ADDENDUM # 1

DATE: FEBRUARY 17, 2020

TO CONTRACT DOCUMENTS ENTITLED:

UNIVERSITY OF MISSOURI – ELLIS LIBRARY
WINDOW REPLACEMENT AND MASONRY RESTORATION

PROJECT NUMBER: CP201091

ADVERTISEMENT DATE: FEBRUARY 10, 2020

PREPARED FOR: The Curators of the University of Missouri

CONSULTANT: International Architects Atelier, Inc.
912 Broadway Suite 300
Kansas City, Missouri 64105
Telephone: (816) 471-6522

Specifications and Drawings for the above noted project and the work covered thereby are herein modified as follows, and except as set forth herein, otherwise remain unchanged and in full force and effect:

SPECIFICATION CHANGES:

1. Table of Contents
   REMOVE: Table of Contents
   ADD: Attached Table of Contents

2. Hazardous Building Material Survey
   ADD: 1.I Hazardous Building Material Survey

ATTACHMENTS:

1. TABLE OF CONTENTS
2. HAZARDOUS BUILDING MATERIAL SURVEY
3. UNIVERSAL HAZARDOUS MATERIALS REMOVAL AND DISPOSAL

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DIVISION 2

DIVISION 3 CONCRETE (NOT USED)

DIVISION 4 MASONRY

040342 HISTORIC STONE MASONRY REPAIR

040343 HISTORIC STONE MASONRY REPOINTING

045000 EXTERIOR MASONRY RESTORATION

DIVISION 5 METALS (NOT USED)

DIVISION 6 WOOD AND PLASTICS (NOT USED)

061000 ROUGH CARPENTRY

062023 INTERIOR FINISH CARPENTRY
MU EHS has completed a Hazardous Building Material Survey windows located on the 1st and 2nd floors of Ellis Library. The windows surveyed are located along the north face of the 1935 addition and the west face of the 1914 addition. The survey was made to determine the presence of Hazardous Building Materials that may be disturbed by planned repair and replacement of window’s and masonry sections. In accordance with state and federal law, licensed Missouri Asbestos Building Inspector conducted the building inspection. The licensed inspector for this project was Rudy Zachary (ACM License #14679, expires 11/04/20).

The inspection was conducted to satisfy the requirements of 40CFR 61, subpart M, which requires that all buildings be “thoroughly inspected” for asbestos before the commencement of renovation or demolition activities.

Suspect materials that will be disturbed by the stated scope of the project were collected and analyzed for the presence of asbestos.

Lead based paint is present on exterior window frames on both the 1st and 2nd floor windows identified for repair or replacement.

The second-floor arched windows in room 201 (nine windows) and 202 (11 windows) use lead came on all the stationary window panes. Lead came is not used on the casement portion of the windows. Three thousand five hundred and seven linear feet (3,507 est.) of ½ inch wide lead window came on 2nd floor.

Project specs call for the complete renovation of both rooms, these changes include the following; Removal and replacement of existing 2nd floor windows within study rooms 201 & 202 along with masonry repair and repainting of window sections on the 1st floor.
Field Observations
Window’s identified for replacement within rooms 201 & 202 are of varnished and painted wood construction. The window panes are set in metal frames with wood frames installed on top of the metal sections. Representative caulking and window glazing samples were collected from window frames from both the interior and exterior sides of windows with the exception of room 202, samples were not able to be collected from the exterior side of the windows. This also includes the top sections of windows within both rooms these areas were not accessible.

Glazing and Caulking Analysis Results
Representative samples of caulking and glazing materials were collected from multiple locations on the 1st & 2nd floors. Analysis results indicate that these materials are negative for asbestos.

Image of white window glazing on interior side of windows
SN200128-12 Negative for Asbestos

Image of light tan caulking on window frames
SN200128-13 Negative for Asbestos

Metal window came’s tested positive for lead
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description</th>
<th>Analysis results</th>
</tr>
</thead>
<tbody>
<tr>
<td>200128-01</td>
<td>White window glazing (interior) room 201</td>
<td>Negative for Asbestos</td>
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<tr>
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<td>• &lt;1% Chrysotile</td>
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<td>200128-02</td>
<td>Lt tan / off white window glazing (interior) room 201</td>
<td>Negative for Asbestos</td>
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<td>200128-03</td>
<td>Plaster finish coat sample damaged wall section room 201</td>
<td>Negative for Asbestos</td>
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<td>200128-04</td>
<td>White window glazing (interior) room 202</td>
<td>Negative for Asbestos</td>
</tr>
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<td>200128-05</td>
<td>Lt. gray window glazing (exterior) room 201</td>
<td>Negative for Asbestos</td>
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<td></td>
<td>• &lt;1% Chrysotile</td>
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<td>200128-06</td>
<td>Caulking from exterior window frame room 201</td>
<td>Negative for Asbestos</td>
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<td>200128-07</td>
<td>White window glazing from exterior window pane room 201</td>
<td>Negative for Asbestos</td>
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<td>200128-08</td>
<td>Exterior window caulking</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td>200128-09</td>
<td>Window glazing debris (interior) room 201</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• &lt;1% Chrysotile</td>
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<tr>
<td>200128-10</td>
<td>Exterior window frame caulking room 201</td>
<td>Negative for Asbestos</td>
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<td>Interior window glazing light tan room 201</td>
<td>Negative for Asbestos</td>
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<tr>
<td></td>
<td></td>
<td>• &lt;1% Chrysotile</td>
</tr>
<tr>
<td>200128-12</td>
<td>White Interior window glazing room 202</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• &lt;1% Chrysotile</td>
</tr>
<tr>
<td>200128-13</td>
<td>Lt tan caulking on interior windows room 202</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td>200128-14</td>
<td>Window glazing debris room 202</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td>200128-15</td>
<td>White window glazing sample 1st floor exterior</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td>200128-16</td>
<td>Caulking sample from window trim 1st floor exterior</td>
<td>Negative for Asbestos</td>
</tr>
<tr>
<td>200128-17</td>
<td>Caulk sample from 1st floor exterior</td>
<td>Negative for Asbestos</td>
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</tbody>
</table>
Sample Information Continued

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<th>Description</th>
<th>Analysis results</th>
</tr>
</thead>
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<td>200128-18</td>
<td>Window glazing sample 1st floor exterior west face</td>
<td>Negative for Asbestos</td>
</tr>
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<td>200128-19</td>
<td>Window glazing debris 1st floor exterior west face</td>
<td>Negative for Asbestos</td>
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<tr>
<td>200128-20</td>
<td>Caulk sample from window frame 1st floor exterior west face</td>
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</tr>
<tr>
<td>200206-01</td>
<td>White window glazing sample exterior room 201</td>
<td>Negative for Asbestos</td>
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</tbody>
</table>
Sample Locations 1st floor
Sample Locations 2nd floor

```
200128-04
200128-12
200206-08
200128-13
Study Room 202
200128-14

200128-03
200128-11
200128-09
200206-07
200128-10
200128-08
200128-01
200206-02
200128-02
200206-03
200128-05
200128-06
200128-07
200206-04
200206-05
```

Study Room 201

Hazardous Building Material Survey
Ellis Library Window replacement and Repair
CP201091
Lead Paint Survey

A Niton XL2 was used to check painted plaster wall sections along with painted wood window frames located on the 1st and 2nd floor of Ellis Library. The Niton was checked before the survey and found to be in calibration.

HUD has established a lead standard of 1.0 mg/cm² for child-occupied facilities. This does not relate directly to this project, but is a useful guideline in evaluating lead in painted and varnished surfaces. The surveyor for this project was Rudy Zachary License number 101220-300003103 exp. 12/20/2020

OSHA has found that certain work, including aggressive disturbance of the painted surface, may result in lead levels exceeding the Action Level or Permissible Exposure Limit (PEL) – even when the concentration of lead is below 1 mg/cm².

Lead Summary: The windows within the project area utilize a lead came as the window pane frames. Brown paint present on wall sections adjacent to the window frames within room 201 are positive for lead. White paint on exterior window frames is positive for lead.

Note: The lead came is a hazardous material and cannot be disposed of as general debris. The lead came windows can be resold or recycled, but not disposed of as debris. The contractor can remove the lead came from the windows and recycle, or collected in MU-EHS provided containers that will be picked-up by MU-EHS for proper disposal.

The white paint on plastered wall sections within room 202 tested negative.

<table>
<thead>
<tr>
<th>Location and Description</th>
<th>Sample Number &amp; Readings (mg/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study room 201</strong></td>
<td>01 White paint on window sill exterior</td>
</tr>
<tr>
<td></td>
<td>• 1.33, 1.34, 1.23</td>
</tr>
<tr>
<td></td>
<td>02 Varnished wood window frame interior</td>
</tr>
<tr>
<td></td>
<td>• 0.04, 0.12, 0.51</td>
</tr>
<tr>
<td></td>
<td>03 Metal window frame</td>
</tr>
<tr>
<td></td>
<td>• 15.99, 16.62</td>
</tr>
<tr>
<td></td>
<td>04 Brown paint on interior walls</td>
</tr>
<tr>
<td></td>
<td>• 7.68, 9.25, 4.99</td>
</tr>
<tr>
<td></td>
<td>05 White paint on exterior window frame</td>
</tr>
<tr>
<td></td>
<td>• 2.36, 1.99, 2.45</td>
</tr>
<tr>
<td></td>
<td>06 Window Pane frame metal</td>
</tr>
<tr>
<td></td>
<td>• 1.42, 1.83, 2.54</td>
</tr>
<tr>
<td>Location and Description</td>
<td>Sample Number &amp; Readings (mg/cm²)</td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td><strong>Study room 202</strong></td>
<td></td>
</tr>
<tr>
<td>07 Brown paint on interior wall</td>
<td>7.11, 7.68</td>
</tr>
<tr>
<td>08 White paint on window frame (exterior)</td>
<td>1.99, 1.31, 1.62</td>
</tr>
<tr>
<td>09 Brown paint on interior wall section</td>
<td>9.02, 5.30</td>
</tr>
<tr>
<td>10 White paint on exterior window frame</td>
<td>1.95, 1.93, 1.83</td>
</tr>
<tr>
<td>11 White paint on plaster wall sections adjacent to window</td>
<td>0.04, 0.02</td>
</tr>
<tr>
<td>12 Varnished wood window frames</td>
<td>0.04, 0.01</td>
</tr>
<tr>
<td>13 Metal window frame section</td>
<td>20.15, 9.57, 16.52</td>
</tr>
<tr>
<td>14 White paint on plaster wall section adjacent to window</td>
<td>0.07, 0.13</td>
</tr>
<tr>
<td><strong>1st floor North face exterior paint testing (room’s 101 &amp; 101B)</strong></td>
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<tr>
<td>15 White paint on window frame</td>
<td>4.43, 4.28</td>
</tr>
<tr>
<td>16 White paint on window trim</td>
<td>1.14, 7.74</td>
</tr>
<tr>
<td>17 White paint on window frame</td>
<td>3.27, 1.05</td>
</tr>
<tr>
<td>18 White paint on window trim</td>
<td>4.78, 7.20</td>
</tr>
<tr>
<td>19 White paint on exterior window frame west side of bldg.</td>
<td>3.40, 10.28</td>
</tr>
<tr>
<td>20 Tan paint on corner of bldg. west face</td>
<td>1.90, 3.64</td>
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<tr>
<td><strong>1st floor interior offices window frames room 101 101B</strong></td>
<td></td>
</tr>
<tr>
<td>Window frame &amp; Trim</td>
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</tr>
<tr>
<td>Loc #1</td>
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</tr>
<tr>
<td>0.08 Frame</td>
<td></td>
</tr>
<tr>
<td>3.95 Trim</td>
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<tr>
<td>Loc #2</td>
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<tr>
<td>6.08 frame</td>
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<tr>
<td>0.08 Trim</td>
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</tbody>
</table>
Lead Paint Testing Locations

- White Paint: 1.33, 1.34, 1.23
- Wood Frame: 0.04, 0.12, 0.51
- Metal Frame: 15.99, 16.62
- Brown Paint: 7.68, 9.25, 4.99
- Metal Frame: 1.42, 1.83, 2.54
- White paint: 2.36, 1.99, 2.45
- Brown Paint: 7.11, 7.68
- White paint: 1.99, 1.31
- Brown Paint: 9.02, 5.30
- White paint: 1.95, 1.93,
Lead Paint Testing Locations Continued

- White Paint: 0.04, 0.02
- Varnished wood: 0.04, 0.01
- Metal window frame: 20.15, 9.57, 16.52
- White paint: 0.07, 0.13, 0.06
- Varnished wood: 0.07, 0.04
- Study Room 202
- Metal window frame: 15.14, 17.21, 15.23
Lead Paint Testing Locations Continued 1st floor

- White paint 1.90, 3.64
- White paint 4.78, 7.20
- White paint 3.27, 1.05, 2.12
- White paint 1.14, 7.74
- White paint 4.43, 4.28

Rooms 114A & 114 were not accessible at time of inspection.

Room 115C window trim is varnished wood.

Interior Window 6.08 Frame 0.08 trim
Interior Window 0.08 Frame 3.95 trim

180 General Services Bldg, Columbia, MO 65211 Phone: 573-882-7018 Fax: 573-882-7940 ehs.missouri.edu
PART 1 - GENERAL
Provisions of the General Conditions and Special Conditions are part of this Division.

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 The Contractor shall inform him/herself of the conditions for the project, and is responsible for verifying the quantities and location of all work to be performed as outlined in this section. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract. The work of the Contract can be summarized as follows:

The work consists of the proper removal of the following approximate quantities of hazardous materials from Ellis Library Demolition:

Demolition/Construction Waste

Hazardous Waste

The second floor arched windows in room 201 (nine windows) and 202 (11 windows) use lead came on all the stationary window panes. Lead came is not used on the casement portion of the windows. The lead came is a hazardous material and cannot be disposed of as general debris. The lead came windows can be resold or recycled, but not disposed of as debris. The contractor can remove the lead came from the windows and recycle, or collected in MU-EHS provided containers that will be picked-up by MU-EHS for proper disposal.

Universal Waste

NA

Reclaim/Recycle

NA

Building Materials Painted with Regulated Heavy Metals

Fifty-one (51) windows painted with lead paint (exterior)

Three thousand five hundred and seven linear feet (3,507) of ½ inch wide lead window came on 2nd floor.
1.2 CODES AND REGULATIONS:

1.1.2.1 All applicable codes, regulations, standards, statutes, laws, and rules have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. Where conflicts arise, the most stringent specification shall apply.

1.1.2.2 Federal and State requirements which govern universal and hazardous removal work or hauling and disposal of such waste materials include but are not limited to the following:


1.1.2.2.1.1 Construction Industry - 29 CFR 1926.1101
1.1.2.2.1.2 Respiratory Protection – 29 CFR 1910.134
1.1.2.2.1.3 Hazard Communication – 29 CFR 1910.1200
1.1.2.2.1.4 Accident Prevention Signs – 29 CFR 1910.145

1.1.2.2.2 U.S. Environmental Protection Agency (EPA)

1.1.2.2.5 1.1.3 CONTRACTOR’S DUTIES

1.1.3.1 Except as specifically noted, provide and pay for:

- Labor, materials, and equipment.
- Tools, construction equipment, and machinery.
- Other facilities and services necessary for proper execution and completion of work.

1.1.3.2 Pay legally required sales, consumer, use, payroll, privilege and other taxes. Retail sales tax shall not be included in the bid amount.

1.1.3.3 Secure and pay for, as necessary for proper execution and completion of work, and as applicable at the time of bids:

- Permits
- Government Fees
- Licenses
- Except where specifically noted, provide and pay for waste disposal permits and costs
1.1.3.4 Give required notices.

1.1.3.5 Contractor shall assume full responsibility and liability for compliance with all codes, ordinances, rules, regulations, orders and other legal requirements of Local, State, and Federal public authorities including Environmental Protection Agency (EPA) regulations, Missouri Department of Natural Resources (MDNR) and Occupational Safety and Health Administration (OSHA) which bear on performance work. Where conflicts occur between these specifications and/or the above-mentioned regulations, the more stringent shall govern. The Contractor shall hold the owner and owner's air monitoring firm harmless for failure to comply with any applicable work, hauling, safety, health, or other regulations on the part of the contractor, contractor’s employees, or contractor’s subcontractors.

1.1.3.6 If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify MU in writing, and any necessary changes shall be accomplished by appropriate modification. It is not the Contractor's responsibility to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to MU, he shall assume full responsibility therefore and shall bear all cost attributable thereto.

1.1.3.7 Enforce strict discipline and good order among employees. Do not employ unfit persons or persons not skilled in assigned task.

1.1.3.8 Comply with all applicable federal, state, and local laws regarding job discrimination and payment of prevailing wage rates for the base bid.

1.1.3.9 The use of the best available technology, procedures, and methods for preparation, execution, cleanup, disposal, and safety are absolutely required. This compliance is the sole responsibility of the abatement contractor.

1.1.3.10 Assume responsibility for the proper and safe execution of the work.

1.1.8 COORDINATION: The hazard remediation contractor shall be responsible for the coordination of the universal/hazardous materials removal for this project. The hazard remediation contractor shall coordinate with all other on-site contractors and all subcontractors working under separate contracts so as to facilitate the general progress of the work. Each trade shall afford all trades every reasonable opportunity for the installation of their work.
1.2 STOP WORK

1.2.1 If the Owner, or his designated representative, presents a written or verbal stop work order, immediately stop all work or that portion of the work designated. A verbal stop work order shall be confirmed by a written stop work order within 24 hours. Do not commence referenced work until authorized in writing by the Owner or his representative.

1.3 CONTRACTOR USE OF PREMISES

1.3.1 GENERAL: During the construction period for the building, the hazard remediation will have full access to Women’s and Children’s Hospital Boiler Replacement for construction operations. Owner will keep the elevators operational.

1.3.2 USE OF THE SITE: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.

1.3.2.1 Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times.

1.3.2.2 Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to areas acceptable to Owner. If additional storage is necessary, obtain and pay for such storage off-site.

1.3.2.3 Do not load structure with weight that will endanger structure.

1.3.2.4 Assume full responsibility for protection and safekeeping of products stored on premises.

1.3.2.5 Move any stored products which interfere with operations of Owner or other contractors.

1.3.2.6 Contractor personnel shall utilize only those entrances/exits and parking lots designated by the Owner.

1.3.2.7 Contractor shall utilize only those areas designated by the Owner for the storage of equipment and the placement of dumpsters/transport containers.

1.3.2.8 Take all cautions necessary to ensure there is no universal and hazardous material contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with hazardous materials, the Contractor shall immediately clean them utilizing the wet cleaning and HEPA vacuum methods specified herein. The hazard remediation contractor is responsible for the proper cleanup of all items in the work areas to maintain a clean and safe environment.
SECTION 020810 – UNIVERSAL/HAZARDOUS MATERIALS REMOVAL AND Disposal

1.3.3 CONTRACTOR’S USE OF THE EXISTING BUILDING: Maintain the existing building in a safe and weather tight condition throughout the construction period. Take all precautions necessary to protect the building and its occupants during the construction period.

1.3.3.1 Keep areas such as walkways and stairs free from accumulation of waste material, rubbish or construction debris.

1.3.3.2 Smoking or open fires are prohibited within the building or on the premises.

1.4 OWNER OCCUPANCY

1.4.1 PARTIAL OWNER OCCUPANCY: The Owner reserves the right to occupy areas of the building in which universal/hazardous waste removal has been completed, provided that such occupancy does not substantially interfere with completion of the work. The Owner also reserves the right to occupy portions of the building not involved in this Scope of Work. Such partial occupancy shall not constitute acceptance of the work or any part of the work. The Owner shall also maintain the right to access areas where no universal and Hazardous waste work is being performed.

2.1 SUBMITTAL REQUIREMENTS

2.1.1 The following will be submitted by the contractor prior to commencement of work for approval by Owner’s Certified Industrial Hygienist (one copy for the Owner’s Representative). The Owner’s C.I.H. will return reviewed copies to contractor and Owner’s Representative.

2.1.1.1 One copy of any Safety Data Sheets (SDS) for products to be used by the contractor in the performance of his work. Contractor will also maintain copies of SDS on site per OSHA.

2.1.2 Submit the following for all Supervisor(s) and Workers who will be on the project site prior to commencement of work:

2.1.2.1 A list of project personnel and contact phone numbers

2.1.2.2 Current training certificates, if applicable

2.1.2.3 Physician’s Statement that each person is physically fit to wear a respirator, if respirator use is required

2.1.2.4 Respirator Fit Test, if respirator use is required
2.1.3 Submit a detailed plan of the procedures proposed for use in complying with requirements of this specification. Include in the plan the layout and location of work areas, route of ingress and egress for the work areas, methods used to assure safety of building occupants and visitors, method of removal of material, and disposal container requirements for lead based paint material to be disposed.

2.1.4 Proposed disposal site for lead-based paint materials, including a disposal plan to detail type of disposal container, method of transportation to disposal site, and waste hauler.

2.1.5 Any other submittals as required by MU.

2.1.6 Upon completion of the universal/hazardous material removal, submit to the Owner’s Representative, copies of hazardous materials shipping records, disposal receipts, incineration documentation, etc. for all hazardous materials removed from the project site.

2.1.7 Upon completion of the universal waste/hazardous material removal, the following information shall be submitted by the Owner’s C.I.H. to the contractor:

2.1.7.1 Construction and demolition waste landfill receipts, disposal receipts, truck tickets, incineration/recycling receipts and documentation.

2.1.7.2 Written visual certification from the Owner’s Certified Industrial Hygienist that universal waste/hazardous material have been removed from the facility.

2.2 TERMINOLOGY (Definitions)

2.2.1 APPROVED Construction and Demolition WASTE DISPOSAL SITE: A permitted solid waste landfill that is authorized by the Missouri Department of Natural Resources to receive construction and demolition wastes.

2.2.2 AUTHORIZED VISITOR: The Building Owner, the Building Owner’s representative, MU personnel, or a representative of any regulatory or other agency having jurisdiction over the project.

2.2.3 BARRIER: Any surface that seals off the work area to non-authorized personnel from entering the work area.

2.2.4 BUILDING OWNER: A representative of the University of Missouri.

2.2.5 DISPOSAL CONTAINER: A properly labeled container for universal/hazardous materials. The proposed disposal container for lead-based paint will be provided to the Owner’s Representative and part of the hazard remediation contractor’s pre-work.

2.2.6 HEPA VACUUM EQUIPMENT: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining hazardous particulates. Filters should be of 99.97% efficiency for retaining particulates greater than 0.3 microns.

2.2.7 ON-SITE REPRESENTATIVE: MU’s full-time representative responsible for air monitoring and enforcement of the specifications.
2.2.8 **OWNER’S CERTIFIED INDUSTRIAL HYGIENIST (C.I.H.):** An Industrial Hygienist, certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH).

2.2.9 **HAZARDOUS MATERIAL SHIPMENT RECORD/DISPOSAL RECEIPT:** The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of universal/hazardous materials.

2.2.10 **WET CLEANING/WIPING:** The process of eliminating contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as necessary.

2.2.11 **WORK AREA:** A specific isolated area in which universal/hazardous waste materials are required to be handled. The area is designated as a work area from the time that the area is secured and access restrictions are in place. The area remains designated as a work area until the time that it has been cleaned in accordance with any requirements applicable to the operations conducted.

2.3 **EXISTING CONDITIONS**

2.3.1 Building Owner and Contractor shall agree on building conditions prior to commencement of work. It shall be the Contractor’s responsibility to replace or repair to the Owner’s satisfaction, prior to close-out of the project, all damaged items caused by the Contractor and not proven otherwise. All items damaged prior to remediation shall be noted during preconstruction walk-through.

3.1 **PERSONNEL PROTECTION REQUIREMENTS**

3.1.1 Prior to commencement of work, the workers shall be instructed and shall be knowledgeable on the hazards of the universal hazardous materials involved and other environmental exposures, use and fitting of respirators, protective clothing, decontamination procedures, and all aspects of remediation work procedures; workers shall have medical examinations.

3.1.2 The Contractor acknowledges that he alone is responsible for enforcing personnel protection requirements and that these specifications provide only a minimum acceptable standard for each phase of operation.

3.1.3 If required or requested of the workers, provide workers with personally issued and marked respiratory equipment approved by NIOSH and accepted by OSHA.

3.1.4 No visitors shall be allowed in work areas, except as authorized.

3.1.5 Where required or if requested by the workers, provide workers with sufficient sets of disposable protective full-body clothing. Such clothing shall consist of full-body coveralls, footwear, and head gear, one-piece coveralls or equal. Provide eye protection and hard hats as required by applicable safety regulations. Disposable clothing shall not be allowed to accumulate and shall be disposed of as contaminated waste.

3.1.6 Provide authorized visitors with suitable protective clothing, headgear, footwear, and gloves as described above whenever they are required to enter the work area.
3.2 MATERIALS

3.2.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

3.2.1.1 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

3.2.1.2 Damaged or deteriorating materials shall not be used and shall be removed from the premises.

3.2.2 PLASTIC SHEETING: A minimum 6-mil (or as specified).

3.2.3 TAPE: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water, duct tape, poly prep tapes or approved equal.

3.2.4 ADHESIVES: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

3.2.5 IMPERMEABLE CONTAINERS: Suitable to receive and retain any hazardous materials until disposal by the owners rep. The containers shall be labeled as required by owner. Containers must be resistant to damage and rupture.

3.2.6 WARNING LABELS AND SIGNS: As required by owner.

3.2.7 OTHER MATERIALS: Provide all other materials, such as, but not limited to lumber, plywood, nails, and hardware, which may be required to properly prepare and complete this project.

3.3 TOOLS AND EQUIPMENT

3.3.1 Provide suitable tools for universal/hazardous waste removal and disposal.

3.3.1.1 Water Sprayer: Airless or a low pressure sprayer for amended water application as applicable.

3.3.1.2 Air-Purifying Equipment: High Efficiency Particulate Air Filtration Systems (HEPA) shall comply with ANSI Z9.2-91. No air movement system or air equipment should discharge particulates outside the work area. Thus, the negative air unit shall be equipped with a three filter bank with the last being the HEPA filter capable of removing 99.97% of fibers/particulates >0.3 microns.

3.3.1.3 Scaffolding: As required to accomplish the specified work and meet all applicable safety regulations.

3.3.1.4 Vacuums: Use HEPA type from a known manufacturer.

3.3.1.5 Other tools and equipment as necessary.
3.4 SUPERVISION OF UNIVERSAL/HAZARDOUS Material REMOVAL

3.4.1 The contractor shall designate a competent supervisor subject to the approval of the Owner’s C.I.H. and the Owner’s Representative. The supervisor shall be the Contractor’s representative on the project, shall meet the requirements of all applicable regulations, and perform or meet the following minimum requirements:

3.4.1.1 Be knowledgeable in all aspects of removal, cleanup and proper disposal of universal hazardous materials as listed in the Scope of Work.

3.4.1.2 Be onsite and supervise all removal, cleanup and disposal activities.

3.4.1.3 Maintain a daily log on the project documenting events, violations, problems, equipment failures, accidents, and inspections.

3.4.1.4 Be responsible for implementation of first aid, safety training, respiratory protection, and ensuring all workers are trained in emergency procedures.

3.4.1.5 Be responsible for conducting a visual inspection of the work area prior to a visual inspection by the Owner’s Certified Industrial Hygienist. Inspection shall be documented.

3.5 WORKER PROTECTION / TRAINING

3.5.1 The contractor shall be responsible for providing his employees with proper respiratory protection, respiratory training, a written respirator program, medical examinations, maintaining medical records, protective clothing and equipment to comply with OSHA requirements, if necessary.

3.5.2 All workers shall be trained in the dangers inherent in handling universal waste, and hazardous materials, in proper work procedures, and personal protective measures.

3.6 OWNER’S CERTIFIED INDUSTRIAL HYGIENIST

3.6.1 It will be the Owner’s responsibility to hire a Certified Industrial Hygienist. The Certified Industrial Hygienist will also be required to perform the following duties as a minimum:

3.6.1.1 Approval of the Contractor’s work plan and methods of remediation to meet regulatory requirements and ensure the health and safety of University faculty, staff, and students.

3.6.1.2 Verify that the Contractor is satisfactorily performing the work in accordance with OSHA regulations.

3.6.1.3 Visual inspection of the work areas.

3.6.1.4 Certify in writing that the Contractor’s procedures, methods, and practices were, to the best of his/her knowledge and belief, in compliance with current EPA, OSHA, State, and Local applicable regulations, that the work areas meet the requirements for a final visual inspection prior to re-occupancy, and an accounting of any known deviations.

3.7 SEPARATION OF WORK AREAS FROM NONWORK AREAS

3.7.1 Visual separation shall be accomplished at all "see-through" locations using opaque polyethylene. This separation shall not be incorporated within the other seals involved on this project.
3.8 EMERGENCY PROTECTION PLAN / FIRE EXITS
3.8.1 The contractor shall be responsible for developing a written Emergency Protection Plan and shall maintain this plan onsite. The plan shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, falls, and heat related injury. All employees shall be instructed and trained in the procedures.

3.8.2 The Emergency Protection Plan shall also include written notification of police, fire, and medical personnel of the planned remediation activities, work schedule, and layout of the work area, particularly barriers that may affect response capabilities.

3.8.3 Designate and maintain emergency and fire exits from the work area in accordance with local codes and regulations. All exits shall be clearly marked with fluorescent tape or red paint and shall be clearly visible from any part of the work area.

3.9 LOCAL AREA PROTECTION / SITE SECURITY
3.9.1 The contractor shall secure the work areas to make sure of no inadvertent entry. Any breach to the exterior of the building shall be secured by the hazard remediation contractor. The Contractor shall be responsible for maintaining security of the remediation areas throughout the contract period.

3.9.2 The contractor shall be responsible for all areas of the building used by contractor and/or subcontractors in the performance of the work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the existing building, except such controls as may be specifically reserved to the owner.

3.9.3 Contractor has the right to exclude from the work area all persons who have no purpose related to the work or its inspection, and shall require all persons in the work area to observe the same regulations required of Contractor’s employees.

3.9.4 The contractor shall have control of site security during remediation operations in order to protect the work environment and equipment. Contractor shall have the owner’s assistance in notifying building occupants of impending activity and enforcement of restricted access by owner’s employees.

3.9.5 The contractor shall keep a minimum of two (2) 10lb type ABC fire extinguishers onsite. One shall be maintained outside the work area and one inside each work area. Contractor employees shall be trained in the operation of fire extinguishers.

3.9.6 The contractor shall maintain the work area free from rubbish, debris, and dirt, and keep a clean, safe working area.

3.10 UNIVERSAL WASTE/HAZARDOUS MATERIALS REMOVAL OPERATIONS
3.10.1 Any light fixtures, housings, etc. concealing items considered to be universal waste/hazardous material shall be removed, containerized, labelled, and left on site for disposal by MU EHS. This does not include refrigerant or CHC/HFC-containing equipment which are being replaced by the contractor. It does not include TCLP ceramic tile, which should be handled by the contractor.
3.10.2 **MATERIALS PAINTED WITH RCRA-Metals PAINT** –
It is anticipated that these items will be removed as part of the demolition process and will be segregated from the remainder of the demolition debris. It is anticipated that these items will be hauled away and disposed of in a sanitary landfill approved by the State of Missouri to accept construction and demolition waste. These areas should be sealed off with polyethylene sheeting over the doors, vents, windows, or any other openings into/out of the area.

3.10.3 **FLUORESCENT LIGHT TUBES** may contain small amounts of Mercury. This can potentially be harmful to human health and the environment. The bulbs should be placed in fiberboard boxes provided by MU EHS to minimize breakage. MU EHS will manage disposal of this material.

3.10.4 **POLYCHLORINATED BIPHENYL (PCBS)** are a known carcinogenic material. Its use was discontinued January 1, 1979. Due to the age of the building, it should be assumed that any ballast can contain PCBs unless it is labeled as PCB free by the manufacturer. Due to this, any light ballasts presumed to contain PCBs should be properly disposed of. MU Environmental Health Safety will provide collection container for this purpose. Non-PCB ballasts will also be managed by MU Environmental Health Safety. Collection containers will be provided to the contractor upon their request.

3.10.5 **SMOKE DETECTORS** are typically ionization smoke detectors that may contain a small amount of radioactive material. MU Environmental Health and Safety will provide collection containers for this material and will also be responsible for the disposal of this material.

3.10.6 **FIRE ALARMS (STROBE LIGHT)** are typically not considered a universal or hazardous waste. However, for the purposes of this project, these items should be collected by the contractor and managed by MU Environmental Health and Safety. Collection containers will be provided to the contractor upon their request.

3.10.7 **EXIT SIGNS AND EMERGENCY LIGHTS** typically have backup batteries that may contain small amounts of lead. Some exit signs are powered by a small amount of radioactive material. Powered exit signs and emergency lights should have the battery removed and disposed of by MU Environmental Health and Safety. Non powered exit signs should be assumed to contain radioactive material and should be collected for disposal via MU Environmental Health and Safety. MU Environmental Health and Safety will provide collection containers for these items.

3.10.8 **DRINKING FOUNTAINS**: Some drinking fountains have reservoirs that may contain lead and a CFC/HCFC refrigerant that must be recovered. The lead reservoirs should be removed and recycled. The CFC/HCFC refrigerant must be recovered by a contractor licensed and trained in this type of work. The remainder of the unit should be managed as scrap metal.

3.10.9 **DOOR CLOSURES**: Some of the older door closures have oil reservoirs for lubrication. These oils may contain small amounts of PCBs. MU Environmental Health and Safety will provide a collection container for this material, and will be responsible for disposal.

3.10.10 **THERMOSTATS** may contain Mercury. This can potentially be harmful to human health and the environment. Mercury containing thermostats shall be disposed of as a hazardous waste. MU EHS will provide a collection container for this material, and will be responsible for disposal.
3.10.11 **WINDOW AIR CONDITIONING UNITS**: Where possible, these window units should be removed and stored for use elsewhere. Otherwise these units may contain CFC/HCFC refrigerants that must be recovered. CFC/HCFC refrigerants are suspected to damage the atmosphere. The CFC/HCFC refrigerant must be recovered by a contractor licensed and trained in this type of work. The remainder of the unit should be managed as scrap metal.

3.10.12 **CERAMIC TILE**: are made from clay bodies that contain high concentrations of silica. Respirable crystalline silica is a “known human carcinogen.” When ceramic tiles are cut, abraded, shattered, or crushed, hazardous silica dust can be generated. Ceramic tiles can also have high concentrations of toxic metals, in the clay body and in the glazing, and potentially be classified as Hazardous Waste. The ceramic tiles will need to be collected, containerized by the contractor, and picked up by MU EHS.

3.12 **REESTABLISHMENT OF THE WORK AREA**

3.12.1 Reestablishment of the work area shall only occur after the Contractor has received a final visual inspection from the Owner’s C.I.H. documenting that the universal/hazardous waste materials have been removed from the project site.

END OF SECTION