosure system but has been demarked consistent with applicable regulations.

END OF SECTION

SECTION 02 8300
LEAD CONTAINING MATERIALS

PART 1 GENERAL

1.01 RELATED DOCUMENT

A. The Work of this Section applies to the Drawings, Specifications, and provisions of the Contract. The General Conditions, Supplementary General Conditions, Special Project Conditions, and other Division 0, 1 and 2 Specification Sections apply to the Work of this Section.

1.02 GENERAL CONDITIONS

A. All costs associated with lead containing materials (LCM) as specified herein shall be included in the lump sum bid. Furnish all supervision, labor, materials, equipment, permits, personnel monitoring, environmental monitoring, etc. required to remove, handle, and dispose of LCM and associated components described in this section.

B. Lead containing materials are present and may be impacted during the building renovation. Portions of the work area, adjacent buildings, and adjacent fields may be occupied during structure renovation.

C. Documents for Reference: See Section 02 8100 for a list of all Hazardous Building Material (HBM) inspection reports.

D. Paint that is characteristic of typical materials present was screened for lead using paint chip sampling and laboratory analysis to determine the concentration of lead in painted or coated surfaces. The lead concentrations in paint sampled are presented in Table 1 below:

TABLE 1: PAINT CHIP ANALYTICAL RESULTS

Sample Number	Location	Paint Color	Identified Component	Reporting Limit (mg/Kg)	Results in mg/Kg	Results in Percent
PC-M-01	Mezzanine	Orange	Structural Steel	96	**280,000**	28
PC-M-02	Mezzanine	Red	Steel Beam	120	**190,000**	19
PC-M-03	Mezzanine	White	Plaster	48	90	0.0090
PC-2F-01	2nd Floor	White	Plaster	51	**5,200**	0.52
PC-2F-02	2nd Floor	Red	Metal	120	**3,700**	0.37
PC-2F-03	2nd Floor	White	Wood	54	**1,700**	0.17
PC-2F-04	2nd Floor	Tan	Plaster	52	**5,400**	0.54
PC-2F-05	2nd Floor	Tan	Gypsum Wallboard	53	<53	<0.0053
PC-1F-01	1st Floor	White	Gypsum Wallboard	210	230	0.023
PC-1F-02	1st Floor	Gray	Wood	51	**1,200**	0.12
PC-1F-03	1st Floor	Gray	Wood	51	92	0.0092
PC-BT-01	Basement	White	Concrete	48	460	0.046
PC-BT-02	Basement	Green	Concrete	53	**900**	0.090
PC-BT-03	Basement	White	Wood	140	**16,000**	1.6
PC-BT-04	Basement	White	Plaster	49	340	0.034
PC-BT-05	Basement	White	Gypsum Wallboard	50	<50	<0.0050
PC-E-01	Exterior, 2nd Floor	Black	Wood	54	**26,000**	2.6
PC-E-02	Exterior, 1st Floor	Black	Wood	51	**300,000**	30
PC-E-03	Exterior, Basement	Black	Wood	53	**300,000**	30
PC-E-04	Exterior	Tan	Stucco	54	120	0.012
PC-E-05	Exterior	White	Wood	50	**120,000**	12
PC-E-06	Exterior	Gray	Wood	50	**83,000**	8.3

1. Concentrations above 900 milligram per Kilogram (mg/K), the general guideline for increased worker exposure risk, are presented in bold.
2. Additionally, glazed tile, wall block, metal pipe caps, plumbing components, roof jacks, solder and brazed components are assumed to be LCM.

E. Pursuant to the requirements of Oregon Administrative Rule (OAR) Chapter 437-003-1926.62, Contractor shall incorporate appropriate work practices, worker training, engineering controls, exposure assessments, and administrative controls, as defined in Contractor's written Lead Compliance Program, to minimize employee, subcontractor, and other site occupant exposure to lead-containing dust. Contractor shall also communicate potential lead hazards to employees, subcontractors, and other site occupants.

F. Contractor scope of work shall include appropriate assessment, characterization, and disposal of all demolition related wastes and elective segregation of demolition wastes. Contractor shall assume full responsibility for compliance with applicable federal state and local regulations pertaining to work practices, waste characterization, transport, and disposal of waste generated as a result of demolition activities.

G. Should a suspect LCM not discussed in this section be identified during the project, the Contractor shall stop work immediately and notify the Owner's Representative.

1.03 LEAD CONTAINING MATERIALS SPECIFIC SUBMITTALS

A. Pre-work Submittals: The following items shall be submitted and approved in writing by the Owner's Representative at least 10 working days prior to commencing work involving LCM.
   1. License: Contractor shall submit documentation of a valid Contractor License for the State of Oregon.
   2. Insurance: A Certificate of Insurance shall be provided naming the Owner as primary and noncontributory additional insured on the Contractors insurance policy. In addition to insurance requirements specified in the General Conditions, the Contractor shall submit and maintain coverage types and amounts in companies acceptable to the Owner of not less than $1,000,000 per occurrence Pollution Liability Insurance.
   3. Contractor Lead Compliance Plan. The Contractor shall submit a Lead Compliance Plan that is consistent with the Oregon Department of Consumer and Business Services, Occupational Safety and Health Division (Oregon OSHA), Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR) and Oregon Department of Environmental Quality (DEQ) regulation and guidelines, as well as acceptable to the selected disposal facility. Contractors work plan shall include a listing of materials and products, such as labels, signs, encapsulant and packaging materials, that will be used onsite during the Work.
   4. Documentation of worker training. Provide documentation that workers have been trained in accordance with OAR 437-003-1926.62.
   5. Waste characterization and disposal plan. Contractor shall submit a plan for characterizing demolition debris waste and identify where both solid and dangerous waste will be disposed.

B. Post-work Submittals: Contractor shall submit post-work project documentation to the Owner's Representative within 10 days of substantial completion of LCM work. Post-work submittals must be received and acknowledged by Owner's Representative prior to project payment. Post-work documentation shall include at least the following:
   1. Documentation of all waste characterization, transportation and disposal.
   2. All waste disposal manifests or bills of lading for waste that characterizes as solid waste.
   3. All uniform hazardous waste manifests signed by the final accepting facility for waste that is characterized as dangerous waste.
   4. All air monitoring analytical results.

1.04 JOB CONDIITONS

A. The Contractor shall integrate and schedule LCM impacting activities, worker protection, waste characterization, packaging, transport, and disposal activities with other site activities.

B. During performance of the LCM work, other contractors, public, and other professionals may occupy adjacent portions of the site.

C. Contractor shall complete LCM related work in accordance with work requirements of this specification and all local, state and federal requirements.

D. As a portion of the base bid, Contractor shall coordinate access to, and may be required to supply supplementary power and water during the work.

1.05 QUALITY CONTROL

A. Contractor is responsible for performing all monitoring of airborne concentrations of lead containing dust, including personal, environmental, perimeter, pre-abatement, and clearance, as required by OAR 437-003-1926.62.
   1. An accredited laboratory shall analyze all samples taken by the Contractor. Analytical results shall be made available to the Owner's Representative within 48 hours of sample completion.
   2. Contractor bears sole and full responsibility for employee compliance air monitoring as required in OAR 437-003-1926.62.
   3. Contractor shall bear all analytical costs for samples obtained by the Contractor.

B. Monitoring During LCM Work:
   1. Contractor shall collect required area, personal and environmental air samples during LCM impacting activities. Air samples shall be collected at a frequency consistent with the Contractor's Lead Compliance Plan and Oregon OSHA guidance for the type of work tasks being completed.
   2. If sample analysis documents concentrations in excess of regulatory action limits, or personal exposure limits, Contractor shall stop work and initiate corrective action. Contractor shall not be permitted to resume unrestricted work until corrective actions have been implemented and effectiveness documented by air monitoring results.

1.06 APPLICABLE CODES, REGULATIONS, AND PUBLICATIONS

A. All applicable codes, regulations, and standards have the same force and effect, and are made a part of the contract documents as if copied directly into the contract documents, or as if published copies are bound herewith. Contractor is responsible and liable for full compliance with all applicable federal, state and local regulations.

B. In addition to requirements of this specification, contractor shall comply with laws, ordinances, rules and regulations of storing, transporting, and disposing of solid waste materials. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent shall apply.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. The Contractor shall use equipment that is clean and in good working order and meets applicable agency approval. Equipment deviations shall be submitted to the Owner's Representative for approval. All such submittals must be accompanied by Oregon OSHA approval. Contractor shall allow the Owner's Representative to inspect any materials and equipment used during the project for suitability and/or condition.

PART 3 EXECUTION

3.01 WORK AREA PREPARATION

A. Contractor shall provide communication of potential lead hazards to employees, subcontractors, and other site occupants.

B. Contractor shall establish work areas and engineering control work practices in accordance with OAR 437-003-1926.62.

C. At a minimum, Contractor shall establish perimeter demarcating at an appropriate setback for demolition using at least barrier tape and warning signs.

3.02 LCM IMPACTING TASKS

A. Contractor shall perform all removal or demolition work in accordance with OAR 437-003-1926.62. To the extent feasible, all LCM shall be removed in as “intact” a state as feasible.

B. At a minimum, all employees shall be trained in accordance with OAR 437-003-1926.62 and a competent person shall be onsite during all LCM impacting tasks.

C. Minimum work practices for LCM impacting activities shall be as follows:
   1. Competent Person, as defined in OAR 437-003-1926.62, shall be onsite during any potentially LCM impacting activities.
   2. Complete the renovation or demolition activities consistent with the Contractor’s Lead Compliance Plan and Oregon OSHA work requirements including OAR 437-003-1926.62.
   3. Contractor shall continually wet those portions of the structure being impacted throughout the process to control fugitive dust. LCM debris shall be kept wet to minimize potential for windblown distribution.
   4. LCM debris shall be contained within the established work area.
   5. Contractor shall visually confirm removal of all LCM, any LCM impacted building debris, and any soils contaminated with LCM as the result of demolition or renovation.
   6. Contractor shall characterize demolition debris in accordance with Oregon DEQ guidance.
   7. Contractor shall dispose of debris in an appropriately permitted landfill.
   8. Contractor shall submit record of waste characterization and waste disposal with project closeout records.

3.03 CLEANUP OF WORK AREAS

A. After completion of gross demolition or renovation work, remove visible accumulations of LCM and debris remaining within work areas and in site soils. Contractor shall assume full responsibility for cleanup and removal of demolition debris. Resultant costs associated with LCM debris cleanup and removal associated with Contractor’s selected processes shall not be the basis for a contractor change order or delay claim.

3.04 WASTE DISPOSAL

A. Transport Criteria for Lead Containing Waste. Lead containing materials and lead-contaminated waste shall be transported in a completely enclosed vehicle compartment. Transport waste for disposal to the authorized site regularly, so that available onsite storage capacity is not exceeded. Frequency of transportation shall be at a minimum once a week. Procedures for transport and disposal shall comply with 49 CFR Subchapter C (HMTA); and state, regional, and local standards and regulations.

B. Landfill Criteria for Solid Waste. Transport and dispose of LCM contaminated demolition debris that characterizes as solid waste at an approved facility permitted under 40 CFR Subchapter I and Resource Conservation and Recovery Act (RCRA) Subtitle D to accept solid waste.

C. Landfill Criteria for Dangerous Waste. Dispose of LCM contaminated demolition debris that characterizes as dangerous waste at an approved facility permitted under 40 CFR Subchapter I and RCRA Subtitle C to accept dangerous waste. Contractor shall assume full responsibility for and include the cost of alternate discretionary demolition methods, additional waste characterization, transport and disposal of all demolition debris regardless of alternate waste characterizations results.

D. Solid Waste Disposal Documentation. Utilize a shipping manifest to document appropriate disposal of solid waste. The manifest shall include the name and address of landfill and quantity of waste disposed of at the landfill.

E. Dangerous Waste Disposal Documentation. Utilize a uniform hazardous waste manifest to document appropriate disposal of dangerous waste. The manifest shall include the name and

address of landfill and quantity of waste disposed of at the landfill and shall be signed by all applicable transporters and facilities, including the final disposal location.

F. Dangerous Waste. For all dangerous waste generated, documentation of all waste characterization, transport and disposal shall be submitted to the Owner's Representative at the conclusion of LCM impacting work.

END OF SECTION 02 8300

SECTION 02 8400
LIGHTING AND ELECTRICAL COMPONENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The Work of this Section applies to the Drawings, Specifications, and provisions of the Contract. The General Conditions, Supplementary General Conditions, Special Project Conditions, and other Division 0 1, and 2 Specification Sections apply to the Work of this Section.

1.02 GENERAL CONDITIONS

A. All costs associated with lighting and electrical component (LEC) abatement work as specified herein shall be included in the lump sum bid. Furnish all supervision, labor, materials, equipment, permits, personnel monitoring, environmental monitoring, etc. required to remove, handle, and dispose of LEC and associated components described in this section and in accordance with 40 Code of Federal Regulations (CFR) part 761, Oregon Department of Environmental Quality (DEQ) Oregon Administrative Rules (OAR) and other applicable local, state, and federal regulations.

B. Lighting and electrical components (LEC) consist predominantly of four-foot fluorescent lamps; four-foot light-emitting diode (LED) lamps; compact fluorescent lamps (CFL); and both electronic and magnetic ballasts. The light fixtures with magnetic ballasts are assumed to contain polychlorinated biphenyl (PCB) or other hazardous constituents. The following LEC components were identified in Inlow Hall:

Table 1: Lighting and Electrical Component Quantities

Component Description	4-Foot Lamps	CFL	Electric Ballasts	Magnetic Ballasts
Mezzanine	32	13	16	-
2nd Floor	528	26	264	16
1st Floor	252	63	126	28
Basement	232	2	116	17

C. Lighting fixtures will be entirely removed, retrofitted, or remain in-place depending upon the location. See Electrical Drawings sheets for fixture treatment in each location. Where fixtures or lamps require removal from the project site:
   1. Package fluorescent lamps, LED lamps and CFLs for offsite recycling.
   2. Fixtures with magnetic ballasts shall either be packaged for offsite disposal as potentially dangerous waste, or the magnetic ballast shall be separated from the fixture and packaged for offsite disposal as potentially dangerous waste.
   3. Fixtures with electrical ballasts can be managed as solid waste.

D. Contractor scope of work shall include the decontamination, disassembly, packing, marking, transportation, and disposal or recycling of identified LEC components scheduled for removal or retrofitting by appropriately trained workers. For purposes of disposal and documentation, all non-electronic ballasts shall be assumed to contain polychlorinated biphenyl (PCB) or other hazardous constituents, unless otherwise specified, and all lamps/tubes/bulbs/thermostats shall be assumed to be mercury containing.

E. Lighting and electrical components that will not remain in-place or be relocated shall be removed prior to building selective demolition or renovation that would impact the LEC. Portions of the work area, adjacent floors, and common areas may be occupied during LEC abatement.

F. Documents for Reference: See Section 028100 for a list of Hazardous Building Material (HBM) inspection reports.

G. Clearance Standard: All areas will be subject to a visual clearance event conducted by the Owner's Representative.

1.03 SUMMARY

A. Work covered by this section includes the handling of potentially hazardous materials and incidental procedures and equipment required to protect workers and building occupants from hazardous materials exposure. Portions of work include cleaning and decontamination of all LEC and immediate areas from which components have been removed; post-cleaning wipe sampling, if required; and timely disposal of all waste, inclusive of generated items and cleaned materials.

B. Actual areas of components specified for abatement shall be field verified in coordination with the General Contractor and the Owner's Representative. Fluorescent fixtures are located throughout the facility and are generally 4-foot in length.

C. Dimensions, quantities, and locations are approximate, included solely to provide general information to the Contractor. Contractor shall be responsible for abatement of all LEC without regard to accuracy of quantity or location recorded. For the purposes of additive or deductive change-order requests, actual quantities must vary by more than fifteen (15) percent of the total quantity estimates provided before a change-order request will be considered. Contractors shall visit the site and familiarize themselves with the work and work conditions.

D. Contractor shall coordinate and implement an effective lock out/tag out plan associated with LEC removal, including coordination with other site contractors, or other affected parties.

E. LEC are located at varying heights with some LEC at heights in excess of 10-feet above the surrounding surface. Contractor shall anticipate inclusion of applicable equipment and fall protection requirements necessary to safely remove these components.

F. Materials shall be transported offsite for disposal or recycling at an appropriately permitted site as required by the Environmental Protection Agency (EPA), Department of Transportation (DOT), and other applicable local, state and federal regulations. Mercury containing florescent lamps may be managed under the Universal Waste rule. Contractor shall pay all necessary fees and obtain all necessary permits related to the removal, handling, transportation, and disposal of LEC waste. Disposal documentation must be complete and submitted to the Owner's Representative before final payment for this work will be authorized.

G. Lamps: Mercury containing fluorescent lighting is present throughout Inlow Hall. Most of the fixtures are 4-foot in length. Contractor shall remove all fluorescent lamps that will no longer be used for offsite recycling.

H. Ballasts: Electronic and magnetic ballast were identified in Inlow Hall. Fluorescent fixtures that contained electronic ballasts do not require special waste handling. Fulcrum identified magnetic ballasts in scattered locations on each elevation. Magnetic ballasts are presumed to either contain polychlorinated biphenyls (PCB) or di (2-ethylhexyl) phthalate (DEHP). Contractor shall inspect all light fixtures to confirm if ballasts are electronic or magnetic, and remove all non-electronic ballasts for offsite disposal as PCB or DEHP containing waste.
   1. Fixtures with magnetic ballasts that were examined did not exhibit visual evidence of leakage other than occasional localized suspect stain. However, for purposes of bidding Contractor shall anticipate that ballast leak rate is between 5 to 10 percent of total fixtures.
   2. For fixtures exhibiting visual indications of ballast leaks, Contractor shall either dispose of the entire light fixture as PCB-contaminated or decontaminate non-ballast fixture components prior to staging separate from PCB wastes. Leaking ballasts shall be packaged for transport and disposal separate from other LEC waste.
   3. If fixture decontamination is elected, the Contractor shall demonstrate effective decontamination of visually stained lighting components by wipe sampling, in accordance with acceptable EPA protocol, a representative percentage of cleaned items. Contractor shall coordinate the visual clearance of LEC waste and LEC work areas by the Owner's Representative prior to offsite transport.

4. Contractor shall place cleaned metal fixture bodies at a location designated by the General Contractor for storage pending recycling or disposal.

I. Compact Fluorescent Bulbs: Mercury containing CFLs are located throughout Inlow Hall. If mercury containing CFLs require removal, they can be recycled under the Universal Waste rule.

1.04 LIGHTING AND ELECTRICAL COMPONENT SPECIFIC SUBMITTALS

A. Pre-work Submittals: The following items shall be submitted and accepted in writing by the Owner's Representative at least 10 working days prior to commencing work involving LEC materials.
   1. Contractor's License: Contractor shall submit documentation of a valid Contractor License.
   2. Insurance: A Certificate of Insurance shall be provided naming the Owner as primary and noncontributory additional insured on the Contractors insurance policy. In addition to insurance requirements specified in the General Conditions, the selected transporter shall submit and maintain coverage types and amounts in companies acceptable to the Owner of not less than $1,000,000 per occurrence Pollution Liability Insurance (Transporter).
   3. Permits and Notifications: Contractor shall submit copies of all applicable permits and notifications that are secured in conjunction with LEC removal, hauling, and disposal. Provide timely notification of such actions as may be required by federal, state, regional, and local authorities.
   4. Work Plan: Submit a detailed site-specific plan of the work schedule and procedures to be used in the removal of LEC. The plan shall detail the method of decontamination and post decontamination confirmation sampling. Such plan shall include a disposal plan that includes the name and address of the proposed disposal facility, and a description of procedures to be used should PCBs or mercury become spilled during removal, storage or transport.
   5. Contractor Qualifications: Contractor shall provide three references for projects completed in the past three years that demonstrate the firm performing the work is fully experienced in the removal, handling, storage, and transportation of LEC. Additionally, provide documentation of worker training.

B. Post-work Submittals: The Contractor shall submit post-work project documentation to Owner's Representative within 10 days of substantial completion of each phase of the work. Post-work submittals must be received and approved by Owner's Representative prior to project payment. Post-work documentation shall include at least the following:
   1. All permits and notifications not already submitted with pre-work submittals.
   2. Signed daily work logs (Supervisor's report) and inspection logs.
   3. Documentation of worker training not already submitted with pre-work submittals.
   4. Waste characterization and decontamination documentation.
   5. Transportation and Waste Manifests: Uniform Hazardous Waste manifests, shipping manifests, or Universal Waste bill of ladings, signed by the Contractor, transporter(s), and the disposal facility.

1.05 JOB CONDITIONS

A. Lighting and electrical component scope of work will be integrated and scheduled with other onsite activities. During performance of the LEC work, other contractors, public and other professionals may occupy the site or adjacent portions of the site. The Owner's Representative shall be notified in writing five (5) working days prior to LEC Contractor's mobilization or remobilization to the site.

B. Contractor shall coordinate access and may be responsible for supplying power and water during the work.

C. The Contractor shall maintain spill kits in work areas. Contractor shall provide spill cleanup materials, cleanup spills if they should occur, and appropriately characterize and dispose of any spill material generated during work.

D. Substantial Completion: Substantial completion for the LEC portion of this project is defined as the time when the following three conditions have been met:
   1. The visual clearance event completed by the Owner's Representative is determined to be acceptable.
   2. Results for all samples collected by the LEC Contractor and/or Owner's Representative are received from the independent testing laboratory.
   3. Sample results are in complete compliance with contract documents, and federal, state, and local regulations, whichever is most stringent.

E. Final Completion: Final completion for the abatement portion of this project is defined as the time when all post-work submittals, including Uniform Hazardous Waste Manifests, shipping manifests, or universal waste manifests signed by the disposal facility, are reviewed and accepted by the Owner's Representative.

1.06 QUALITY CONTROL

A. Contractor bears sole and full responsibility for monitoring airborne concentrations of suspect hazardous materials such as PCB or mercury in the work areas and for compliance monitoring of their employees' exposures. The threshold limit value (TLV) on an 8-hour time-weighted average (TWA) basis shall not be exceeded at any time.

B. All Contractor collected samples shall be analyzed by an independent, accredited laboratory of their choice. Contractor's laboratory of choice is subject to acceptance by the Owner's Representative. Analytical results will be made available to Owner's Representative within 72-hours of sampling. Contractor will bear all analytical costs for samples obtained by Contractor.

1.07 APPLICABLE CODES, REGULATIONS, AND PUBLICATIONS

A. All applicable codes, regulations, and standards have the same force and effect, and are made a part of the contract documents as if copied directly into the contract documents, or as if published copies are bound herewith. Contractor is responsible and liable for full compliance with all applicable federal, state and local LEC regulations.

B. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of storing, transporting, and disposing of LEC. Contractor shall comply with 40 CFR Part 761. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent shall apply.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Equipment and Materials: The Contractor shall use equipment that is clean and in good working order and meets applicable agency approval. Equipment deviations shall be submitted to Owner's Representative for approval. All such submittals must be accompanied by Oregon OSHA approval. Contractor shall allow Owner's Representative to inspect any materials and equipment used during the project for suitability and/or condition.

B. Danger Signs and Labels: As required by 29 CFR 1910, Contractor will provide caution signs and labeled barricades at all approaches to work areas. Locate signs at such a distance that personnel may read the signs and take the necessary protective steps required before entering the area.

C. As required by 40 CFR 761 Subpart C, provide labels of sufficient size to be clearly legible and affix on the exterior of all PCB Containers, PCB Article Containers, transport vehicles, and storage area(s) used to store PCB and PCB items for disposal.

D. Spill Kit: The Contractor will assemble and have in the work area at all times a spill kit. Contractor, as part of the approved Site Specific Work Plan, will provide a list of actual materials in the spill kit. At a minimum the spill kit will include the following items:
   1. PPE
   2. Signage/barriers

3. Spill control supplies
4. Blank area access logs
5. Waste containers

PART 3 EXECUTION

3.01 WORK AREA PREPARATION

A. Control Area: Prior to commencing any LEC-related work activities, Contractor shall isolate a control area around the abatement areas by physical boundaries, including barricades and warning signs, to clearly identify the work area and effectively guard against unauthorized entry.

B. Decontamination Area: Contractor shall construct a decontamination area as close as feasible to the control area. Personnel and equipment leaving the control area will use the decontamination area. Decontamination procedures shall be performed as outlined in Contractor's Work Plan.

3.02 LEC REMOVAL

C. Contractor shall select work procedures that minimize generation of debris/waste and handle suspect LEC such that no employee exposure or release to the environment occurs.

D. All generated waste shall be containerized and staged in a secured area at the end of each work shift. No unsecured debris, equipment, tools, etc., will remain in the Control Area past the end of each work shift.

E. Contractor shall handle PCB or mercury at ambient temperatures and not at elevated temperatures. Do not expose PCB or mercury to open flames or other high temperature sources. The PCB or mercury shall not be handled at temperatures greater than or equal to 32° C (90° F) without prior approval of Owner's Representative.

F. If exhaust ventilation is used as an engineering control the air shall be discharged outdoors and away from personnel.

G. Fixtures: A variety of lighting fixtures are present at the site. Fixture removal is not required as a portion of this LEC specification except where ballast failure has resulted in contamination of the fixture, or where the ballast cannot be reasonably separated from the fixture.

H. Lamps: All fluorescent lamps present within the project shall be assumed mercury containing and shall be recycled or disposed of as required for mercury containing components.
   1. Presence of "green caps" shall not be construed to mean that a lamp/tube is free of mercury.
   2. Lamp/tubes are typically 4-feet in length but may include both shorter and longer lengths.
   3. Contractor shall removal all lamp/tubes intact, or if broken, remove all pieces and all cleaning and spill response materials.

I. Ballasts: All Ballasts present within the project that are not labeled electronic shall be assumed PCB or other hazardous material containing and shall be disposed as PCB containing waste.
   1. Ballast types include, but are not limited to, those incorporated within a typical 4-foot-long ceiling mounted multi-lamp fixture with integral ballast packs.
   2. Ballasts include those that are presently operable and others that appear to have been disconnected.
   3. Ballasts are typically small, less than 15-pound units.

J. Switches: All glass electrical switches shall be assumed mercury containing and shall be recycled or disposed of as required for mercury containing components.
   1. Contractor shall removal all switches intact, or if broken, remove all pieces and all cleaning and spill response materials.

3.03 CLEANUP OF WORK AREAS

A. Spills of suspect hazardous materials shall be cleaned up immediately. At the end of each work shift and after the last ballast, lamp, CFL, thermostat, bulb or tube is processed, all tools and equipment used in the work area will be thoroughly cleaned and properly stored for reuse. Rags and cleaning fluids will be disposed of as potentially hazardous materials. Contractor shall make

all efforts to separate rags and debris associated with either PCB containing waste or mercury containing components into separate waste streams. Contractor shall be responsible for any waste generated due to cross contamination of waste streams.

B. Thoroughly clean all items and surfaces that may have encountered suspect PCB or mercury either during work activities or due to past leaks. Dispose of waste cleaning materials as suspect PCB or mercury waste. Any porous surface that is or becomes contaminated with suspect PCB or mercury shall be disposed of as PCB or mercury waste respectively.

C. In each work area, at the end of the Contractor's work, the Owner's Representative will complete a visual clearance event of the work area, cleaned items, and cleaned surfaces to determine if the work is complete.

3.04 WASTE DISPOSAL

A. Contractor shall be responsible for appropriate recycling or disposal of all LEC specified for removal.

B. Place all PCB items, hazardous waste or recyclable materials generated as a result of work activities in appropriate DOT approved shipping containers. Intact lamps and bulbs being sent offsite for recycling may be shipped in DOT approved shipping boxes.

C. Contractor shall comply with any additional packing instructions from the transfer, storage, and disposal (TSD) facility to which they will be shipped.

D. Suspect PCB wastes shall be transported by a Toxic Substances Control Act (TSCA) and hazardous waste permitted transporter, who has properly notified EPA of the transportation activity. Vehicles used for transporting PCB containing items must be plainly and visibly marked with a minimum of four PCB labels, as required by 40 CFR 761, Subpart C; and 49 CFR 178. Vehicles used for transporting all other LEC wastes shall be appropriately labeled in accordance with state and federal agencies.

E. Prior to removal of the waste from site, make the Uniform Hazardous Waste Manifests, shipping manifests, Universal Waste Manifests, transport vehicle, and the waste containers available to the Owner's Representative for viewing.

F. Provide copies of properly completed Uniform Hazardous Waste Manifests, shipping manifests, and Universal Waste Manifests from the transporter(s) and TSD to the Owner's Representative. Documentation must include the name and address of TSD facility, name of TSD employee authorized to accept waste, quantity manifested from work site, and quantity disposed at TSD facility.

G. Contractor shall submit documentation of any transportation-related irregularities and resulting actions to the Owner.

END OF SECTION 02 8400

SECTION 02 8500

REFRIGERANT CONTAINING SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The Work of this Section applies to the Drawings, Specifications, and provisions of the Contract. The General Conditions, Supplementary General Conditions, Special Project Conditions, and other Division 0 1, and 2 Specification Sections apply to the Work of this Section.

1.02 SUMMARY

A. Existing systems containing refrigerants, including ozone depleting compounds (ODC) and oil containing vessels associated with building system components are present. For items that will be removed from site and will no longer be used, the ODC and oils shall be recovered and recycled as a portion of the project.

B. All costs associated with capture, recycling, or destruction of refrigerants, including ODC and oil containing vessels associated with building system components, as specified herein, shall be included in the lump sum bid. Furnish all supervision, labor, materials, equipment, permits, personnel monitoring, environmental monitoring, etc. required to remove, handle, and dispose of ODC and associated components described in this section and in accordance with 40 Code of Federal Regulations (CFR) part 82, Subpart F; 40 CFR, Protection of the Environment; Oregon Department of Environmental Quality (DEQ) Oregon Administrative Rules (OAR) 340, and other applicable local, state, and federal regulations.

C. Contractor scope of work shall include the identification, recovery, and recycling/destruction of all ODC, and oils associated with buildings or equipment to be dismantled, demolished, or otherwise impacted during the project.

D. Material Summary: The following item will be relocated during the project:
   1. Two refrigerators (domestic type).
   2. 14 mini-refrigerators.
   3. Four Heating, Ventilation, and Air Conditioning units.
   4. 12 window mounted air conditioning units,
   5. Four Chilled drinking fountains.

E. If impacted items are not self-contained, then the following brief description of the materials and additional information pertaining to the location, accessibility, or specific abatement performance criteria by RCS material type apply.
   1. Oils shall be either be drained and recovered for recycling, or the entire oil containing component shall be removed and oil recovery completed by the recycler.
   2. All handling of refrigerant will be by Certified Refrigerant Technicians, approved by the U.S. EPA. Contractor is prohibited from the reuse or resale of refrigerants recovered from site systems. Contractor is prohibited from the venting of refrigerants into the environment.
   3. Materials shall be transported offsite for recycling or destruction at an appropriately permitted site as required by EPA, Department of Transportation (DOT), and other applicable local, state and federal regulations. Contractor shall pay all necessary fees and obtain all necessary permits related to the removal, handling, transportation, and destruction of refrigerants.

F. Documents for Reference: See Section 028100 for a list of all Hazardous Building Material (HBM) inspection reports.

G. Some ODC and oils are located at a substantial height above ground level and/or are only accessible from the exterior of the building. Contractor shall anticipate inclusion of applicable equipment and fall protection requirements necessary to safely remove these items.

1.03 ODC AND OILS SPECIFIC SUBMITTALS

A. Pre-work Submittals: The following items shall be submitted and accepted in writing by the Owner's Representative at least 10 working days prior to commencing work involving ODC.
   1. Insurance: A Certificate of Insurance shall be provided naming the Owner as primary and noncontributory additional insured on the Contractor's insurance policy. Contractor shall be responsible for insurance requirements specified in the General Conditions and Supplementary Conditions.
   2. Permits and Notifications: Submit copies of all permits and notifications that are secured in conjunction with ODC removal, transportation, and disposal. Provide timely notification of such actions as may be required by federal, state, regional, and local authorities. The site location is within the jurisdiction of the Oregon DEQ and is also subject to EPA regulations.
   3. Statement of Qualifications: Submit three references from project completed within the past three years that demonstrate that the firm performing the work is fully experienced in the identification, recovery, and recycling/destruction of refrigerants. Also submit documentation of universal technician certification or an appropriate combination of Type 1, Type 2, or Type 3 certifications.
   4. Refrigerant Recovery Plan: Submit a detailed site-specific plan of the work schedule and procedures to be used in the recovery of refrigerants. The Owner's Representative, prior to the start of any refrigerant recovery work, shall accept the plan. The plan shall detail the proposed method of refrigerant recovery, specification of all equipment utilized in recovery, Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and Underwriters Laboratories (UL) equipment certification, and methods of post-recovery testing to confirm removal of refrigerant. Such plan shall include a recycling or destruction plan that includes the name and address of the proposed recycling/destruction facility, and a description of methods of packaging, and method of transport for containerized refrigerant.

B. Post-work Submittals: The Contractor shall submit post-work project documentation to Owner's Representative within 10 working days of substantial completion of each phase of the work. Post-work submittals must be received and approved by Owner's Representative prior to project payment. Post-work documentation shall include at least the following:
   1. All permits and notifications not already submitted with pre-work submittals.
   2. All recycling, reclamation or destruction documentation has been provided to the Owner's Representative, including the completed Refrigerant Recovery, Reclamation or Destruction Documentation Form located at the end of this section.
   3. Signed daily work logs (Supervisor's report) and inspection logs.
   4. Documentation of worker training not already submitted with pre-work submittals.

1.04 JOB CONDITIONS

A. Schedule: ODC scope of work will be integrated and scheduled with the General Contractor's activities and is subject to the project phasing schedule.

B. Coordination: Contractor shall be responsible for all coordination, notification, scheduling, mobilization, and remobilization of ODC work with the General Contractor. For each area in which refrigerant recovery will occur, recovery shall be scheduled and completed prior to all other construction and demolition activities that could have an adverse effect on the ODC. The General Contractor and refrigerant Contractor shall work closely together to integrate and schedule refrigerant recovery activities with other site activities.

C. Utilities: Contractor and General Contractor shall be responsible for the provision of all power and water used during this project. Contractor shall implement an effective electrical safety and lockout-tagout program prior to working with energized refrigerant containing systems.

D. Substantial Completion: Substantial completion for the ODC portion of this project is defined as the time when the following three conditions have been met:
   1. All ODC have been removed from refrigerant containing components, systems, appliances, etc. subject to decommissioning.

2. Results for all samples collected and analyzed by the ODC Contractor, including any field testing to identify the type of refrigerant present and absence of refrigerants remaining has been submitted.
3. Documentation of the recycling or destruction of all refrigerants and oils recovered from the site has been transferred to the Owner and the summary of removal has been provided on the Form located at the end of this section.

E. Final Completion: Final completion for the ODC removal portion of this project is defined as the time when all post-work submittals, including Uniform Hazardous Waste Manifests and shipping manifests signed by the destruction facility, are reviewed and accepted by the Owner's Representative.

F. Condition of Payment: Contractor may make request for payment as provided in other portions of the project specifications. However, payment shall not be made on any request until the following documentation has been received by the Owner's Representative:
1. Waste manifest and reclamation receipts for all ODC removed from the site.
2. Results for all samples collected by the ODC Contractor, including any field testing to identify the type of refrigerant present and absence of refrigerants reaming has been submitted.
3. Documentation of the recycling or destruction of all refrigerants recovered from the site.

1.05 QUALITY CONTROL

A. Monitoring: Contractor bears sole and full responsibility for monitoring airborne concentrations of refrigerants for compliance monitoring of Contractor's employees' exposures. The threshold limit value on an 8-hour time-weighted average (TWA) basis, ceiling (C), or short-term excursion limit (STEL) shall not be exceeded at any time.

B. Contractor Samples: All Contractor collected samples shall be analyzed by an independent, accredited laboratory of their choice or by appropriate, calibrated field monitoring equipment. Contractor's laboratory of choice and field monitoring equipment is subject to acceptance by the Owner's Representative. Laboratory results will be made available to Owner's Representative within 72 hours of sample collection. Contractor will bear all analytical costs for samples obtained by Contractor.

1.06 APPLICABLE CODES, REGULATIONS, AND PUBLICATIONS

A. Applicable Regulations: All applicable codes, regulations, and standards have the same force and effect, and are made a part of the contract documents, as if copied directly into the contract documents, or as if published copies are bound herewith. Contractor is responsible and liable for full compliance with all applicable federal, state, and local regulations.

B. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of recovery, transport, and destruction of refrigerants. Comply with 40 CFR Part 82, Subpart F. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent shall apply.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. All equipment and materials used by Contractor for refrigerant recovery shall have Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and Underwriters Laboratories (UL) equipment certification. Personnel protective equipment must be approved by the American National Standards Institute (ANSI) or the National Institute for Occupational Safety and Health (NIOSH). Equipment and materials specified within this section may not be downgraded.

B. All equipment used in the recovery process shall be in good working order and calibrated per the manufacturer's recommendations.

PART 3 - EXECUTION

3.01 ODC RECOVERY

A. Capture Effectiveness: Contractor shall select work procedures that effectively capture not less than 90 percent of the refrigerant in each refrigerant containing system, component, or appliance. Contractor shall report to all required authorities and the Owner's Representative any release of ODC above the allowable limit.

B. Supervisory Responsibilities: All recovery shall be completed by the Certified Refrigeration Technician or where allowed an Apprentice working under the Certified Refrigeration Technician's supervision and direction. For each piece of equipment evacuated, the Certified Refrigeration Technician shall complete and provide a form summarizing the work, regardless of equipment capacity, refrigerant volume present, or refrigerant volume recovered.

C. Storage: All recovered refrigerant shall be stored in sealed containers that are staged at the end of each work shift in a secured and lockable location. Refrigerants and oils shall not be mixed. Refrigerant shall not be stored onsite more than five (5) consecutive days before offsite transport. No equipment, tools, etc., will remain unsecured at the end of each work shift.

3.02 OILS RECOVERY

A. Capture Effectiveness: Contractor shall select work procedures that effectively capture oil from each component or artifact.

B. Mixing: Oils that are visually distinct shall not be mixed.

C. Supervisory Responsibilities: All recovery shall be completed by a qualified worker under the supervision of a qualified supervisor.

D. Supervisory Responsibilities: All recovery shall be completed by a qualified worker under the supervision of a qualified supervisor.

E. Storage: All recovered oils shall be stored in sealed containers that are staged at the end of each work shift in a secured and lockable location. Refrigerants and oils shall not be mixed. Oils shall not be stored onsite more than five (5) consecutive days before offsite transport. No equipment, tools, etc., will remain unsecured at the end of each work shift.

3.03 INSPECTION

A. While performing ODC related work, Contractor shall be subject to review by Owner's Representative who may be assisted by safety or health personnel. If the work is found to be in violation of this specification or local, state, or federal law, Owner's Representative shall recommend to the General Contractor issuance of a stop work order to take effect immediately and remain in effect until the violation(s) is resolved. Standby time, monitoring, laboratory analyses, and any other expenses required to resolve and document resolution of the violation will be at refrigeration Contractor's expense.

B. Contractor is required to notify Owner's Representative within 48 hours prior to a requested visual inspection. The Owner's Representative may, at their sole discretion, elect to complete a visual inspection. If Owner's Representative is requested by Contractor to perform an inspection or a final inspection for substantial completion and arrives to find the work area is not ready for a visual inspection, the Contractor, and not the Owner, will be responsible for any additional expenses incurred by Owner's Representative. This will include any additional travel time, onsite time, and expenses resulting from the delay in final inspection.

3.04 RECLAMATION

A. All ODC shall be sent to a licensed and permitted reclamation or destruction facility.

B. Contractor is responsible for appropriate recycling or destruction of all ODC specified for removal.

C. All oils shall be recycled, or when found to contain other hazardous components, disposed as permitted by governing regulations.

3.05 TRANSPORTATION

A. Recovered ODC and oils shall be shipped to the reclamation facility within 20 days of recovery.

B. Recovered ODC shall be transported by a permitted and licensed transport in compliance with 48 CFR Part 82, Subpart F. Transport of oils shall be governed by state and federal regulations based on the volume and type of oils.

C. Prior to submittal of the shipment record, ODC and oil recovery inventory shall be submitted to the Owner's Representative or review. Contractor shall provide copies of properly completed forms and shipping manifests from the transporter(s) and reclamation facility to the Owner's Representative. Documentation must include:
   1. Date of shipment
   2. Quantity (by weight) reclaimed/recycled per shipment
   3. The percentage of the total amount of ODC reclaimed/recycled per shipment
   4. The dates of reclamation/recycling
   5. Name and address of reclamation facility
   6. Name of reclamation employee authorized to accept waste

D. Contractor shall submit documentation of any transportation-related irregularities and resulting actions to the Owner and Owner's Representative.

END OF SECTION 02 8500

Refrigerant Recovery, Reclamation or Destruction Documentation Form

Recovery/Reclamation Firm

Name:_____ Telephone:_____

Address:_____ E-mail:_____

_____

Recovery/Reclamation Technician Name:_____

Site Location:_____

Unit Description/Serial Number	Type of Refrigerant Recovered	Total Amount Recovered	Reclamation or Destruction Firm