

ADDENDUM No. 1

ITB No. 4553

WATER TREATMENT PLANT 2018 ARCHITECTURAL AND STRUCTURAL REPAIRS

Bids Due: December 13, 2018 at 2:00 P.M. (Local Time)

The following changes, additions, and/or deletions shall be made to the Invitation to Bid for Water Treatment Plant 2018 Architectural and Structural Repairs, ITB No. 4553, on which bids will be received on/or before December 13, 2018, at 2:00 P.M. (local time).

The information contained herein shall take precedence over the original documents and all previous addenda (if any), and is appended thereto. **This Addendum, including attachments, includes twenty (20) pages.**

Bidder is to acknowledge receipt of this Addendum No. 1, including all attachments (if any) in its Bid by so indicating on page ITB-1 of the Invitation to Bid Form. Bids submitted without acknowledgment of receipt of this addendum will be considered nonconforming.

The following forms provided within the ITB document must be included in submitted bids:

- City of Ann Arbor Prevailing Wage Declaration of Compliance
- City of Ann Arbor Living Wage Ordinance Declaration of Compliance
- Vendor Conflict of Interest Disclosure Form
- City of Ann Arbor Non-Discrimination Ordinance Declaration of Compliance

Bids that fail to provide these completed forms listed above upon bid opening will be rejected as non-responsive and will not be considered for award.

I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the Bid document which are outlined below are referenced to a page or Section in which they appear conspicuously. The Bidder is to take note in its review of the documents and include these changes as they may affect work or details in other areas not specifically referenced here. Changes to the original text are bolded and italicized.

<u>Section/Page(s)</u>	<u>Change</u>
Table of Contents, TC-2	ADD <i>Section 02 82 13 – Asbestos Remediation and Abatement</i> ADD <i>Section 02 83 19 – Lead Based Paint Remediation</i>
Table of Contents, TC-5	ADD <i>Section 26 05 53 – Identification for Electrical Systems</i>
BF-5	Base Bid #1, Item 4.12, Revise Description: Remove section of masonry parapet wall to underside of roof deck as indicated on Drawing E-4c <i>and RP-1A (GN-7)</i> ; provide interior finish work as necessary.

- BF-6 Base Bid #1, Item 7.6, Revise Description:
Roofing Replacement at Filter Gallery – Roof Areas F-2 & ~~F-3~~ F-5.
- BF-6 Base Bid #1, Item 7.7, Revise Description:
Roofing Replacement at Filter Gallery – Roof Areas F-1, ~~F-3~~, F-4, ~~F-5~~, F-6 & F-7.
- BF-14 Insert the attached BF-14-ADD in its entirety. Complete and submit as part of the Bid.
- Comment: The intent with this change is to simply insert the additional Page BF-14-ADD after Page BF-14 of the ITB Document.*
- 02 82 13 ADD Specification 02 82 13 – Asbestos Remediation and Abatement
- 02 83 19 ADD Specification 02 83 19 – Lead Based Paint Remediation
- Drawing E-0 Restoration Note R6 references the wrong detail. Make the following CHANGE:
RESTORE EXISTING STEEL LINTEL AND PROVIDE NEW THROUGH-WALL FLASHING IN ACCORDANCE WITH DETAIL 1/~~RSD-3~~ AND SPECIFICATIONS.

II. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the ITB. Offerors are directed to take note in their review of the documents of the following questions and City responses as they affect work or details in other areas not specifically referenced here.

Question 1: The masonry restoration quantities for Items 4.1.1, 4.2 and 4.2.1 do not agree with the tabular values in Sheets E-0.1.

Answer 1: The values on E-0.1 were the based on the evaluation and design phases. These allowable quantities were slightly increased in the Bid Form to account for additional unknowns in the areas of masonry distress in the older (1938) wall systems. **Bids submitted shall be based on the quantities in the Bid Form.**

Question 2: Please specify the basis for design or manufacturer for the interior cabinetry.

Answer 2: The cabinets are to be custom cabinetry, per the project manual, section 06 41 00. See Section 06 41 00, paragraphs 2.01 through 2.05 for additional information and requirements related to the custom cabinetry construction.

Respondents are responsible for any conclusions that they may draw from the information contained in the Addendum.

END OF ADDENDUM

INSTRUCTIONS: Please insert this page behind Page BF-14 and include with Bid.

Unit Price Bid

L. Unit Pricing

5. Asbestos Remediation Unit Prices shall be provided in accordance with the procedures specified (including labor, material, overhead, profit and taxes) to abate the following existing asbestos containing materials. See Section 02 82 13, paragraph 3.7, for approximate quantities. These unit prices will be used in tracking against the Hazardous Material Remediation Allowance in Base Bid #1:

a. Chemical Building

Exterior Lintel Caulk	\$ _____	/LF
Exterior Sill Caulk	\$ _____	/LF
Exterior Window Glaze	\$ _____	/LF

b. Filter Gallery

Exterior Window Caulk (Cream)	\$ _____	/LF
Exterior Window Glaze (Black)	\$ _____	/LF
Interior Window Caulk (Tan)	\$ _____	/LF
Roof Window Glaze (Black)	\$ _____	/LF
Roof Window Glaze (Gray)	\$ _____	/LF
Roof Window Frame Caulk (Tan)	\$ _____	/LF

c. Calciner Building

Exterior Window Frame Caulk (Gray)	\$ _____	/LF
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d. S. Industrial Pump Station

Interior Door Caulk (White)	\$ _____	/LF
Interior Window Caulk	\$ _____	/LF
Exterior Window Caulk (Gray)	\$ _____	/LF

e. North Campus Pump Station

Exterior Wall Joint Caulk (Gray)	\$ _____	/LF
Exterior Vent Caulk (Gray)	\$ _____	/LF

SECTION 02 82 13

ASBESTOS REMEDIATION AND ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes removal and disposal of asbestos-containing materials by full enclosure, glove bag, or entire structures methods as applicable. Demolition and debris removal of all asbestos-containing materials identified by provisions of this Section, or shown on drawings, or identified at the site, shall be executed under the provisions of this Section, and other applicable sections of these specifications.
- B. Extent of asbestos removal work is as follows:
 - 1. Surveyed and listed in "Schedule of Items Containing Asbestos" Article in Part 3 of this Section, as specified in related sections, and as indicated on the drawings. Proceed with Work of this Section simultaneously, and in coordination with, remaining Work of the Project.

1.2 DEFINITIONS

- A. Asbestos Abatement Firm: Firm engaged to perform actual removal and disposal work, either as Contractor or subcontractor.
- B. Asbestos Containing Material: The term "asbestos containing material" is abbreviated ACM.
- C. Owner's Consultant: Firm engaged by Owner to identify and measure asbestos containing materials, or to inspect demolition operations, including monitoring of air quality.

1.3 SUBMITTALS

- A. Initial Submittals: Submit the following documents to Owner's Representative at the pre-abatement meeting:
 - 1. License from the State of Michigan in accordance with Act 135 P.A. 1986 (Asbestos Abatement Contractors Licensing Act).
 - 2. Copy of notification sent to appropriate federal, state, and local agencies.
 - 3. Schedule of removal, specifying work locations, length and number of shifts, foreman's name, and crew size.
- B. Waste Disposition Submittals: Submit to owner signed waste shipment record stating that asbestos waste has been properly disposed. Submit the following:
 - 1. Receipts (trip tickets) from approved landfill.
 - 2. Asbestos Waste Shipment Record: As follows:
 - 1. Prior to removing asbestos-containing material from the project site, provide Owner's Representative or Owner's consultant with a completed waste shipment record fully complying with Section 61.150 of the NESHAP standard, and 49 CFR Part 172.200 of the U.S. Department of Transportation, and including all required information.
 - 2. Ensure that the landfill operator provides a signed copy of the waste shipment record to owner within 35 days of the date that asbestos-containing material is removed from the project site. If waste is not transported directly from the project site to the landfill, the waste shipment record shall reflect each transfer.
 - 3. The Owner will not make final payment prior to receipt of signed waste shipment record.

1.4 QUALITY ASSURANCE

- A. Engage one of the following firms to perform abatement of asbestos containing materials:
1. Adrian Environmental, LLC
 2. Certified Abatement Services, Inc.
 3. Environmental Maintenance Engineers, Inc.
 4. Environmental Specialty Services, Inc.
 5. Great Lakes Environmental Service, Inc.
 6. MIS Corporation-Michigan
 7. Next Generation Environmental, Inc.
 8. Pro-Tech Environmental, Inc.
 9. Professional Thermal Systems, Inc.
 10. Quality Environmental Services, Inc.
 11. Sloan Environmental Services, Inc.
 12. Trust Thermal Abatement, Inc.
- B. Regulatory Requirements: Make all necessary notifications to the appropriate federal, state, and local agencies.
1. The National Emission Standards for Hazardous Air Pollutants (NESHAP), Asbestos regulation 40 CFR 61, Sub-Part M requires that if at least 80 lin. meters (260 lin. ft.) of friable asbestos materials, at least 15 sq. meters (160 square feet), or 1 cu. meter (35 cu. ft.) of friable asbestos materials, or other facility components are stripped or removed while renovating a facility, all the requirements of section 61.147 apply.
 2. When applicable, notify the Michigan Department of Environmental Quality (MDEQ), the Michigan Department of Licensing and Regulatory Affairs (MDLARA), and appropriate state and local regulatory agencies. No work shall be conducted without notification of authorities having jurisdiction.
- C. Pre-Abatement Meeting: Approximately 2 weeks prior to scheduled start of the abatement project, the Owner's Representative will hold a pre-abatement meeting with the individuals indicated below:
1. Contractor representative.
 2. Asbestos Abatement Firm's representative.
 3. Owner's consultant.
 4. Owner's Representative.
 5. Owner's building maintenance personnel.
- D. The meeting agenda will include:
1. Review of the scope of work.
 2. Removal methods to be used.
 3. Review of Contractor's initial submittals.
 4. A walk-through survey of the site, if appropriate.
- E. For small projects, the meeting may be suspended at the discretion of the Owner's Representative. If the meeting is suspended, deliver required initial submittals to the Owner's Representative's office 2 weeks prior to the start of work.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 ASBESTOS ABATEMENT, GENERAL

- A. Conduct asbestos abatement operations in a manner that fully protects Contractor's and subcontractor's employees, the general public, and building occupants from exposure to asbestos and other safety and health hazards.
 - 1. Asbestos abatement projects shall be directly supervised by a competent person as described in 29 CFR 1926.1101.
 - 2. The supervisor/competent person must complete responsibility checklists throughout all phases of the project.
- B. Protect adjacent areas, materials and surfaces from damage due to demolition operations, including but not necessarily limited to the following:
 - 1. Water damage.
 - 2. Dirt, dust and debris.
 - 3. Abrasion.
 - 4. Cuts and scratches.
 - 5. Holes from fasteners for temporary barriers.
- C. All asbestos work shall be conducted within a regulated area that complies with the following requirements:
 - 1. Post a sufficient number of signs required by 29 CFR 1926.1101 at the asbestos abatement area and at every work area entrance, so that tenants, Owner's personnel, and other contractor's employees have an opportunity to take protective measures before exposing themselves to asbestos. Place banners if necessary to secure open areas. Include information on signs indicating location and quantity of asbestos-containing material.
 - 2. Allow only authorized, properly protected personnel to enter the regulated area. Immediately report unauthorized individuals entering the work area to Owner or the Owner's consultant.
- D. When required, provide employees and inspectors authorized to enter the regulated area with protective work clothing consisting of disposable Dupont "Tyvek" (or equivalent) full body coveralls, head covers, boots, and other necessary safety gear, including a hard hat and eye protection.
- E. Provide respiratory protection to employees as required by current OSHA regulations including 29CFR 1910.134 and 1926.1101.
 - 1. Provide asbestos abatement workers with powered air purifying respirators (PAPR) with full facepiece and HEPA filters for adequate protection during asbestos material removal operations. Respiratory protection may be down-graded if negative exposure assessment indicates that less protection is required.
 - 2. A half-face respirator or PAPR must be worn while tearing down and setting up enclosures, while glovebagging, and during pre-cleaning and post-cleaning work.
 - 3. Do not allow respirators to be pulled away from faces while in the work area.
 - 4. Maintain an extra PAPR unit on site at all times for the duration of the abatement project.
 - 5. Provide full facepiece supplied-air respirators operated in pressure demand mode equipped with air auxiliary and pressure self-contained breathing apparatus or HEPA egress filters if required for measured fiber concentrations.
- F. Maintain at each job site and post the following documents:

1. Copy of MDEQ/MDLARA notification.
 2. Employee respiratory protection program.
 3. Michigan Right-To-Know poster.
 4. Material Safety Data Sheet locator.
 5. Company standard operating procedure.
 6. This specification Section.
 7. Material Safety Data Sheets for products used on job.
 8. CFR 1926.1101.
 9. CFR, Part 61 (NESHAP).
 10. The foreman's or supervisor's Contractor/Supervisor Accreditation Certificate.
 11. State of Michigan Accreditation Certificates and Medical Approval for each worker.
- G. Use the following engineering controls and work practices for all asbestos abatement operations, regardless of measured exposure levels:
1. Vacuum cleaners equipped with HEPA filters to collect all asbestos-containing dust and debris.
 2. Wet methods to control exposures during asbestos removal and clean-up, except where proven to be infeasible.
 3. Prompt clean-up and disposal of asbestos-contaminated wastes and debris in leak-proof containers.
 4. Establish a decontamination area, adjacent and connected to the regulated area, if the Project requires the removal of more than 25 lin. ft., or 10 sq. ft. of thermal systems insulation or surfacing ACM.
 5. Establish an equipment area adjacent to the regulated area if the Project requires the removal of less than 25 lin. ft. or 10 sq. ft. of thermal systems insulation or surfacing ACM.
- H. Do not use any of the following equipment or work practices during asbestos abatement operations, regardless of measured exposure levels:
1. High-speed abrasive disc saws not equipped with point-of-cut HEPA ventilation or HEPA filtered exhaust air enclosures.
 2. Blowing with compressed air to remove asbestos-containing materials.
 3. Dry sweeping, shoveling, or other dry methods to clean up asbestos-containing dust and debris.
 4. Employee rotation as a means of reducing employee exposure to asbestos.

3.2 ASBESTOS REMOVAL BY FULL ENCLOSURE METHOD

- A. Preparation of the Work Area: Complete the following preparation work prior to beginning asbestos removal operations:
1. Install critical barriers over each opening into the regulated area. The following requirements are in addition to, not in lieu of, other indicated surface and object protection requirements:
 1. Seal each opening between the work area and adjacent areas with not less than 2 layers of 4-mil polyethylene sheeting. Use an expanding-polyurethane foam gun to seal areas with large numbers of pipes, conduits and beams. Openings include, but are not necessarily limited to, windows, skylights, doorways, elevator hoistway openings, corridor entrances, drains, ducts, grills, grates, and diffusers.
 2. Seal intake and exhaust vents and duct seams within the regulated area with not less than 2 layers of 6-mil polyethylene sheeting.
 2. HVAC System Shutdown: Owner's maintenance personnel will shut down heating, cooling, and air conditioning systems when necessary. Coordinate scheduling with Owner's personnel and provide 72 hours notice to the Owner's Representative prior to planned shut-down.

3. Protection of Surfaces and Objects: The following requirements are in addition to, not in lieu of, indicated work area sealing requirements. Cover the following surfaces and objects as follows:
 1. Protect all surfaces beneath all removal activity. Remove moveable objects from the work area, and cover fixed objects with impermeable dropcloths or plastic sheeting with edges securely sealed with tape.
 2. Cover open tanks with plywood or other solid material.
 3. Provide clean, fresh air to mechanical equipment, where required to maintain proper performance of equipment.
 4. Fully pre-clean all covered surfaces with amended water and a HEPA vacuum.
 5. Cover walls with not less than 2 layers of 4-mil polyethylene sheeting. Construct free-standing enclosure walls of not less than 6-mil polyethylene sheeting, with supports spaced not more than 3 feet o.c.
 6. Cover floors with not less than 2 layers of 6-mil polyethylene sheeting. Avoid seams where possible. If seams are necessary, overlap not less than 12 inches and tape joints. Extend sheeting 12 inches up the side walls leaving no seams at the wall and floor joint. Immediately repair punctures and leaks, and clean up seepage.
4. Cleaning: Do not use cleaning methods that raise dust, such as sweeping or using vacuum cleaners not equipped with HEPA filters. Do not disturb asbestos materials during pre-cleaning phases.
 1. Treat water removed from the enclosure as asbestos contaminated waste. Fully seal floor drains.
5. Deactivate or install ground-fault circuit interrupters on each electrical circuit within the enclosure.
6. Construct a three-chambered decontamination facility that is adjacent to and connected to the regulated area, and that consists of a dirty room, a shower room, and a clean room in series. Construct decontamination facilities that are exposed to weather of lumber and exterior grade plywood. Secure the facility when not in use.
 - 1) Supply the equipment room with properly labeled, impermeable bags and containers for the containment and disposal of contaminated protective equipment.
 - 2) Construct showers that comply with the requirements of 29 CFR 1910.141 (d) (3), with the shower room adjacent to both the equipment room and the clean room. Filter water waste and shower water through a 5 micron filter, or remove water from site as asbestos waste.
 - 3) Equip the clean room with a locker or appropriate storage container for each employee.
7. Employee Decontamination Facilities: Comply with the following requirements:
 1. Access the work area only through an approved decontamination system. Lock or block other entrances. Seal emergency exits (for use during a fire or accident) with polyethylene sheeting and tape.
 2. Seal the waste pass-out, except during the removal of asbestos waste from the enclosure.
 3. Entrance To The Regulated Area: Employees shall enter the decontamination area through the clean room, remove and store clothing, and put on protective clothing and respiratory protection before passing through to the equipment room.
 4. Exit From The Regulated Area: Employees shall exit the regulated area by removing gross contamination and debris from their protective clothing. The clothing shall be removed and disposed of in the equipment room into labeled impermeable bags or containers. Employees shall then shower and enter the clean room before changing into street clothes.

8. Local Exhaust Ventilation: Maintain portable air filtration units with a HEPA filter in use during asbestos abatement operations requiring enclosures. Units shall conform to OSHA Standard 1926.1101, Appendix F, and shall be designed in accordance with 40 CFR 61, Subpart M, Section 61.153.
 1. Exhaust directly to building exterior. Provide a backup portable air filtration unit at each removal enclosure. Start up ventilation units prior to initiating asbestos removal operations and run until the Owner's consultant has approved their shut-down after cleaning, sampling, visual inspection, and tear-down.
 2. Direct air movement within the enclosure away from the employees' work area and toward the air filtration device.
 3. Provide not less than 4 air changes per hour within the enclosure.
 4. Within the enclosure, through the period of its use, maintain a pressure differential of not less than minus 0.02 water gage with respect to ambient conditions outside the enclosure.
 9. Visually inspect the enclosure for breeches and smoke-test for leaks before work begins, and before the start of each work shift. Make all modifications to the enclosure prior to starting removal work.
- B. Asbestos Removal Operations: Comply with the following requirements for asbestos removal operations:
1. Immediately preceding asbestos removal, apply a fine mist of amended water (water and wetting agent) to the asbestos materials and the surrounding area. Keep surrounding areas wet by spraying periodically with amended water. Maintain a high humidity environment to assist in fiber settling.
 2. Remove asbestos material using two-person teams, on staging platforms, if necessary.
 3. Remove the wet asbestos material as intact sections or components. Carefully lower the material to the floor or place directly into container. Never drop or throw asbestos material on the floor.
 4. At working heights between 15 and 50 feet above the floor, place removed asbestos materials in containers at the elevated levels and lower to floor, or place onto inclined chutes or scaffolding for subsequent collection and placement into containers. Clean all debris at the completion of each workday.
 5. Once the asbestos material is at ground level, pack in labeled 6-mil polyethylene bags, wet and, if appropriate, hold in drums prior to starting the next section.
 6. Use 2 sealed and labeled 6-mil thick bags for storage and transportation of asbestos waste. Standing water shall be in each bag
 7. Wrap large components removed intact in two layers of 6-mil polyethylene sheeting, label, and secure with tape for transport to the landfill. Comply with all wetting requirements.
 8. Treat wires, hangers, steel bands, nails, screws, metal lath, tin sheeting, and similar sharp objects removed with asbestos material as asbestos waste. Place in drums for disposal.
 9. Label containerized asbestos waste in accordance with OSHA, EPA, and Department of Transportation regulations, as follows:
 1. Label each container with OSHA label that contains the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG
DISEASE HAZARD
 2. Label each container with Owner's and Asbestos Abatement Firm's names and addresses as required by NESHAP. Owner's address is 301 E. Huron, Ann Arbor, MI 48104.

3. Label each container with Class 9 Label required by DOT and identify waste as "RQ, Asbestos NA 2212."
 10. Prepare a complete and accurate NESHAP Waste Shipment Record (special manifest). Assure all information required by the U.S. Department of Transportation regulation is included. Under "special handling instructions" provide the required DOT identification information: RQ Asbestos 9,NA 2212, PG III.
 1. Do not remove waste from site until Owner's Representative has signed and verified the shipment record.
 11. Remove containerized asbestos waste daily from site, or store on site in a locked or secured location until ready for final disposal. Obtain approval of Owner's Representative of the location of disposal containers. Outdoor waste containers shall be fully enclosed and locked. Mark vehicles used to transport waste during the loading and unloading of asbestos waste with a visible sign, as required by NESHAP.
 12. Each container shall have excess water evident, or the asbestos waste shall be mixed in a slurry.
- C. Post-Removal Operation Requirements: After completion of asbestos removal and clean-up operations, comply with the following requirements:
1. The Asbestos Abatement Firm representative, in presence of Owner's consultant, shall inspect the entire work area for asbestos. Include decontamination unit, all plastic sheeting, seals over doorways, windows, and all other openings.
 1. If any suspect asbestos is found, repeat final cleaning operation, until the visual inspection is satisfactory to the Owner's consultant and the asbestos removal firm. Asbestos not scheduled to be removed as part of the project is exempt.
 2. Encapsulate all walls, floors, ceilings, other exposed surfaces, and decontamination facilities after completing the work area inspection.
 1. Remove the inner polyethylene barrier that is not integral to maintaining negative pressure in the enclosure at this time, and post-abatement air samples will be collected by Owner's consultant. Immediately clean any asbestos-containing materials observed behind these secondary barriers.
 3. When post-abatement fiber levels are greater than either 0.01 fiber/cc or background level, repeat cleanup operation until the area is below either 0.01 fibers/cc or background level.
 4. When the post-abatement samples are in compliance, and the Owner's consultant has completed the visual inspection, the enclosure shall be removed.
 1. Turn off HEPA filter exhaust units only after all barriers have been removed.
 2. A final visual inspection will then be conducted by the Owner's consultant before the Contractor is released from the removal site. The final inspection will include tape, polyethylene sheet, debris, and equipment.

3.3 REMOVAL BY NEGATIVE PRESSURE GLOVE BAG SYSTEMS

- A. Equipment and Materials: Use the following equipment and materials for each glovebag procedure:
1. Glovebags fabricated of 6-mil thick plastic without seams at the bottom.
 2. HEPA vacuum system attached to the glovebag and run continuously during operation.
 3. Protective suits and respirators.
 4. Plastic sheeting.
 5. Wetting agent.
 6. Encapsulant.
- B. Procedures: Comply with the following glovebag method requirements:
1. Wrap loose and friable material adjacent to the removal area in 2 layers of 6-mil thick plastic, or otherwise render intact.

2. Place plastic sheeting on the floor and equipment beneath each glovebag.
 3. Wet-wipe or HEPA vacuum dust and dirt from insulation to be removed.
 4. Install glovebags to completely cover the circumference of pipe or other structure where work is to be done.
 5. Smoke-test glovebags for leaks. Seal leaks prior to use.
 6. Insert and seal equipment that penetrates the bag (spray wands, vacuum nozzles) before insulation is disturbed.
 7. Wet the insulation to be removed before, during, and after the removal.
 8. Provide only bags capable of withstanding constant wetting and evacuation through a HEPA filtered device.
 9. During the performance of glovebag operations removing thermal systems, insulation, or surfacing materials, employ not less than 2 persons, working simultaneously, for each task.
 10. Wipe insulation residue from the pipe prior to application of an encapsulant.
 11. Spray the pipe and glovebag with an encapsulant before the bag is removed from the pipe.
 12. Seal exposed insulation ends with a heavy grade mastic.
 13. Follow glovebag manufacturer's instructions.
 14. Comply with requirements for asbestos waste disposal indicated in "Removal by Full Enclosure Method" of this Section.
- C. Unacceptable Conditions and Procedures and Conditions: In general, do not use the glovebag method in conditions that prevent safe completion of the removal process. The following procedures are not allowed during glovebag removal:
1. Removing severely damaged insulation.
 2. Overloading glovebag.
 3. Sliding or moving insulation or glovebag along pipe.
 4. Squeezing bags to remove air.
 5. Placing glovebags on pipes or other surfaces that exceed 150 deg. F.
 6. Using a glovebag more than once.

3.4 REMOVAL BY ENTIRE STRUCTURES METHOD

- A. The removal of entire structures without disturbing the asbestos is encouraged. An example is removal of asbestos covered pipe fittings by cutting out the entire pipe section scheduled for demolition.
1. Obtain Owner's Representative's approval of removal by entire structures method prior to starting the project.
- B. Required Procedures: Comply with the following requirements applicable to removal of entire structures:
1. Properly wet all asbestos materials before starting procedure. Ensure that material stays adequately wet throughout the entire procedure by continuing application of water as needed.
 2. Properly and fully wrap and label the structure before it is moved or cut out.
 3. Provide the equipment necessary for asbestos debris cleaning on site during the procedure.
 4. Comply with requirements for asbestos waste disposal indicated in "Removal by Enclosure Full Method" Article of this Section.

3.5 FIELD QUALITY CONTROL

- A. Pre-Notification of Owner's Representative: To permit adequate time to schedule air monitoring, notify the Owner's representative not less than 10 calendar days prior to planned start of all removal operations.

- B. Air Monitoring: Except for roofing removal work Owner will retain a professional independent industrial hygiene consultant to collect air samples and oversee the project to insure that compliance with applicable codes, regulations, and ordinances, including 29 CFR 1926.1101, NESHAP, and P.A. 135. The consultant will collect background, contiguous, work area, personal, and post-abatement air samples. Owner will provide one copy of the report to the Contractor if requested.
 - 1. If contiguous sampling indicates airborne fiber concentrations above 0.01 fibers/cc or background level, work will be stopped unless otherwise approved by Owner. Work may resume when the source of contamination has been corrected and the contamination has been cleaned to the satisfaction of the Owner.
 - 2. Glovebag, entire structures, and full enclosure clearance sampling will be by the aggressive PCM method when feasible. Enclosures must be fully dry before sampling.
 - 3. Roofing removal Contractors may provide their own air monitoring in compliance with roofing removal requirements of this Section.
- C. Inspection: If during the project, Owner's representative or Owner's consultant determines that work practices either violate applicable rules and regulations or endanger employees, the Contractor's on-site representative shall stop operations immediately and take corrective action. Cooperate fully with Owner's representative and Owner's consultant.

3.6 REMOVAL OF NON-FRIABLE ASBESTOS-CONTAINING MATERIALS

- A. Removal of Non-Friable Materials, General: For each type of non-friable asbestos-containing material indicated, comply with the following requirements:
 - 1. Comply with requirements of Article 3.1 of this Section.
 - 2. Conduct non-friable material removal operations to prevent the material from becoming friable during the removal and disposal process. No visible emissions are permitted. If the material does not remain substantially intact, comply with the requirements for friable asbestos removal specified in Articles 3.2 of this Section (except roofing removal).
 - 3. Place impermeable drop cloths on surfaces beneath removal activity.
 - 4. Do not conduct asbestos removal unless the Owner's Consultant is present at the site and Owner has been notified. For roofing removal projects, notify Owner prior to start of work.
 - 5. Labeling Containerized Waste: Comply with the requirements of Article 3.2, paragraphs B.9.a. through c. of this Section.
- B. Removal of Resilient Flooring Materials:
 - 1. Prior to removal, critical barriers shall be placed over openings to the regulated area. During removal, air in the regulated area shall be filtered through the use of air filtration device(s).
 - 2. Removal of floor tile with an infrared heat machine eliminates the critical barrier and negative pressure requirements.
 - 3. Prior to removal, clean floors of dirt and debris with vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (brush tools are not permitted). Control odors and fumes with engineering controls.
 - 4. Sanding the floor or related backing is not permitted.
 - 5. Mechanical chipping of vinyl floor tile is prohibited, except when performed in a negative pressure enclosure.
 - 6. Thoroughly wet vinyl floor tile with amended water. Use a slip scraper or equivalent to loosen the floor tile from the floor. Remove the floor tile in an intact state. Keep the floor tile wet throughout the removal and cleanup.
 - 1. Removal of floor tile using an infrared heat machine eliminates the wetting requirement.

7. Remove vinyl sheet flooring by cutting while wetting the snip-point. Wet sheet flooring during delamination. Rip-up of resilient flooring material is not permitted.
 8. Clean resilient flooring of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent and allow time to dry. Dry sweeping is prohibited.
 9. Place the resilient flooring material and debris in an asbestos disposal bag. Seal the bag and place it in a properly labeled drum or polypun bag. Comply with the disposal and labeling requirements of this Section.
- C. Asbestos Mastic Removal:
1. Clean the floor of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent.
 2. Remove as much mastic as possible using a solvent. Control odors and fumes with engineering controls.
 3. Perform scraping of residual adhesive and backing using wet methods.
 4. After all debris is removed, thoroughly mop the floor and allow time to dry.
 5. If shot blasting is used to remove mastic, comply with requirements for friable asbestos removal specified in Article 3.2 of this Section.
 6. Properly dispose of all asbestos and solvent waste according to all applicable regulations, and comply with the disposal and labeling requirements of this Section.
- D. Asbestos-Containing Siding, Transite Panels, and Laboratory Counter Tops: Remove non-friable asbestos-containing siding, shingles, transite panels, and laboratory counter tops using the following technique:
1. Cutting, abrading, or breaking material is not permitted.
 2. Wet material with amended water prior to removal.
 3. Carefully disassemble material such a manner as to prevent breakage.
 4. Wrap and seal material in two layers 6-mil thick polyethylene, asbestos disposal bags, or equivalent. Seal bags or packages and properly label them with appropriate asbestos warning signs as indicated in "Removal of Non-Friable Materials, General" Article of this Section.
 5. Immediately lower to the ground unwrapped or unbagged materials via covered, dust-tight chute, crane, or hoist; or place in an impervious waste bag or wrap in plastic sheet and lower to the ground no later than the end of the work shift.
 6. Clean the floor of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent and allow time to dry.
 7. Dispose of asbestos waste in accordance requirements of this Section.
- E. Non-Friable Asbestos-Containing Roofing Materials: Non-friable asbestos-containing roofing materials may be removed in a non-friable state. This specification does not apply to removal of intact cements, coatings, or mastics. Remove non-friable asbestos-containing roofing materials in using the following technique:
1. Each employee who is likely to disturb or handle asbestos material shall have completed an 8-hour training class, and the project shall be supervised by a competent person who has completed the appropriate contractor/supervisor course.
 2. Isolate roof level heating and ventilation air intake sources within the regulated area and others that will be affected; or arrange for shut-down the affected ventilation system during removal operations. Acceptable isolation techniques include the following:
 1. Use 20-foot or larger buffer zones.
 2. Installation of HEPA filters over the air intakes.
 3. Erection of horizontal or vertical extensions that relocate the opening of the intake outside or above the regulated area.
 4. Covering the intake with plastic sheeting or other appropriate barrier.

3. Personal protective equipment (PPE), including disposable coveralls and NIOSH approved appropriate high efficiency particulate absolute (HEPA) respirators, shall be worn by personnel if the asbestos containing material is not removed in an intact state.
 4. Remove roofing material in an intact state.
 5. Use wet methods to remove materials that are not intact, or that are rendered not intact during removal, except where wet methods will create a safety hazard or are otherwise not feasible.
 6. Continuously apply a water mist to the blade of power cutting tools, unless a competent person determines that misting will substantially decrease worker safety.
 7. When removing roofing felts, collect the dust generated by power roof cutters with a HEPA-filtered dust collector; or immediately vacuum using a HEPA-filtered vacuum along the cut line. For smooth surfaces only, gently sweep wet dust generated from cutting operations, and carefully and completely wipe up the still-wet dust and debris.
 8. For removal and repair operations of intact roofing less than 25 sq. ft. in area, the use of wet methods or HEPA vacuuming is not required, provided manual methods do not render the material non-intact and no visible dust is created.
 9. Do not drop or throw to the ground asbestos-containing roofing material that has been removed. As soon as practicable, but not later than the end of the work shift, lower debris to ground either by passing or carrying by hand, or by lowering to the ground in a covered, dust-tight chute, crane or hoist.
 1. While on the roof, keep non-intact asbestos-containing materials wet; or seal in impermeable waste bags, or wrap in plastic sheeting.
 2. While on the roof, intact asbestos-containing material is not required to be kept wet, bagged, or wrapped.
 10. Upon being lowered to the ground, transfer unwrapped material to a closed receptacle in manner that precludes the dispersion of dust. Dispose of the material in an asbestos-accepting Type II landfill. Notify the landfill that the roofing material contains asbestos and provide waste shipment records to Owner within 35 days.
 11. For removal of intact pipeline asphaltic wrap or roof flashings that contain asbestos, engage a competent person to examine the material and determine whether the material is intact and likely to remain intact during removal. Remove the material using manual methods. Sanding, grinding, or other abrading operations are not permitted. Do not throw or drop materials to the ground. Lower the material in a covered, dust-tight chute, crane, or hoist. Remove debris from the roof at the end of the work shift.
- F. Non-Friable Asbestos Containing Exterior Sealant, Caulk, Putty and Window Glazing: Remove exterior non-friable asbestos-containing sealants, caulk, putty and window glazing using the following technique:
1. Any existing loose material shall be HEPA vacuumed prior to removal.
 2. The material shall be thoroughly wetted prior to and during its removal.
 3. The material should be removed as intact as possible. Manual methods such as scraping or raking shall be used, unless power tools are used that are equipped with HEPA ventilation. If power tools are used comply with Article 3.2 (Asbestos Removal by Full Enclosure Method) of this Section.
 4. Asbestos containing materials removed, shall be immediately bagged or wrapped and kept wetted until transferred to a closed receptacle.
 5. The removal of windows and other whole building components without disturbing the asbestos is encouraged. An example of this would be removing a window with asbestos containing glazing or caulk by cutting out the entire window scheduled for demolition. Comply with Article 3.4 (Removal by Entire Structures Method) of this Section when removing entire building components containing asbestos.
 6. If the material becomes friable during the abatement process, comply with the requirements for friable asbestos removal specified in Article 3.2 (Asbestos Removal by Full Enclosure Method) of this Section.

7. Dispose of all asbestos containing materials, including those removed by the entire structures method, per the requirements of this Section.

3.7 SCHEDULE OF ITEMS CONTAINING ASBESTOS

A. Bidding Requirements: Comply with the following requirements related to bidding:

1. Survey quantities provided are approximate. Bidders are required to field investigate as necessary and assume all responsibility to verify the work required and quantities involved for complete asbestos abatement.
2. The building is open for field inspection by all bidders during the bidding period.
3. The below materials have been survey and determined to contain asbestos:

Chemical Building

1. Exterior Lintel Caulk – 66 l.f.
2. Exterior Sill Caulk – 48 l.f.
3. Exterior Window Glaze – Black 372 l.f.

Filter Gallery

1. Exterior Window Caulk / Cream – 150 l.f.
2. Exterior Window Glaze / Black – 213 l.f.
3. Interior Window Caulk / Tan – 745 l.f.
4. Roof Window Glaze / Black – 400 l.f.
5. Roof Window Glaze / Gray – 650 l.f.
6. Roof Window Frame Caulk / Tan – 400 l.f.

Calciner Building

1. Exterior Window Frame Caulk / Gray – 20 l.f.

Industrial Pumping Station

1. Interior Door Caulk / White – 40 l.f.
2. Interior Window Caulk – 120 l.f.
3. Exterior Window Caulk / Grey – 120 l.f.

North Campus Pumping Station

1. Exterior Wall Joint Caulk / Gray – 40 l.f.
2. Exterior Vent Caulk / Gray – 25 l.f.

Asbestos containing materials are yet to be determined for:

- Administration Building
- Ammonia Building
- Barton Pumping Station
- EQ Building
- Generator Building
- Liberty Pumping Station
- Maintenance Building
- Ozone Building
- Re-Carbon Building
- Superior Hydro station

END OF SECTION 02 82 13

SECTION 02 83 19

LEAD BASED PAINT REMEDIATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies requirements for working with lead-containing materials (LCM), during any of the following operations:
 - 1. Demolition of Lead-Containing Materials (LCM): Includes razing a building or any portion of a building or piece of equipment with LCM.
 - 2. Incidental Removal or Disturbance of Lead-Based Paint (LBP): This includes activities such as sanding and scraping for paint preparation activities.
 - 3. Removal of Lead-Based Paint (LBP): Complete removal of LBP from substrate
- B. Extent of known LCM is as follows:
 - 1. Exterior of overhead doors at Calciner Building and Filter Press Building, as specified in related sections, and as indicated on the drawings. Proceed with Work of this Section simultaneously, and in coordination with, remaining Work of the Project.

1.2 DEFINITIONS

- A. The term "Lead-Based Paint" (LBP) is identified as paint or other surface coating such as varnish, sealer or stain containing lead in any detectable amount.
- B. The term "Incidental Removal or Disturbance of Lead-Based Paint" indicates one or more of the following operations:
 - 1. Scraping, hand sanding, or otherwise removing loose LBP from existing surfaces scheduled to remain in place.
- C. The term "Demolition of LCM" refers to cutting, drilling, abrading, demolishing, or otherwise disturbing building elements coated with LBP or containing lead.
- D. The term "Lead-Containing Materials" (LCM) is identified as construction debris coated with lead-based paint or other materials containing lead.
- E. The term "Critical Barrier" indicates the perimeter of the enclosure within which lead disruption/removal work takes place. Critical Barriers may include existing floor, wall, and ceiling structures, as well as constructed partitions, closures and seals.
- F. The term "Project Site" indicates the limits of the Project Site as indicated on drawings or by provisions of this specification.
- G. The term "Work Area" indicates the area within the Critical Barrier.
- H. The term "Action Level" means exposure to an airborne concentration of lead of 30 micrograms per cubic meter of air calculated as an 8-hour time-weighted average (TWA).
- I. The term "Exposure Assessment" means a determination of employee exposures for a given task measured by air monitoring. The Assessment must meet the criteria for objective data as outlined in the MIOSHA/OSHA Lead in Construction Standard (MIOSHA Part 603, R325.51992 and 29 CFR 1926.62).

- J. The term "OSHA PEL" stands for the Permissible Exposure Limit established by the Occupational Safety and Health Administration for lead exposure. The OSHA PEL refers to an airborne concentration of lead of 50 micrograms per cubic meter of air calculated as an 8-hour time-weighted average (TWA).
- K. The abbreviation "TCLP" stands for Toxicity Characteristic Leaching Procedure and refers to one of the tests to determine if waste is considered a Hazardous Waste or non-hazardous solid waste.
- L. The term "Hazardous Waste" refers to a listed waste or any solid or liquid waste with one or more of the following characteristics: toxic, corrosive, flammable, explosive, combustible, oxidizer, pyrophoric, unstable (reactive) or water - reactive.
- M. The term "Non-Hazardous Waste" refers to any solid or liquid waste not exhibiting characteristics of Hazardous Waste.

1.3 SUBMITTALS

- A. Written Compliance Plan: Submit to OWNER OR ENGINEER a Written Compliance Plan incorporating all requirements in the MIOSHA Lead in Construction Standard. Also indicate type of containment and method of liquid waste capture to be established if water is utilized for removal.
- B. Health and Safety Requirements: Submit to OWNER or ENGINEER the following information for each employee that will conduct lead disturbance on the job site:
 - 1. Respiratory Protection Program.
 - 2. Proof of current fit test for respirator that will be worn on Project Site.
 - 3. Proof of medical surveillance for respirator usage and lead work.
 - 4. Proof of lead awareness or higher level of training.

1.4 QUALITY ASSURANCE

- A. Personnel involved in the disturbance of LCM shall be trained in accordance with the requirements of the MIOSHA Lead in Construction Standard, including:
 - 1. The content of the MIOSHA Lead in Construction Standard and its appendices;
 - 2. The specific nature of the operations which could result in exposure to lead above the action level;
 - 3. The purpose, proper selection, fitting, use, and limitations of respirators;
 - 4. The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);
 - 5. The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices;
 - 6. The contents of any compliance plan in effect;
 - 7. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and
 - 8. The employee's right of access to records under 29 CFR 1910.20.

PART 2 - EXECUTION

2.1 HEALTH AND SAFETY REQUIREMENTS

- A. Engage one of the following Environmental Consulting firms to perform environmental / industrial hygiene testing as required:
 - 1. Nova Environmental (734)-930-0995
 - 2. Cardno ATC (248)-669-5140
 - 3. TEK Environmental (810)-355-1580

- B. When performing lead based paint removal:
 - 1. Conduct an initial exposure assessment at the start of the project to determine employee exposure to lead in air as required in MIOSHA Lead in Construction Standard.
 - 2. Collect a minimum of one area air sample per day outside of the work zone in an adjacent interior space to ensure that the action level is not exceeded outside of the work area. A minimum of 1200 liters of air shall be collected for each air sample.
 - 3. Upon completion of removal and clean-up operations, collect a minimum of two air samples within the work area to ensure that airborne lead concentrations are below the action level prior to allowing general occupancy of the space. A minimum of 1200 liters of air should be collected for each air sample.
 - 4. Provide a copy of the Environmental Consulting firm report and analytical testing results to owner.

- C. Job requirements: When the Contractor does not have an Exposure Assessment or the Assessment is determined to be insufficient, the Contractor must conduct personal air monitoring in accordance with the MIOSHA Lead in Construction Standard and follow the requirements below which are outlined by job task until monitoring determines otherwise:
 - 1. Manual demolition, scraping, sanding, heat gun application, power tool cleaning with HEPA dust collection system, spray painting with LCM:
 - a. Use of 1/2 mask respirator with HEPA filters.
 - b. PPE.
 - c. Medical surveillance.
 - d. Use of changing room.
 - e. Use of handwashing facilities.
 - f. Provision of lead awareness training.
 - 2. Using lead mortar, lead burning, rivet busting, power tool cleaning without HEPA collection, cleaning up with dry expendable abrasives, removing or relocating enclosure:
 - a. Loose fitting PAPR with HEPA or supplied air respirator.
 - b. PPE.
 - c. Medical surveillance.
 - d. Use of changing room.
 - e. Use of handwashing facilities.
 - f. Provision of lead awareness training.
 - 3. Abrasive blasting, welding, using cutting torch, burning:
 - a. Supplied air respirator or SCBA.
 - b. PPE
 - c. Medical surveillance.
 - d. Use of changing room.
 - e. Use of handwashing facilities.
 - f. Provision of lead awareness training.

2.2 PREPARATION

- A. General: Prepare Work Areas in a manner that will protect Owner's personnel and property, and the visiting public, from contact with LCM. Prior to beginning work, confirm starting date and time with Owner. Do not begin work that will disturb LCM without Owner's approval.
- B. Preparing Building Exteriors: Ensure adequate measures are in place to limit airborne lead content below the Action Level of 30 ug/m³ (micrograms per cubic meter) adjacent to the Work Area.
 - 1. Erect barricades and install warning tape or signs as necessary to prevent inadvertent exposure of passersby to LCM in all forms, including, but not necessarily limited to dust, particles, and fumes.
 - 2. Completely cover grounds and vegetation with minimum 8-mil thick polyethylene sheets with joints between sheets lapped and taped; with one edge taped to adjacent building surfaces below area of work; and with free ends secured in position with stakes, tie-down lines or weights. Cover sufficient ground area to capture wind-blown chips, dust and particles.
- C. Preparing Building Interiors: Ensure adequate measures are in place to protect building occupants from exposure to airborne lead dust, particles, fumes or other LCM exceeding the Action Level of 30 ug/m³ (micrograms per cubic meter) lead content in air. Adequate measures shall include, but are not necessarily limited to, construction of Critical Barriers and/or establishment of negative pressure within Work Area.
 - 1. Seal off openings and penetrations into the Work Area. Provide temporary dust barriers consisting of at least polyethylene plastic sheet on wood studs. Lap and tape joints of plastic sheeting to prevent dust, particles, fumes, and other forms of lead debris from leaving the enclosed area.
 - 2. Discontinue building ventilation within the Work Area and seal off ventilation supply and return or exhaust diffusers, grilles or openings.
 - 3. Post warning signs at all entrances to the Work Area that state the following, as required in MIOSHA Lead in Construction Standard:
WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

2.3 WORK PRACTICES

- A. General: Perform any removal, demolition or disturbance of LCM in compliance with the following requirements:
 - 1. Restrict access to Work Area to essential personnel.
 - 2. Use moist-removal methods and/or HEPA vacuuming where applicable. Do not over-saturate the Work Area.
 - 3. Any debris generated must be cleaned up immediately before it can be tracked into other areas.
 - 4. Remove contaminated clothing and personal protective equipment before leaving the Work Area, or Work Area enclosure, as applicable.
 - 5. If the Action Level is exceeded outside the Work Area, discontinue work and modify Critical Barrier, or perform other modifications of methods or materials as required to reduce the lead contamination below the Action Level.
 - 6. Prohibit eating, drinking, and smoking in the Work Area.

- B. Incidental Removal of LBP: Remove paint from building surfaces by hand scraping and sanding; or through the use of fluid-applied chemical strippers designed to dry into a solid polymeric sheet and peel off with paint encapsulated. Hand-scraping and sanding must be used in conjunction with moist-removal methods using misted water. Leave moist paint dust and chips in place to air dry before collection.
1. Wet methods (including power-washing) that use amounts of water that can drip, spill, or leak onto the ground, or onto or into other adjacent surfaces are prohibited unless approved by owner.
 2. Dry removal methods (including sand blasting, power sanding, and other methods relying on high velocity mechanical abrasion) that create airborne fine particulate waste materials are prohibited unless specifically reviewed and approved by owner.
 3. Prior to torch-cutting building elements containing LBP, remove paint within four inches of centerline of cut in accordance with requirements of this Section.

2.4 DISPOSAL

- A. Lead Painted Demolition Debris and Lead Paint Chips: In order to determine proper disposal of waste removed from the site, perform Toxicity Characteristic Leaching Procedure (TCLP) testing of LCM waste. If TCLP testing shows the waste to be nonhazardous, the waste can be disposed of as normal construction demolition debris. If waste is classified as Hazardous dispose of material as hazardous waste at an accepting landfill.
1. When storing waste containers on-site, ensure that soil, ground water, and drains or sewers within the storage area are protected from possible contamination. Keep containers secure and tightly closed at all times, except when adding waste.
 2. Keep lead waste segregated from other waste. Do not co-mingle waste. **DO NOT MIX LIQUID AND SOLID WASTE.**
 3. Place appropriate labels on all containers. Provide all information required on the label; mark labels using indelible ink.

2.5 CLEAN UP

- A. Upon completion of LCM or LBP removal and disposal operations, clean all surfaces within the Work Area before it can be tracked into other areas, including, but not necessarily limited to the following:
1. Siding.
 2. Steel support structures.
 3. Floors and ground.
 4. Walls.
 5. Window sills.
 6. Trim.
 7. Ledges and projections.
- B. For projects within building interior spaces, use a HEPA filtered vacuum for removal/elimination of dust, particulates, and debris.
1. Brushing, brooming and other dry methods that generate airborne dust are prohibited.
- C. Remove and dispose of wash water and HEPA filters as Hazardous Waste.
- D. Field Testing: The Owner may visually inspect and/or test the Project Site for evidence of remaining lead contamination. Return to Project Site and, at no additional cost to Owner, re-clean areas found to be contaminated.

END OF SECTION 02 83 19