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**ATTACHMENTS:**

- A** Policy Review & Certification Log
- B** Specified Exposure Control Assessment
- C** Air Sample Analysis

I certify the Silica Policy for the City of Burlingame (CITY) has been reviewed and revised as necessary.



Interim Deputy Director of Public Works Operations

4/7/2021

Date Effective

## 1.0 PROGRAM REVIEW AND CERTIFICATION

The Silica Policy for the City will be reviewed and revised as necessary to ensure the program is current with applicable regulations and that staff properly implement the engineering controls and work practices that continue to be the most effective, reliable, and protective of worker's health.

CITY will implement new procedures etc., as they are developed and demonstrate great effectiveness, reliability, and worker protection. All revisions are documented on Attachment A – *Program Review and Certification Log*.

## 2.0 PURPOSE

The purpose of this Policy is to:

- 2.1 **Ensure employees use work practices and procedures** that protect themselves and the environment from exposure to silica as outlined in Section 5.0 of this policy.
- 2.2 **Ensure employees do not expose** coworkers, family members or others to hazardous materials from “take home contamination” from their job sites.
- 2.3 **Review Tables 1 and 2** and take appropriate steps to minimize employee exposure to Silica.

## 3.0 SCOPE & APPLICABILITY

CITY has established this Silica Exposure Control Plan for all CITY workers who must handle silica materials for CITY, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 µg/m<sup>3</sup>) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

- 3.1 The following references have been utilized and/or adopted for this safety policy:
  - 3.1.1 Title 8, California Code of Regulations, Section 1532.3 (Construction)
  - 3.1.2 Title 8, California Code of Regulations, Section 5204 (General Industry)

## 4.0 DEFINITIONS

**Action Level** – A concentration of airborne respirable crystalline silica of 25 µg/m<sup>3</sup>, calculated as an 8-hour TWA.

**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 8 CCR 1532.3 subsection (g).

**Employee Exposure** – The exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.

**High-efficiency Particulate Air (HEPA) Filter** – A filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.

**Objective Data** – Information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in CITY’s current operations.

**Physician or Other Licensed Health Care Professional (PLHCP)** – An individual whose legally permitted scope of practice (e.g., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by 8 CCR 1532.3 subsection (h).

**Regulated Area** – An area, demarcated by the employer, where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.

**Respirable Crystalline Silica** – Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality – Particle Size Fraction Definitions for Health-Related Sampling.

**Specialist** – An American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine.

## 5.0 POTENTIAL EXPOSURES

- 5.1 **Exposure is highest** for those conducting construction activities and, generally, occur during abrasive blasting with sand to remove paint and rust from bridges, tanks, concrete structures, and other surfaces. Other construction activities that may result in severe exposure include: jack hammering, rock/well drilling, concrete mixing, concrete drilling, brick and concrete block cutting and sawing, tuck pointing, and tunneling operations. Renovation, demolition and new construction work often entails significant silica exposures to workers. Drywall, plaster, stucco, 2' x 4' ceiling tiles and other similar materials removal/disturbance are also potential exposures.
- 5.2 **General industry employees** have the most severe exposures to crystalline silica from abrasive blasting, which is done to clean and smooth irregularities from molds, jewelry, and foundry castings, finish tombstones, etch or frost glass, or remove paint, oils, rust, or dirt from objects needing to be repainted or treated. Other exposures to silica dust occur in cement and brick manufacturing/disturbance, asphalt pavement manufacturing /disturbance, china and ceramic manufacturing and the tool and die, steel and foundry industries.

- 5.3 **Routine maintenance activities** can expose workers to crystalline silica as well. Ceiling tiles (2' x 4'), drywall, concrete, plaster, stucco, mastics, paints, glazings and putties, among other materials can contain and release crystalline silica when they are disturbed.
- 5.4 **Crystalline silica is used** in manufacturing, household abrasives, adhesives, paints, soaps, and glass. Additionally, crystalline silica exposures occur in the maintenance, repair and replacement of refractory brick furnace linings. In the maritime industry, shipyard employees are exposed to silica primarily in abrasive blasting operations to remove paint and clean and prepare steel hulls, bulkheads, decks, and tanks for paints and coatings.
- 5.5 **Inhaling finely divided crystalline silica is toxic** and can lead to silicosis, bronchitis, lung cancer, and systemic autoimmune diseases, such as lupus and rheumatoid arthritis.
- 5.6 **Symptoms of exposure include:** shortness of breath, fatigue, chest pain, an increase risk of developing tuberculosis, as well as other symptoms associated with dust and particulate matter entering the lungs.
- 5.7 **Typically, symptoms can occur** with either heavy short-term exposure or long-term exposure even at low levels. Disease caused by crystalline silica can also occur from extremely high levels of short-term exposure or from repeated exposures over many years. Silicosis, a scarring of the lung tissue, is a cumulative exposure issue.

## 6.0 EXPOSURE CONTROL METHODS

### 6.1 Typical Materials that Contain Crystalline Silica

6.1.1 All rock and stone; soils (different levels in different types of soil) and building materials that often contain crystalline silica include (but are not limited to): Paint, drywall, concrete, plaster, stucco, ceiling tiles, mastics, window glazing (putty), and any other materials that contains sand, rock or stone as a component of the material.

### 6.2 Testing for Crystalline Silica in Materials

6.2.1 It is not the intent of CITY to conduct sampling for crystalline silica content in any material. All CITY employees disturbing any material that could contain crystalline silica are required to handle the material in a "silica-safe" fashion as described within this policy.

### 6.3 Specified Exposure Control Methods

6.3.1 The control methods and corresponding work practices, engineering controls and personal protective equipment found in Attachment B: Specified Exposure Control Assessment, must be followed, or improved on, by all CITY employees handling materials that may contain crystalline silica – whether the activity is construction based or a general industry activity.

6.3.2 Where a CITY employee performs more than one task on Attachment B: Specified Exposure Control Assessment during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for

each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Attachment B: Specified Exposure Control Assessment combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

#### 6.4 **Alternative Exposure Control Methods**

6.4.1 For tasks not listed in Attachment B – Exposure Control Methods, or where CITY employees do not fully and properly implement the engineering controls, work practices, and respiratory protection described in Attachment B.

6.4.1.1 CITY shall ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of 25 µg/m<sup>3</sup>, calculated as an 8-hour TWA.

6.4.2 For all activities, construction or general industry in nature, City employees will wear half mask respirators with a minimum protection factor of N95 (HEPA filtration) until such time as the process has been shown by air sampling not to create crystalline silica exposures above the action level of 25 µg/cubic meter of air.

### 7.0 **COMPLIANCE WITH SILICA EXPOSURE CONTROL MEASURES**

7.1 **When implementing the control measures** specified in Attachment B, each CITY employee shall:

7.1.1 For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;

7.1.2 For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;

7.2 **For measures implemented** that include an enclosed cab or booth, ensure that the enclosed cab or booth:

7.2.1 Is maintained as free as practicable from settled dust;

7.2.2 Has door seals and closing mechanisms that work properly;

7.2.3 Has gaskets and seals that are in good condition and working properly;

7.2.4 Is under positive pressure maintained through continuous delivery of filtered fresh air;

7.2.5 Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better); and

7.2.6 Has heating and cooling capabilities

## 8.0 EXPOSURE ASSESSMENT

CITY shall assess the exposure of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level using one of the following options:

- 8.1 **Performance Option** – CITY shall assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to respirable crystalline silica.
- 8.2 **Scheduled Monitoring Option** – CITY shall perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification, in each work area.
  - 8.2.1 Where several employees perform the same tasks on the same shift and in the same work area, CITY may sample a representative fraction of these employees in order to meet this requirement. In representative sampling, CITY shall sample the employee(s) who are expected to have the highest exposure to respirable crystalline silica.
  - 8.2.2 If initial monitoring indicates that employee exposures are below the action level, CITY may discontinue monitoring for those employees whose exposures are represented by such monitoring once two consecutive measurements, taken seven days apart, are collected below the action level.
  - 8.2.3 Where the most recent exposure monitoring indicates that employee exposures are at or above the action level but at or below the PEL, CITY shall repeat such monitoring within six months of the most recent monitoring.
  - 8.2.4 Where the most recent exposure monitoring indicates that employee exposures are above the PEL, CITY shall repeat such monitoring within three months of the most recent monitoring.
  - 8.2.5 Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the action level, CITY shall repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the action level, at which time CITY may discontinue monitoring for those employees whose exposures are represented by such monitoring, except as otherwise provided below.
- 8.3 **Reassessment of Exposures** – CITY shall reassess exposures whenever a change in the production, process, engineering control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level, or when CITY has any reason to believe that new or additional exposures at or above the action level have occurred.
- 8.4 **Methods of Sample Analysis** – CITY shall ensure that all samples taken to satisfy the monitoring requirements are evaluated by a laboratory that analyzes air samples for

respirable crystalline silica in accordance with the procedures in Attachment C of this policy.

8.5 **Employee Notification of Assessment Results** – Notification to employees shall be done as follows:

8.5.1 Within five working days after completing an exposure assessment CITY shall individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees.

8.5.2 Whenever an exposure assessment indicates that employee exposure is above the PEL, CITY shall describe in the written notification the corrective action being taken to reduce employee exposure to, or below, the PEL.

8.6 **Observation of Monitoring** – Where air monitoring is performed to comply with the requirements of this section:

8.6.1 CITY shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to respirable crystalline silica.

8.6.2 When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, CITY shall provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

## 9.0 HOUSEKEEPING

9.1 The City has tested for respirable crystalline silica during the limited, short duration dry sweeping activities Public Works employees typically perform and the results indicated exposure is below the PEL.

9.1.1 In accordance with CCR Title 8 Section 1532.3(f)(1), the City shall not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to respirable crystalline silica unless: wet sweeping, HEPA-filtered vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

9.2 **City shall not allow compressed air** to be used to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air (leaf blowers used to move soil, dust or dirt could cause significant exposures).

## 10.0 REGULATED AREAS

10.1 **Establishment** – The employer shall establish a regulated area wherever an employee's exposure to airborne concentrations of respirable crystalline silica is, or can reasonably be expected to be, in excess of the Permissible Exposure Limit (PEL).

10.2 **Demarcation** – City employees shall:

10.2.1 Demarcate regulated areas from the rest of the workplace in a manner that minimizes the number of employees exposed to respirable crystalline silica within the regulated area.

10.2.2 Post signs at all entrances to regulated areas that bear the legend specified in subsection 8 CCR 5204 (j)(2):

DANGER  
RESPIRABLE CRYSTALLINE SILICA  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
WEAR REPIRATORY PROTECTION IN THIS AREA  
AUTHORIZED PERSONNEL ONLY

10.2.3 Limit access to regulated areas to:

10.2.3.1 Persons authorized by the City and required by work duties to be present in the regulated area;

10.2.3.2 Any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring procedures; and

10.2.3.3 Any person authorized by the Occupational Safety and Health Act or regulations issued under it to be a regulated area.

10.3 **Provision of Respirators** – The City shall provide each employee and the employee’s designated representative entering a regulated area with an appropriate respirator equipped with HEPA cartridges (or a single use filtering face piece respirator rated at N-95) and shall require each employee and the employee’s designated representative to use the respirator while in a regulated area.

## 11.0 WRITTEN EXPOSURE CONTROL PLAN AND ANNUAL REVIEW

11.1 The City shall establish and implement a written exposure control plan that contains at least the following elements:

11.1.1 A description of the tasks in the workplace that involve exposure to respirable crystalline silica;

11.1.2 A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task; and

11.1.3 A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica.



- 11.2 The City shall review and evaluate the effectiveness of the written exposure control plan at least annually and update it as necessary. The review shall include:
- 11.2.1 Communication of respirable crystalline silica hazards to employees that comply to The City's Hazard Communication Policy and the Hazard Communication Standard (HCS) found in CCR 8, Section 5194.
  - 11.2.2 The City shall ensure that each employee has access to labels on containers of crystalline silica and safety data sheets and is trained in accordance with the provisions of HCS. The City shall ensure that at least the following hazards are addressed: cancer, lung effects, immune system effects, and kidney effects.
  - 11.2.3 All on-site observations of work practices and air sampling results will be maintained by City as part of this Written Plan Annual Review.
  - 11.2.4 The effectiveness of the control plan shall be reviewed and changed as necessary to protect the health of City employees.
  - 11.2.5 All changes to this policy shall be documented in Attachment A.
  - 11.2.6 This annual review shall be submitted to Cal/OSHA upon request from the Division of Occupational Safety & Health Administration.

## 12.0 TRAINING – City shall:

- 12.1 Ensure that each employee covered by this section can demonstrate knowledge and understanding of at least the following:
- 12.1.1 The health hazards associated with exposure to respirable crystalline silica;
  - 12.1.2 Specific tasks in the workplace that could result in exposure to respirable crystalline silica;
  - 12.1.3 Specific measures the City has implemented to protect employees from exposure to respirable crystalline silica, including engineering control, work practices, and respirators to be used;
  - 12.1.4 The contents of 12.0 Training section;
  - 12.1.5 The identity of the competent person designated by the City; and
  - 12.1.6 The purpose and a description of the medical surveillance program (see Section 13.3).
- 12.2 Make a copy of this section readily available without cost to each employee covered by this section.

## 13.0 RECORD KEEPING

- 13.1 **Air Sample Analysis/Monitoring Data** – The City shall make and maintain an accurate record of all exposure measurements taken to assess employee exposure to respirable crystalline silica. This record shall include:

- 13.1.1 The date of measurement for each sample taken;
  - 13.1.2 The task monitored;
  - 13.1.3 Sampling and analytical methods used;
  - 13.1.4 Number, duration, and results of samples taken;
  - 13.1.5 Identity of the laboratory that performed the analysis;
  - 13.1.6 Type of personal protection equipment, such as respirators, worn by employees monitored; and
  - 13.1.7 Name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.
  - 13.1.8 The City shall ensure that exposure records are maintained and made available in accordance with Sections 13.5 & 13.6.
- 13.2 **Objective Data** – The City shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of this section. This record shall include:
- 13.2.1 The crystalline silica-containing material in question;
  - 13.2.2 The source of the objective data;
  - 13.2.3 The testing protocol and results of testing;
  - 13.2.4 A description of the process, task, activity, material, or exposures on which the objective data were based.
  - 13.2.5 Other data relevant to the process, task, activities, material, or exposures on which the objective data were based.
  - 13.2.6 The City shall ensure that objective data are maintained and made available in accordance with Section 13.6.
- 13.3 **Medical Surveillance Records** – Employee medical surveillance records shall be kept confidential and shall be maintained by the City of Burlingame, Human Resources Division. Medical surveillance records shall be maintained for the duration of employment plus thirty (30) years, in accordance with Section 3204 of the General Industry Safety Orders.
- 13.4 **Training Records** – The employer shall maintain all employee training records for one (1) year beyond the last date of employment by that employer.
- 13.5 **Other Records** – The following documents shall be maintained by the Regulatory Compliance Officer:
- 13.5.1 Initial exposure assessment data
  - 13.5.2 Negative exposure determination records
  - 13.5.3 Respirator program compliance records (e.g., medical evaluations and fit tests)
  - 13.5.4 All other related records as required by Cal/OSHA Section 1532.3 and standards

- 13.6 **Access to Records** – Employees shall have access to any and all records that apply directly to their exposure to crystalline silica and their use of a respirator.
- 13.7 **Transfer of Records** – Records will be transferred as set forth in Section 3204 of the General Industry Safety orders.

## 14.0 RESPONSIBILITIES

- 14.1 **Deputy Director of Public Works Operations** – Has the overall authority and responsibility for implementing the provisions of the Silica Exposure Control Plan for the City Specific responsibilities including, but not limited to:
- 14.1.1 Responsibility and authority for ensuring this policy is fully implemented
  - 14.1.2 Ensuring that funding is provided to successfully implement the policy requirements
  - 14.1.3 Ensuring that the policy and policy requirements are enforced.
  - 14.1.4 Implementing all other relevant responsibilities as identified in the injury illness prevention program (IIPP)
- 14.2 **Division Managers** – The Division Managers are responsible for the following administrative elements of the Silica Exposure Control Plan
- 14.2.1 Monitoring the effectiveness of the Silica Exposure Control Plan by performing a policy review in accordance with Section 11.2 and completing the *Program Review and Certification Log (Attachment A)*.
  - 14.2.2 Coordinating, scheduling and/or providing initial and annual refresher training in accordance with Section 12.
  - 14.2.3 Maintaining training records in accordance with Section 13.
  - 14.2.4 Providing personnel guidance on the laws and regulations governing the Silica Exposure Control Plan and conducting the necessary research to determine those requirements and the standards that apply.
  - 14.2.5 Assisting supervisors in investigating tasks with possible silica exposures and exposure incidents.
- 14.3 **Supervisors** are responsible for:
- 14.3.1 Ensuring that new employees complete initial training in accordance with Section 12.0 as they relate to their specific job duties.
  - 14.3.2 Monitoring employees under their direct supervision for compliance with the provisions of this Silica Exposure Control Plan's safe work practices.
  - 14.3.3 Ensuring that personal protective equipment, necessary to comply with the Exposure Control Plan Safe Work Practices, is available and accessible to employees.

- 14.3.4 Reporting any silica exposure incidents to their direct supervisor as soon as they become aware of, or are notified of, an exposure incident.
- 14.3.5 Investigating exposure incidents.
- 14.4 **Employees** are responsible for the following:
  - 14.4.1 Successfully completing all required training.
  - 14.4.2 Immediately reporting all tasks with possible silica exposures in excess of the action level or PEL.
  - 14.4.3 Following all applicable safe work practices identified in the Silica Exposure Control Plan.
  - 14.4.4 Informing their Supervisor if additional personal protective equipment is needed, or if a different type or size is needed to adequately protect themselves.



**ATTACHMENT B**

**SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA**

KEY: SECTION EXPOSURE: **S**=SEWERS; **ST**=STREETS; **FM**=FACILITIES MAINT; **F**=FLEET; WATER: **W**; **N/A** = NOT APPLICABLE

EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
a. Stationary Masonry Saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.	None	None	W; ST
b. Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions:			ST; S; W
	▶ When used outdoors	None	APF10	
	▶ When used indoors or in an enclosed area	APF10	APF10	
c. Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)	<b>For tasks performed outdoors only:</b> Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.  Dust Collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None	FM

City of Burlingame  
Silica Exposure Control Plan

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
d. Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions:			S; St; W
	▶ When used outdoors	None	APF10	
	▶ When used indoors or in an enclosed area.	APF10	APF10	
e. Drivable saws	<b>For tasks performed outdoors only:</b> Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.  Dust Collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None	NA
f. Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface.  Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions:	None	None	NA
g. Handheld and stand-mounted drills (including	<b>For tasks performed outdoors only:</b> Use saw equipped with commercially available dust collection system. Operate and maintain	None	None	W, ST; FM

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
impact and rotary hammer drills) – (e.g., Mag drill)	<p>tool in accordance with manufacturer’s instruction to minimize dust emissions.</p> <p>Dust Collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</p> <p>Use a HEPA-filtered vacuum when cleaning holes.</p>			
h. Vehicle-mounted drilling rigs for rock and concrete	<p>Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector</p> <p><b>Or</b></p> <p>Operate from within an enclosed cab and use water for dust suppression on drill bit</p>	None	None	NA
i. Jackhammers and handheld powered chipping tools	<p>▶ When used outdoors</p> <p><b>See Attachment D for air monitoring results.</b></p>	None	None	ST; S; W
	<p>▶ When used indoors or in an enclosed area</p> <p>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:</p> <p><b>Or</b></p>	APF 10	APF 10	



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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
	<p>Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.</p> <p>Dust Collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</p>			
j. Handheld grinders for mortar removal (e.g., tuckpointing)	<p>Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.</p> <p>Dust Collector must provide 25 cubic feet per minute (CFM) or greater of air flow per inch of wheel diameter, and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.</p>	APF 10	APF25	NA
k. Handheld grinders for uses other than mortar removal	<p><b>For tasks performed outdoors only:</b> Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.</p> <p>Operate and maintain tool in accordance with manufacturer's instruction to minimize dust emissions.</p> <p><b>Or</b></p> <p>Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with</p>			S; W; St; FM: F

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
	<p>manufacturer's instruction to minimize dust emissions.</p> <p>Dust Collector must provide 25 cubic feet per minute (CFM) or greater of air flow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.</p>			
	<p>▶ when used outdoors</p>	None	None	
	<p>▶ when used indoors or in an enclosed area</p>	None	APF 10	
I. Walk-behind milling machines and floor grinders	<p>Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p><b>Or</b></p> <p>Use machine equipped with dust collection system recommended by the Manufacturer.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</p>	None	None	ST

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**SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA**

KEY: SECTION EXPOSURE: **S**=SEWERS; **ST**=STREETS; **FM**=FACILITIES MAINT; **F**=FLEET; **W**=WATER; **N/A** = NOT APPLICABLE

EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
	When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.			
m. Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant.  Operate and maintain machine to minimize dust emissions	None	None	
n. large drivable milling machines (half-lane and larger)	<b>For cuts of any depth on asphalt only:</b> Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.  Operate and maintain machine to minimize dust emissions  <b>For cuts of four inches in depth or less on any substrate:</b> Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.  Operate and maintain machine to minimize dust emissions  <b>Or</b>  Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None	NA
o. Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and	None	None	NA

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
	discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.			
p. Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping, backhoe with Stinger Adaptor, or used during demolition activities involving silica-containing materials.	Operate equipment from within an enclosed cab. When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None	ST; S; W
q. Heavy equipment and utility vehicles for tasks such as grading and excavating, but not including: Demolishing, abrading, or fracturing silica-containing materials.	Apply water and/or dust suppressants as necessary to minimize dust emissions. <b>Or</b> When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None	ST; S; W
r. Portable Concrete Mixer	Use of water to wet packaged materials and air space as opened by	None	None	ST; S; W

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
	<p>workers.</p> <p>Use of water at loading point of the materials into mixer to prevent emissions of material / dust.</p> <p>No unnecessary personnel shall loiter near mixer during operation to prevent exposures.</p> <p><b>See Attachment D for air monitoring results.</b></p>			
s. Concrete removal/chipping using manual hammer.	<b>See Attachment D for air monitoring results.</b>	None	None	ST; S; W; F; FM
t. Shoveling sand into sandbags	<b>See Attachment D for air monitoring results.</b>	None	None	W; S; ST
u. Manual sweeping of roads of construction debris	<b>See Attachment D for air monitoring results.</b>	None	None	W; S; ST
v. Mixing concrete/mortar (<4 bags)	<b>See Attachment D for air monitoring results.</b>	None	None	W; S; ST
w. Powered blower use on hardscape	<b>See Attachment D for air monitoring results.</b>	None	None	W; ST; S
x. Loading concrete debris into debris bin	<b>See Attachment D for air monitoring results.</b>	None	None	W; ST; S

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EQUIPMENT/TASK	ENGINEERING & WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION & MINIMUM ASSIGNED PROTECTION FACTOR (APF)		EXPOSURE BY SECTION
		≤4 Hours/shift	>4 Hours/shift	
y. Walk Behind Compactor	<b>See Attachment D for air monitoring results.</b>	None	None	W; ST; S
z. Street Sweepers	Operator is inside an enclosed cab (integrated water system) <b>See Attachment D for air monitoring results.</b>	None	None	ST
aa. Cutting ceiling tile and sheet rock	<b>See Attachment D for air monitoring results.</b>	None	None	FM
bb. Whacker Saw	<b>See Attachment D for air monitoring results.</b>	None	None	FM

## ATTACHMENT C

### AIR SAMPLE ANALYSIS

Methods of Sample Analysis (Appendix A of Title 8, Section 1532.3)

DANGER  
RESPIRABLE CRYSTALLINE SILICA  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
WEAR REPIRATORY PROTECTION IN THIS AREA  
AUTHORIZED PERSONNEL ONLY

This attachment specifies the procedures for analyzing air samples for respirable crystalline silica, as well as the quality control procedures that employers must ensure that laboratories use when performing an analysis required under Section 1532.3 (d)(2)(E). City must ensure that such a laboratory:

1. Evaluates all samples using the procedures specified in one of the following analytical methods: OSHA ID-142; NMAM 7500; NMAM 7602; NMAM 7603; MSHA P-2; or MSHA P-7;
2. Is accredited to ANS/ISO/IEC Standard 17025:2005 with respect to crystalline silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs;
3. Uses the most current National Institute of Standards and Technology (NIST) or NIST traceable standards for instrument calibration or instrument calibration verification;
4. Implements an internal Quality Control (QC) program that evaluates analytical uncertainty and provides employers with estimates of sampling and analytical error;
5. Characterizes the sample material by identifying polymorphs of respirable crystalline silica present, identifies the presence of any interfering compounds that might affect the analysis, and makes any corrections necessary in order to obtain accurate sample analysis; and
6. Analyzes quantitatively for crystalline silica only after confirming that the sample matrix is free of uncorrectable analytical interferences, corrects for analytical interferences, and uses a method that meets the following performance specifications:
  - a. Each day that samples are analyzed, performs instrument calibration checks with standards that bracket the sample concentrations;
  - b. Uses five or more calibration standard levels to prepare calibration curves and ensures that standards are distributed through the calibration range in a manner that accurately reflects the underlying calibration curve; and
  - c. Optimizes methods and instruments to obtain a quantitative limit of detection that represents a value no higher than 25 percent of the PEL based on sample air volume.

7. Evaluates all samples using the procedures specified in one of the following analytical methods: OSHA ID-142; NMAM 7500; NMAM 7602; NMAM 7603; MSHA P-2; or MSHA P-7;
8. Is accredited to ANS/ISO/IEC Standard 17025:2005 with respect to crystalline silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs;
9. Uses the most current National Institute of Standards and Technology (NIST) or NIST traceable standards for instrument calibration or instrument calibration verification;
10. Implements an internal Quality Control (QC) program that evaluates analytical uncertainty and provides employers with estimates of sampling and analytical error;
11. Characterizes the sample material by identifying polymorphs of respirable crystalline silica present, identifies the presence of any interfering compounds that might affect the analysis, and makes any corrections necessary in order to obtain accurate sample analysis; and
12. Analyzes quantitatively for crystalline silica only after confirming that the sample matrix is free of uncorrectable analytical interferences, corrects for analytical interferences, and uses a method that meets the following performance specifications:
  - a. Each day that samples are analyzed, performs instrument calibration checks with standards that bracket the sample concentrations;
  - b. Uses five or more calibration standard levels to prepare calibration curves and ensures that standards are distributed through the calibration range in a manner that accurately reflects the underlying calibration curve; and
  - c. Optimizes methods and instruments to obtain a quantitative limit of detection that represents a value no higher than 25 percent of the PEL based on sample air volume.



**ATTACHMENT D**  
**AIR MONITORING RESULTS**

*(Atmospheric Sampling Results Located on PW Shared Drive)*

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LIBRARY\_ARCHIVED\AIR SAMPLE ANALYSIS\_RPP & SLICA ECP**

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