READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

NOTE: This section must be reviewed by the Port Construction Services Regulated Materials Group. Contact: Brian Nichols / (206) 787-7903 / [Nichols.B@portseattle.org](mailto:Nichols.B@portseattle.org)

1. GENERAL
   1. SUMMARY OF WORK
      1. The Contractor shall furnish all labor, materials, facilities, equipment, services, employee training and testing, and agreements necessary to perform the work required for potential silica dust control activities in accordance with these specifications and the latest worker protection regulations from the Washington State Department of Labor and Industries Division of Occupational Safety and Health (DOSH), and for fugitive dust control in accordance with these specifications and the latest regulations from the Puget Sound Clean Air Agency (PSCAA) and any other applicable federal, state, and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
      2. The work specified herein shall be performed by competent persons, trained, knowledgeable and qualified in both fugitive and silica dust evaluation and control methods.
      3. Activities with potential for exposure include, but are not limited to:
         1. Activities where exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the permissible exposure limit (PEL) or action level (AL), and
         2. Activities listed in WAC 296-840, Safety Standards for Respirable Silica, Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica.
      4. If visible fugitive dust emissions are observed or respirable crystalline silica concentrations exceed the applicable PEL and AL beyond the perimeter of the work area, the Port 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 25 g/m3 before resuming work. The Port may visually monitor for fugitive dust and collect air samples for silica at any time.
   2. DEFINITIONS
      1. Definitions relevant to silica:
         1. Action Level (AL): A concentration of airborne respirable silica of 25 micrograms per cubic meter (µg/m3), calculated as an 8-hour time-weighted average (TWA8).
         2. Competent person: An individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in the Contractor’s written Silica Exposure Control Plan.
         3. Engineer: The Port of Seattle Resident Engineer.
         4. Permissible Exposure Limit (PEL): A concentration of airborne respirable silica of 50 g/m3, calculated as an 8-hour time-weighted average (TWA8).
         5. Regulated area: An area, demarcated by the Contractor, where exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL or AL.
         6. WAC Silica Table 1: WAC 296-840, Safety Standards for Respirable Crystalline Silica, Table 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica.
   3. GOVERNING CODES, STANDARDS, AND REFERENCES
      1. Washington State Department of Labor and Industries
         1. WAC 296-840 – Safety Standards for Respirable Crystalline Silica
         2. WAC 296-62-136 – Ventilation
         3. WAC 296-901 – Global Harmonized System for Hazard Communication
      2. Puget Sound Clean Air Agency
         1. Regulation I, Article 9, Section 9.15 – Fugitive Dust Control Measures
      3. U.S. Occupational Safety and Health Administration
         1. 29 CFR 1926.1153 – Respirable Crystalline Silica
         2. 29 CFR 1926.57 – Ventilation
      4. Associated General Contractors of Washington Education Foundation
         1. Guide to Handling Fugitive Dust from Construction Projects, Seattle, Washington, 1997
   4. SCOPE OF WORK
      1. Fugitive Dust: All Construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of fugitive dust by using a combination of reasonable precautions and best work practices.
      2. Silica: Construction work that requires control of silica shall include but not be limited to general demolition, chipping, sanding, tuck-point grinding, scabbling/ scarifying, surface grinding, sawing, jackhammering on concrete building materials, cement mixing, dry sweeping of concrete dust, significant disturbance of and/or removal of non-asbestos fireproofing, and the activities listed in WAC 296-840, Safety Standards for Respirable Crystalline Silica, Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica.
      3. 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 accordance with WAC 296-840, the Contractor is responsible for determining if the activities being performed may reasonably be expected to release respirable silica at or above the PEL and AL. The Contractor shall use, but not be limited to, the following criteria to determine if the work being performed may reach or exceed the PEL or AL:
2. Determine if the activity is listed in WAC 296-840, Safety Standards for Respirable Silica, Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica.
3. Type of work being performed.
4. Duration of work.
5. Work practices and engineering controls being used.
6. Previous air monitoring data from within the last 12 months on projects that were “essentially identical”.
7. Standard or site-specific written operating procedures.
8. Citation history regarding silica.
   * + 1. In the case of work that may generate silica dust at or above the PEL or AL, or that is listed in WAC Silica Table 1, the Contractor shall designate a Competent Person who shall:
9. Provide a written Silica Exposure Control Plan. The Plan shall be made available to the Port if requested.
10. Establish a regulated area.
11. Provide personal protective equipment and engineering controls as required by WAC 296-840.
12. If the activity is not listed in WAC Silica Table 1, conduct exposure evaluations to determine employee exposure to silica and implement feasible exposure controls to reduce employee exposure below the PEL. This may include the revision of work practices and engineering controls, and provision of personal protective equipment.
13. Ensure that exposure controls are being put in place and evaluated for effectiveness.
    * + 1. Provision of best 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, Part 3.
        2. Provisions for worker and equipment decontamination. Worker decontamination and equipment areas shall be cleaned daily or as required more frequently to prevent fugitive dust emissions.
        3. Protection of security, life safety, and energy management systems, including associated wiring, which shall remain operational throughout the work activities.
        4. Decontamination of work area(s). Concrete dust shall be cleaned from the work area using wet methods and HEPA vacuuming equipment at the completion of demolition activities, before barriers are removed.
        5. Water used for dust suppression or decontamination (provided it does not contain additional chemical contaminants) shall be controlled and disposed of as follows:
14. Slurry and residual dust shall be vacuumed during dust-generating operations.
15. Slurry and residual dust shall not remain on permanent concrete or asphalt pavement overnight.
16. Slurry and residual dust shall not drain to Storm Drain System (SDS), Industrial Waste System (IWS), or any other natural or constructed drainage conveyance.
17. Collected slurry residual dust and debris are the responsibility of the Contractor and shall be disposed of off-site in a manner that does not violate groundwater or surface water quality standards.
    1. PERSONAL PROTECTION
       1. Respiratory Protection
          1. Where activities with exposures to respirable crystalline silica are listed in WAC Silica Table 1, and the Table indicates that respiratory protection is required, workers shall be provided, at a minimum, with personally issued respirators equipped with high efficiency particulate air (HEPA) filters approved by NIOSH (99.97% efficient) that meet the assigned protection factor (APR) specified in the Table. Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used.
          2. Where activities with exposures to respirable crystalline silica are not listed in WAC Silica Table 1, and exposures may exceed the PEL or AL, workers shall be provided, at a minimum, with personally issued respirators equipped with HEPA filters approved by NIOSH (99.97% efficient) to be worn in the regulated 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 OSHA 29 CFR Part 1910.134 (Respiratory Protection), WAC 296-841-200 (Evaluate and control employee exposures to Airborne Contaminants), WAC 296-842 (Respirators), and ANSI/AIHA/ASSE Z88 (Respirator Package).
          4. Worker exposure to respirable crystalline silica shall not exceed the PEL or AL. Worker exposure shall be determined by WAC Silica Table 1, the protection factor of the respirator worn, or an exposure assessment.
          5. A sufficient supply of replacement parts and HEPA filter cartridges shall be provided to the workers.
          6. The Contractor shall maintain daily inspection(s) of all respirators to verify cleanliness and to replace damaged, worn or missing parts.
          7. Where respirators are used (in most cases a half-face respirator equipped with HEPA filters), a complete Respirator Program must be put in place in accordance with WAC 296-842. Such a program includes proper selection, fit-testing, cleaning and maintenance, supervision, training, and a written procedure.
       2. Protective Clothing:
          1. Workers shall be provided with sufficient sets of protective full-body clothing to be worn in the regulated work area whenever a potential exposure to respirable crystalline silica concentrations above the PEL or AL 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-type 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 Z87.1-2015.
          4. Head Protection: Hard hats or other head protection shall be provided as required by applicable safety regulations. Hard hats shall conform to ANSI Z89.1-2014, Type I or Type II.
          5. Foot Protection: Nonskid footwear shall be provided to all workers. Footwear shall conform to ANSI F2412/2413-05.
          6. Workers shall not eat, drink, smoke, or chew gum or tobacco in or near the respirable silica work areas.
    2. SUBMITTALS
       1. The Contractor shall provide complete submittals in accordance with Section 01 33 00 - Submittals and as specified below.
       2. Preconstruction Submittals: Prior to conducting any work which is listed in WAC Silica Table 1 or may result in any exposure to silica above the PEL or AL, provide a site-specific Silica Exposure Control Plan which demonstrates the methods by which this work will be performed. At a minimum, the Silica Exposure Control Plan shall include:
          1. A description of the tasks in the workplace that involve exposure to respirable crystalline silica.
          2. A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task.
          3. A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica.
          4. A written description of the annual review of the Silica Exposure Control Plan.
          5. A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors.
          6. If exposure monitoring will be conducted, a description of the exposure monitoring procedures.
             1. The exposure monitoring procedures shall include the proposed sampling plan, sampling procedures, and field quality control procedures of the firm conducting the air monitoring.
       3. Construction Phase Submittals
          1. Air sample data sheets and laboratory analytical results, including chain of custody.
          2. Supervisor daily inspection report, including scope of work completed, engineering controls used, hours worked, and equipment and materials used.
       4. Post-Construction Closeout Submittals
          1. Project Overview: Provide a basic project summary identifying the scope and summarizing the work performed by the Contractor. Provide enough information to have a basic understanding of the project and include project and contact names and ID numbers; Contractor’s company name; where, when, and what type of work was completed; and a discussion of significant problems encountered during the course of the work.
          2. Certification: Provide written certification from the Contractor’s Project Manager or Supervisor that the Contractor has fully inspected the work area and completed work in strict accordance with the Specifications.
          3. Air Monitoring: Submit documentation of all Contractor air monitoring results relative to regulatory compliance. Include copies of all air monitoring data sheets, chain-of-custody documentation and analytical reports for sampling conducted at the site.
          4. Project Record Documents: Provide project records including documentation of all contract changes, and copies of work site entry log books, safety logs, sign-in sheets, and supervisor daily field reports. Provide copies of project meetings for pre-construction, construction period, and project closeout meetings.
          5. Submit copies of inspections or visits by regulatory agencies. Include copies of any citations or notices received by the Contractor from regulatory agencies during the course of the project.
    3. SILICA AIR SAMPLING EVALUATION BY CONTRACTOR
       1. If the Contractor determines that activities being performed are not listed in WAC Silica Table 1 and may reasonably be expected to release respirable silica at or above the PEL or AL, the following shall apply:
          1. The Contractor shall conduct air sampling of workers and subcontractors for respirable crystalline silica. The Contractor shall submit a description of their exposure monitoring procedures as part of its Silica Exposure Control Work Plan.
          2. The Contractor shall conduct personal air sampling for respirable silica in accordance with National Institute for Occupational Safety and Health (NIOSH) Method 7500 or equivalent. Sample volume shall be sufficient to determine if worker exposure to respirable crystalline silica is below the PEL. If analysis of the samples indicates concentrations are above the PEL, the Contractor shall determine the cause of the overexposure and revise work practices and engineering controls to reduce exposures to below the PEL. The Contractor is required to conduct re-sampling and analysis at no expense to the Port of Seattle.
          3. Results of air samples collected by the Contractor shall be submitted to the Engineer within 48 hours following receipt of analytical results.
18. MATERIALS AND EQUIPMENT
    1. EQUIPMENT
       1. Provide suitable tools for dust collection and water-jet dust suppression systems.
       2. Provide sufficient number of HEPA-filtered vacuum cleaners to clean-up visible dust residues.
       3. Air filtration devices shall utilize high efficiency particulate absolute (HEPA) filtration systems bearing a UL 586 label indicating its ability to perform under specified conditions. Provide filters marked with the name of the manufacturer, serial number, airflow ratting, 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 special housings or clamps provided by the manufacturer.
       4. 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.
19. EXECUTION
    1. CONTROL METHODS
       1. Options for the control of fugitive and silica concentrations are given in the following paragraphs. The specific method(s) used shall be detailed in the submittals and approved by the Engineer.
       2. Wet Method
          1. Use best management practices for the control of fugitive dust. This may include but is not limited to the following:
             1. The use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds.
             2. Treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways.
             3. Covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials.
          2. For activities that may generate airborne silica or fugitive dust, use “wet” systems that eliminate or reduce dust generated and tools that include dust control features where possible. Clean up sludge and/or waste immediately following its generation.
       3. Enclosure Method
          1. Use enclosures as listed in Section 01 50 00 - Temporary Facilities and Controls in conjunction with air filtration devices, as described in paragraph 2.01.D. Air shall be moved through the filtration unit at a minimum of 1,500 cubic feet per minute (CFM). Provide HEPA filtered vacuum units to control dust at the point of dust generation, and use tools that include dust control features where possible.
       4. Negative Air Pressure Systems
          1. If visible levels of dust emissions are observed outside the work area, provide differential air pressure systems for each work area.
          2. Construct an enclosure that encompasses the work area.
          3. Exhaust air shall only be vented to locations approved by the Port. 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 Port. Testing may need to be repeated if the unit(s) or their filtration systems have been repaired or replaced during the course of the work, following movement between zones, or if damage has occurred since the units were previously tested. Certification shall be by DOP or Portacount testing and signed by an independent tester or the Contractor's trained Health and Safety personnel. DOP testing shall verify an in-situ efficiency of 99.97% or greater. Portacount testing shall verify an in-situ efficiency of 99.3% or better. The tester(s) shall show knowledge of the testing procedures and limitations to the satisfaction of the Port, including but not limited to knowledge of test modes, variability of results, calibration techniques, and equipment operating procedure. Where knowledge or testing procedures are deemed inadequate, a Professional Engineer or Certified Industrial Hygienist shall sign test results.
    2. OVERSIGHT
       1. An environmental consultant (Consultant) may be retained to advise the Engineer in all matters pertaining to the work performed in accordance with these specifications and requirements. Where an outside consultant is not hired, Port personnel will serve as this Consultant. References to the Consultant herein shall include the outside Consultant or Port personnel.
       2. The Consultant will act as the Engineer’s liaison in technical matters involving the fugitive dust and silica-related work.
       3. The Consultant is authorized by the Engineer to have free access to work areas where silica and fugitive dust may be generated, to assist in interpretation of procedures, and to advise on all provisions of the contract documents pertaining to the control of dust.
       4. The Consultant will advise the Engineer to stop work if in the course of performing their monitoring duties, they observe an instance of substantial nonconformance with the Contract Documents and/or a situation presenting a nuisance to the public or a health hazard to workers, Port 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 (where negative pressure is used).
          3. Activities or misconduct affecting worker or building occupant safety.
          4. Breaches of containment that could substantially damage building life safety systems.
       5. If poor work practices are observed, the Consultant/Port shall direct the Contractor to make the necessary corrections. If appropriate corrections are not made, or if an immediate threat that silica or fugitive dust could be released outside the work area exists, work shall be stopped. The decision to stop work shall be made by the Engineer.
       6. The Consultant may perform air sampling for silica inside and outside the work area during the Project. The Contractor shall cooperate fully with the Consultant and ensure the cooperation of his workers during collection of air samples and work area inspections.
       7. The Consultant's role in advising the port on environmental health matters does not relieve the Contractor's obligation to comply with all applicable health and safety regulations promulgated by the federal, state, or local governments. Air monitoring results generated by the 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 Consultant represent the Contractor's compliance with applicable health and safety regulations.
    3. WORK AREA ISOLATION AND CLEANUP
       1. The Contractor shall continuously endeavor to eliminate the release of fugitive dust and silica into adjacent building spaces.
       2. Work areas where fugitive dust and silica-containing materials will be disturbed shall be isolated from other parts of the building with 6 mil polyethylene critical barriers on all doors, windows, and work area penetrations. Other methods may be approved upon written requests. Coordinate with Section 01 50 00 - Temporary Facilities and Controls for additional information regarding barriers to the public.
       3. The work areas will be considered clean when all visible dust and debris has been removed.
    4. RECORD KEEPING
       1. The Contractor shall maintain, for at least 30 years, a record of the Project. Furnish one copy to the Engineer in an electronic format as part of the post-construction closeout submittals. 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.
          5. The name, address, and social security number (last 4 digits only) of all persons who were engaged in activities that may generate airborne silica or fugitive dust.
20. MEASUREMENT AND PAYMENT
    1. PAYMENT

Choose “Schedule of Unit Prices” or “Lump Sum price bid for the Project” at the end of Paragraph A below.

* + 1. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the Schedule of Unit Prices or Lump Sum bid for the Project.

End of Section

Revision History:

05/01/2014 Conversion to 2004 CSI Numbering System

12/28/18 Updated to comply with new regulation for respirable crystalline silica (WAC 296-840)