

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to this Work as if specified in this Section. Work related to this Section is described in:
 - 1. Section 02 80 00 "Facilities Remediation"
 - 2. Section 02 82 00 "Asbestos Abatement"
 - 3. Section 02 83 00 "Heavy Metals-Related Activities"
 - 4. Section 02 84 00 "PCB and Mercury Lamp Removal"
 - 5. Section 02 86 00 "PCB-Containing Bulk Materials Removal"
 - 6. Section 02 87 00 "Water Loss Response"
 - 7. Section 02 88 00 "Biological Contaminants"
 - 8. JOC Abatement Design Scope for this Work Order

1.2 DESCRIPTION

- A. Furnish all labor, materials, facilities, equipment, services, employee training and testing, and agreements necessary to execute the Work Order while employing fugitive dust and silica dust controls in accordance with these Specifications and the latest regulations from the Washington State Department of Labor & Industries' (L&I) Division of Occupational Safety and Health (DOSHS) and any other applicable federal, state or local government agency. Whenever there is a conflict or overlap of the above references, the more stringent provisions are applicable to this Work Order.
- B. In all cases where potential silica dust exposures may occur, the Contractor shall use any and all feasible engineering and work practice controls to reduce and maintain employee exposure levels below the Washington State permissible exposure limit (PEL) of 0.05 milligrams per cubic meter of air (mg/m³) based on an 8-hour time-weighted average (TWA), per Washington Administrative Code (WAC) 296-841. It shall be assumed that the workers generating silica dust are exposed above the PEL until Contractor air monitoring demonstrates levels below the PEL.
- C. The Work specified in the Work Order shall be performed by competent persons that are trained, knowledgeable and qualified in both fugitive and silica dust evaluation and control methods.
- D. If visible fugitive dust emissions are observed or respirable crystalline silica dust concentrations exceed 0.025 mg/m³ beyond the perimeter of the Work Area, the Owner is authorized to stop Work. The Contractor shall perform all necessary corrective actions to eliminate visible dust and reduce respirable crystalline silica concentrations to less than 0.025 mg/m³ before resuming Work. The Owner may visually monitor for fugitive dust and collect air samples for dust and silica at any time.

1.3 SCOPE OF WORK

- A. All construction Work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of all fugitive dusts and monitor dust levels.
- B. Construction site Work that requires control of silica includes, but is not limited to: demolition, chipping, sanding, sawing, jack-hammering or drilling of concrete or gypsum wallboard building materials that may be required by the Work Order.

C. Work activities shall include the following, as applicable:

1. Provision of site security to assure that no member of the public is able to gain access to the construction Work Area at any time. The Contractor shall maintain access and egress routes at all times.
2. In the case of concrete and demolition Work, the Contractor shall provide worker training, respiratory protection and medical examinations, as necessary, to meet applicable silica regulations and regulatory guidance regarding silica exposures.
3. Provision of good work practices to prevent the release of fugitive and silica dust outside of the Work Area, as described in the Execution portion of this Section.
4. Provisions for worker and equipment decontamination. Worker decontamination and equipment areas shall be cleaned daily or as required more frequently to prevent dust emissions.

1.4 PERSONAL PROTECTION

A. Respiratory Protection

1. Where exposures to respirable crystalline silica may exceed the PEL (0.05 mg/m³ based on an 8-hour TWA per WAC 296-841), workers shall be provided, at a minimum, with personally issued and marked respirators. Respirators shall be equipped with National Institute for Occupational Safety and Health (NIOSH)-approved HEPA filters (99.97% efficient), and shall be required to be worn in the designated Work Area. Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used.
2. Where exposures to fugitive dust may exceed the PEL (10 mg/m³ based on an 8-hour TWA per WAC 296-841), workers shall be provided, at a minimum, with personally issued and marked respirators. Respirators shall be equipped with NIOSH-approved HEPA filters (99.97% efficient), and shall be required to be worn in the designated Work Area. Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used.
3. The Contractor shall comply with United States Occupational Safety and Health Administration (OSHA) regulation 29 CFR Part 1926.134 (Respiratory Protection), DOSH regulation WAC 296-842 (Respirators) and American National Standards Institute (ANSI) Standard Z88.2-1990 "Practices for Respiratory Protection".
4. No worker shall be exposed to respirable crystalline silica levels greater than 0.05 mg/m³, as determined by the protection factor of the respirator worn and the airborne respirable crystalline silica levels in the Work Area.
5. No worker shall be exposed to fugitive dust levels greater than 10 mg/m³, as determined by the protection factor of the respirator worn and the airborne fugitive dust levels in the Work Area.
6. A sufficient supply of replacement parts and HEPA filter cartridges shall be provided to the workers.
7. The Contractor shall maintain daily inspection(s) of all respirators to verify cleanliness and to replace damaged, worn or missing parts.

B. Protective Clothing:

1. Workers shall be provided with sufficient sets of protective full-body clothing to be worn in the designated Work Area whenever a potential exposure to respirable crystalline silica concentrations above the PEL exists. Such clothing shall include, but not be limited to coveralls and eye protection.
2. Protective clothing shall not be worn outside the Work Area. Non-disposable protective clothing and footwear shall be left in the Work Area.
3. Eye protection shall be provided and worn as required by applicable safety regulations. Equipment shall conform to ANSI Z87.1-1989.
4. Hard hats or other head protection shall be provided as required by applicable safety regulations. Hard hats shall conform to ANSI Z89.1-1991, Class A or B.
5. Non-skid footwear shall be provided to all workers. Footwear shall conform to ANSI Z41.1-1993, Class 75.
6. Workers shall not eat, drink, smoke, or chew gum or tobacco in or near the Work Area(s)

1.5 SUBMITTALS

- A. The Contractor performing Work that will potentially generate fugitive or silica dust shall provide a complete set of submittals for review by the Owner following procedures listed in Section 01 33 00 Submittals. Following receipt of review comments from the Owner, the Contractor shall submit additional versions of revised submittals to the Owner until each submittal is accepted by the Owner. No Work that will potentially generate fugitive or silica dust will be permitted prior to submittals being reviewed and accepted by the Owner.
- B. Mark each submittal with the following information for proper processing and recording of action taken:
1. Project name and location
 2. Title of submittal
 3. Name and address of Contractor
 4. Date
 5. Submittal Number
- C. Pre-Work Submittals: The Contractor shall submit a detailed Work Plan to the Owner for review as a prerequisite to issuance of the Notice to Proceed. The Plan must be suitably titled and indexed, providing detailed information concerning the following items, at a minimum, in the order listed below:
1. Safety and health hazards.
 2. Personal protective measures and decontamination system requirements.
 3. Respiratory Protection Program per WAC 296-842.
 4. Respirator Fit Test Records: Submit a written statement certifying that all Contractor employees with the potential to be exposed to silica will have respirator fit testing records showing passing results. The statement shall include the Contractor's signature. For the purpose of maintaining worker information privacy, do not submit individual fit testing records with the pre- Work submittal package.

5. Medical Examinations: Submit a written statement certifying that all Contractor employees with the potential to be exposed to silica have received medical examinations as required by DOSH, are medically fit to perform the work, and are medically fit to wear a respirator. The statement shall include the Contractor's signature. For the purpose of maintaining health information privacy, do not submit individual medical clearance certificates with the pre- Work submittal package.
 6. Employee training records.
 7. Specific work practices and procedures.
 8. Description of engineering controls designed to keep fugitive dust and silica exposures below the levels specified herein, outside and inside each Work Area.
 9. Air Monitoring Plan (silica and fugitive dust).
 10. Emergency procedures.
 11. Internal administrative and inspection procedures.
- D. Prior to commencement of Work, the Contractor shall make available for review copies of respirator fit test records showing passing results to the Environmental Consultant or Owner's Representative on site.

1.6 FUGITIVE DUST AND SILICA AIR SAMPLING EVALUATION BY CONTRACTOR

- A. The Contractor shall conduct air sampling for respirable crystalline silica for workers in accordance with WAC 296-841. This sampling will be performed to evaluate worker exposure levels. The Contractor shall submit an Air Monitoring Plan detailing worker air monitoring as part of the Work Plan.
- B. The Contractor shall conduct silica air sampling in accordance with NIOSH Method 7500 to collect a sufficient volume to determine if the airborne silica dust levels are below the PEL. If the minimum detection levels of air samples are above the PEL, the Contractor is required to re-sample at no expense to the Owner.
- C. The Contractor shall conduct air sampling for fugitive dust (total particulate and respirable fraction) for workers in accordance with WAC 296-841. This sampling will be performed to evaluate worker exposure levels. The Contractor shall submit an Air Monitoring Plan detailing worker air monitoring as part of the Work Plan.
- D. The Contractor shall conduct fugitive duct air sampling in accordance with NIOSH Method 0500/0600 to collect a sufficient volume to determine if the airborne fugitive dust levels are below the PEL. If the minimum detection levels of air samples are above the PEL, the Contractor is required to re-sample at no expense to the Owner.
- E. Results of area air samples collected by the Contractor shall be submitted to the Owner within 48 hours after sample collection.

PART 2 - PRODUCTS

2.1 TOOLS AND EQUIPMENT

- A. Provide suitable tools for dust collection and water-spray dust suppression systems.
- B. Provide a sufficient number of HEPA-filtered vacuum cleaners to cleanup visible dust residues.

- C. Air filtration devices shall utilize HEPA filtration systems bearing an Underwriter's Laboratories (UL) 586 label indicating its ability to perform under specified conditions. Provide filters marked with the name of the manufacturer, serial number, airflow rating, efficiency and resistance, and the direction of the test airflow. Units shall have two stages of pre-filtering, as follows:
 - 1. The first stage pre-filter shall be a low efficiency type for particle sizes 100 micrometers and larger.
 - 2. The second stage pre-filter shall be a medium efficiency type effective for particle sizes down to 5 micrometers.
 - 3. Pre-filters shall be installed either on or in the intake grid to the exhaust unit and shall be held in place with dedicated housings or clamps.
- D. Air filtration devices shall also include:
 - 1. An elapsed time meter showing the total accumulated hours of operation
 - 2. An electrical interlock preventing operation of the unit without a HEPA filter
 - 3. An automatic shutdown system to stop the fan in case of a rupture in the HEPA filter or a blocked air discharge
 - 4. Warning lights to indicate normal operation (green), moderately high pressure drop across the filters, such as due to filter overloading (yellow), and too high of a pressure drop due to an overloaded or ruptured HEPA filter or obstructed discharge (red)
 - 5. An audible alarm if the unit shuts down due to operation of the safety systems
 - 6. Electrical components approved by the National Electrical Manufacturers Association (NEMA) and the Underwriter's Laboratories (UL). Each unit shall be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet shall be properly grounded.

PART 3 - EXECUTION

3.1 WET METHOD

- A. Use "wet" systems that eliminate or reduce dust generated by demolition activities. Clean up sludge and /or waste immediately following its generation.

3.2 ENCLOSURE METHOD FOR INTERIOR DEMOLITION ACTIVITIES

- A. For interior demolition, use enclosures in conjunction with air filtration devices, as described in paragraph 2.1D above. Air shall be moved through the filtration unit with a minimum of 1,500 cubic feet per minute (CFM). Provide vacuum units equipped with HEPA filtration to control dust generated at the work face and use tools that include dust control features where possible.

3.3 NEGATIVE AIR PRESSURE SYSTEMS FOR INTERIOR DEMOLITION ACTIVITIES

- A. For demolition activities conducted inside the building, if respirable crystalline silica concentrations exceed 0.025 mg/m^3 outside the work area or if visible levels of dust emissions are observed outside the work area, provide differential air pressure systems for each Work Area in accordance with Appendix J of the United States Environmental Protection Agency's (EPA) "Guidance for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5-85-024.
- B. Negative air pressure shall be continuously monitored by the Contractor using a recording manometer. The location of the pressure measurement tape shall be approved in advance by the Owner. During the operation of the unit(s), recordings shall be collected on a daily basis, dated, and signed by the Contractor's representative present on site. Negative pressure shall be checked at

least four times per day by a person familiar with the operation of the negative pressure filtration units, as well as the recording device. Each check shall be documented with a time and date notation on the circular chart, along with the initials of the person performing the check. A copy of the circular chart record shall be submitted to the Owner on a daily basis. Connect recording instrument to an audible alarm that will activate at a pressure differential of negative 0.020 inches water gauge (-0.020 inches w.g.) air pressure. Defective or non-operating instrumentation may require temporary cessation of Work until instrumentation is replaced.

- C. Exhaust air shall only be vented to the exterior of the building at locations approved by the Owner unless otherwise noted or directed. The Contractor shall provide on-site certification of the negative pressure units to document adequate filtration efficiency for all units exhausting internally within the building or as otherwise required by the Owner.
- D. The Work Area shall have a minimum differential air pressure of -0.020 inches w.g. at all times during concrete demolition activities.

3.4 QUALITY ASSURANCE

- A. An Environmental Consultant or other representative may be contracted by the Owner to observe all matters pertaining to the Work performed in accordance with these Specifications and requirements.
- B. The Environmental Consultant will act as the Owner's liaison, limited to technical matters involving Work that will generate fugitive and silica dust.
- C. The Environmental Consultant is authorized by the Owner to have free access to all fugitive dust and silica Work areas, to assist in interpretation of procedures, and to advise on all provisions of the Work pertaining to the control of dust.
- D. The Owner will advise the Contractor to stop Work if, in the course of performing their monitoring duties, the Environmental Consultant or Owner observes an instance of substantial nonconformance with the Work and/or a situation presenting a health hazard to workers, Owner's employees, or the public. Work shall not resume until corrective measures have been enforced. Instances of substantial non-conformance shall include but not be limited to the following:
 - 1. Visible dust emissions outside of the Work Area barriers
 - 2. Loss of negative pressurization (if required)
 - 3. Activities or misconduct affecting worker's or building occupant's safety
 - 4. Breaches of containment that could substantially damage building life safety systems
- E. If poor work practices are observed, the Owner shall direct the Contractor to make the necessary corrections. If appropriate corrections are not made, or if there is an immediate threat exists that silica dust could be released outside the work area, work shall be stopped. The decision to stop work shall be made by the Owner.
- F. The Environmental Consultant may perform air sampling inside and outside the work area during the Project. The Contractor shall cooperate fully with the Environmental Consultant and ensure the cooperation of his workers during collection of air samples and work area inspections.
- G. The Environmental Consultant's role in advising the Owner on environmental health matters does not relieve the Contractor's obligation to comply with all applicable health and safety regulations promulgated by federal, state and local regulatory agencies. Air monitoring results generated by the Environmental Consultant shall not be used by the Contractor to represent compliance with regulatory agency requirements for monitoring of workers exposure to airborne silica, nor shall any

other activity on the part of the Environmental Consultant represent the Contractor's compliance with applicable health and safety regulations.

3.5 WORK AREA ISOLATION AND CLEANUP

- A. The Contractor shall ensure that fugitive dust and silica contaminants from the work area do not contaminate the interior of the buildings to remain or other areas adjacent to the work area.
- B. The work areas will be considered clean when all visible dust and debris has been removed.

3.6 RECORD KEEPING

- A. The Contractor shall maintain for at least 30 years, a record of the project. Furnish one (1) copy to the Owner. The record shall include the following information:
 - 1. The starting and completion dates of the project
 - 2. A copy of all analytical results
 - 3. Copies of negative pressure documentation records (as required)
 - 4. The name and address of the analytical laboratory used for silica analyses

END OF SECTION