####

Silica Exposure Control Plan

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#### Crystalline Silica

Crystalline silica is a basic component of soil, sand, granite, and many other minerals. The silica found in quartz, tridymite, cristobalite, and tripoli is a crystalline form that can cause significant and irreversible health problems for exposed workers.

When a worker inhales crystalline silica dust it can be deposited into the tiny air sacs of the lungs. Crystalline silica dust with a diameter of less than 10 micrometers tend to settle in the lungs and are considered “respirable” particles. Once in the lungs, respirable crystalline silica tends to form scar tissue, creating a condition known as silicosis. There is no cure for silicosis, so the key is to prevent silicosis by employing safety precautions so employees will not be exposed. The different stages of silicosis are:

* **Acute silicosis** occurs after a few months or as long as two years following exposures to extremely high concentrations of respirable crystalline silica. Symptoms of acute silicosis include severe disabling shortness of breath, weakness and weight loss, which often leads to death.
* **Accelerated silicosis** can occur after 5-10 years of high exposures to respirable crystalline silica. Symptoms include severe shortness of breath, weakness and weight loss. The onset of symptoms takes longer than in acute silicosis.
* **Chronic/classic silicosis**, the most common, occurs after 15-20 years of moderate to low exposures to respirable crystalline silica. Symptoms associated with chronic silicosis may or may not be obvious; therefore, workers need to have a chest x-ray to determine if there is lung damage. As the disease progresses, the worker may experience shortness of breath upon exercising and have clinical signs of poor oxygen/carbon dioxide exchange. In the later stages, the worker may experience fatigue, extreme shortness of breath, chest pain or respiratory failure.

Crystalline silica can also cause:

* Lung Cancer (silica has been classified as a human lung carcinogen)
* Bronchitis/Chronic Obstructive Pulmonary Disorder
* Tuberculosis
* Scleroderma
* Possible renal disease

The current OSHA permissible exposure limit (PEL for respirable dust containing crystalline silica (quartz) is measured by millions of particles per cubic foot (mppcf) and is calculated as:

* PEL = 50ug/cubic meter TWA
* Action Level = 25ug/ cubic meter TWA

This exposure limit is found in 29 CFR 1926.55.

Exposure to crystalline silica occurs during many different construction activities. The most severe exposures generally occur during abrasive blasting with sand to remove paint and rust from bridges, tanks, concrete structures and other surfaces. Other 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.

Balestrieri follows OSHA requirements to prevent their employees from exposure to crystalline silica. These procedures include but are not limited to:

* Provide engineering or administrative controls, such as local exhaust ventilation.
* Replace crystalline silica materials with safer substitutes, whenever possible.
* The use of protective equipment and measures to reduce exposures below the PEL.
* The use of all available work practices to control dust exposures, such as water sprays and wet methods for cutting, chipping, drilling, sawing, grinding, etc.
* The use of HEPA vacuums for waste.
* The use of respirators approved for protection against silica.
* Provide training about safe handling, labeling and storage of toxic materials (30 CFR 56.20012, 56.16004, 57.20012, 77.208).
* Provide training, exposure monitoring and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposure.
* Provide employee awareness of the health hazards related to exposure to crystalline silica. Smoking adds to the lung damage caused by silica exposure.
* Warnings to employees to not eat, drink or smoke near crystalline silica dust.
* Post warnings outside the abrasive blasting area that read:
	+ **WARNING – CRYSTALLINE SILICA WORK AREA – Exposure may cause silicosis (a serious lung disease), cancer and death. RESPIRATOR REQUIRED**
* Training for employees to wash hands and face before eating, drinking or smoking away from the exposed area.
* Training for employees to park vehicles away from exposed area so crystalline silica will not land on the vehicles.
* Training for employees to clean off and remove all protective equipment before leaving the exposed area.

Balestrieri follows federal regulations for employee exposure limits and employees are monitored for crystalline silica exposure.

**Silica Written Exposure Plan:**

Below is a brief description of both the task and any applicable, accompanying engineering controls, work practices, protective equipment or housekeeping measures to use to limit employee exposure to silica dust.

**TASK: Wall Sawing**

***Description:*** Saw cutting concrete walls and floors inside buildings.

***Controls:*** when wall sawing water will be used to control the dust. Position the guard as close to the wall as possible to reduce exposure. Position the employee as far away from mist as possible.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas,*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Core Drilling**

***Description:*** Core drilling concrete floors inside.

***Controls:*** When core drilling water will be used to control the dust.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Wire Sawing**

***Description:*** Using a wire saw to cut concrete.

***Controls:*** When wire sawing water will be used to control dust. Position the employee as far away from mist as possible.

***Respiratory Protection***: Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Handheld Chain Saw/ Hand Saw**

***Description:*** Chain/Hand sawing concrete

***Controls:*** When chain/hand sawing concrete water will be used to control dust. Position the employee as far away from the mist as possible.

***Respiratory Protection:*** Use p100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using the respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Jack Hammering**

***Description:*** Jack Hammering concrete.

***Controls:*** When jack hammering concrete water will be used to control dust.

***Respiratory Protection***: Use p100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using the respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Dry Abrasive Blasting**

***Description:*** Blasting media – silica used for cleaning/restoring impacted structures indoors and outdoors.

***Impacted Structures:*** CMU, brick, structural steel or other metals, wood and plaster walls .

***Controls:*** Use of HEPA equipped air ventilators with air changes. HEPA equipped vacuums, critical barriers or hard barriers to be used. Clean accumulated blast media at least once every 2 hours and containerize. Use a non-silica blast media when possible to reduce silica exposure.

***Respiratory Protection:*** Supplied air loose fitting hood/helmet with shield. Use p100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using the respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***PPE:*** Disposal suits, leather gloves/Impermeable gloves, proper boots, ear plugs and muffs if both are feasible.

***Restrict Access to work areas:*** Establish regulated areas and use of proper signage of potential hazards. Schedule the work so that only the employees who are engaged in the task are in the area

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

**TASK: Sand Induction Blasting/Vapor Blasting**

***Description:*** Blasting media – Silica used indoors and outdoors.

***Controls:*** HEPA equipped air ventilators with air exchanges. Negative pressure enclosures if other hazardous materials are impacted from the operation. Establish regulated areas and use of appropriate signage to be placed.

***Respiratory Protection:*** Supplied air loose fitting hood/helmet.

***PPE:*** Disposable suits, ear plugs and muffs if both feasible, impermeable gloves/leather gloves.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work areas:*** Schedule the work so that only the employees who are engaged in the task are in the area.

**Competent Person:**

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**Restricting Bystander Access:**

The following list of restricted areas is based on Table 1 of the final rule. Construction employers will need to customize this list to satisfy their legal obligations and accommodate their workplace safety requirements.

**TASK: Handheld grinders for mortar removal/Handheld grinders**

***Description:*** Handheld grinders to remove mortar

***Controls:*** When using hand held grinders for motar removal position the employee as far as possible from dust source as possible, use water at cutting points.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Walk-behind floor grinders**

***Description:*** Walk behind floor grinders for concrete.

***Controls:*** When using walk behind grinders position the employee as far as possible from dust source as possible, use water to reduce dust.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas***: Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (Skidsteers or Track Backhoe (outdoor work):**

***Description:*** Heavy Equipment used during demolition for outdoor work

***Control:*** When temperatures are above freezing, water will be used or misting to decrease dust.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage.

**TASK: Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (Skidsteers or Track Backhoe (indoor work):**

***Description:*** Heavy Equipment used during demolition for outdoor work

***Control:*** When temperatures are above freezing, water will be used or misting to decrease dust.

***Respiratory Protection:*** Use P100 filtering face piece respirator when the exposure is over 4 hours. Employer shall make medical surveillance available at no cost to the employee for employees using respirator for more than 30 days per year. The medical exams will be made available at least every 3 years.

***Housekeeping:*** Dust containing silica on work surfaces and equipment must be cleaned using wet methods or a HEPA-filtered vacuum.

***Restrict Access to work Areas:*** Schedule the work so that only the employees who are engaged in the task are in the area. Use of proper demarcation with signage. Set up critical barriers, use of negative air exchanges.