



**Coring &
Cutting Group**

HEALTH AND SAFETY PLAN

Effective January 1, 2017

CCG Practices

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SAFETY AND HEALTH POLICIES

A. POLICY STATEMENT

To all Employees:

One of **CCG** primary responsibilities is to administer a Site Safety and Health Plan. **CCG** shall provide and maintain a safe and healthful workplace for workers and the public. All workers shall be constantly aware of their responsibility to work in a safe and healthful manner.

This Site Safety and Health Plan embodies the prevention of accidental injury, occupational illness and property damage and ensures the involvement and active participation of all workers of **CCG**. The Safety and health standards herein set forth only minimum standards in certain key areas, are not exclusive or exhaustive every Safety and health requirements.

The Site Supervisor will coordinate the Safety and health activities of this project through contact with project management to insure that the Site Safety and Health Plan is functioning as expected.

Building a successful Safety program requires a concerted personal and team effort. **CCG** is committed to protecting its employees by developing and endorsing a leading industry Safety program. It is the responsibility of all employees to not only support the Safety and health program, but to actively contribute toward its continued progress and improvement.



Please think Safety and always work safely.

B. POSTING OF THE SAFETY AND HEALTH PLAN

CCG understands that this Site Safety and Health Plan becomes a vital document for ensuring that all activities are carried out safely on the project. It is important that every worker involved in the project be aware of its existence, and has the opportunity to examine it to learn how to safeguard his or her Safety and health.

- A notice will be posted at the main office's bulletin board used to post legal and labor-related materials that the Site Safety and Health Plan is available for examination by any person.
- Subsequent revisions and/or additions will be incorporated into the plan and maintained as necessary.

C. ORGANIZATON

1. Safety Coordinator: A CCG employee, appointed by CCG President/Director, responsible for implementing and controlling the Safety and Health Plan. _____ has been appointed as the Safety coordinator.
2. Supervisors: A CCG employee directly responsible for work and control of persons in their area of responsibility. The following employees are assigned a supervisory position:

3. Competent Persons: CCG employee who can identify hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangers to employees, and who has authorization to take prompt corrective measure to eliminate them. (see Safety and Health Competent Person Assignments sheet in the Appendix A - Site Forms for individual responsibilities).
4. Project Workers: All CCG employees involved in the construction of a project.

D. RESPONSIBILITY

Responsibilities for Safety and health include the establishment and maintenance of an effective communication system between management officials, supervisors, and workers. The following is a summary of the health and Safety responsibilities of key personnel for this project.

1. Safety Coordinator

- Be held accountable and is responsible for implementing and insuring compliance with **CCG** Site Safety and health plan, the Contract Documents, OSHA standards and all other federal, state, and local codes, laws and regulations.
- Ensure that all accidents are investigated with reporting and documentation are required by **CCG** and by law.
- Receive and distribute all Safety-related correspondence and copies of all accident reports.
- Schedule, distribute notification of, and chair all of this site's Project Safety Meetings.
- Conduct a project Safety and health inspection and submit to the site superintendent a minimum of one complete written report per week. This report, noting deficiencies and corrective actions to be taken, including dates showing when corrective actions will be completed and who is responsible for the correction(s), should be included on the Project Safety Meetings agenda.
- Implement and insure corrective action regarding noncompliance with **CCG** Site Safety and health plan, the Contract Documents, OSHA standards and all other federal, state and local codes, laws and regulations.
- Check with Supervisors, General Contractor Safety Representatives, and/or other Subcontractor Safety Representatives on Safety and health related matters.
- Provide assistance at **CCG** Safety Meetings, Toolbox Talks when requested.
- Investigate all accidents and complete related reports and documentation. Review accident reports and investigations submitted by supervisors.
- Distribute all Safety Meeting minutes, Safety Bulletins and other Safety related items.
- Conduct or arrange for **CCG** New Hire Orientation.

2. Supervisors

- Demonstrate and explain to workers the proper Safety and health precautions and actions that must be taken before beginning any tasks. Always set a good example, demonstrate a pro-active attitude toward Safety and communicate their sincere commitment to the Safety and health of their crew members.

- Make provision for immediate first aid and/or medical/hospital treatment for all work related injuries and illnesses of **CCG** employees.
- Regularly inspect this construction project for Safety and health compliance and demonstrate a proactive Safety and health attitude by communicating his/her observations to supervisors throughout the project.
- Have on hand prior to the start of work all tools, materials, equipment and personal protective equipment needed to perform the jobs safely and insure that it has been inspected prior to being placed in service.
- Ensure that employees have been trained in the proper use, care and inspection of all Safety equipment.
- Follow-up with employees to be sure they are inspecting their tools and equipment and following the established Safety Requirements and safe work practices. Notify their employees and correct any non-compliance.
- Hold Toolbox Talks with crewmembers and submit the written report to the Safety Coordinator.
- Ensure that prompt first aid is provided for each injured worker and promptly report all accidents to the Safety Coordinator and/or General Contractor/Project Manager.
- Hold daily Safety briefings with their crew to cover any unique Safety and health issues to be faced during the day. Daily reminders of safe work Requirements by the Supervisor are critical to establishing a safe work culture.

3. Competent Persons

The Occupational Safety and Health Administration's (OSHA) Construction Standards, specifically 1926.20(b)(2), require the employer or senior members of **CCG** to designate competent person(s) for this job site.

To comply with the OSHA requirements, the competent person must meet two qualifications:

- Capable of identifying existing and predictable hazards and
- Authorized to take prompt corrective measures to eliminate them.

A Safety And Health Competent Person Assignments sheet is included in Appendix A - Site Forms, to identify circumstances that warrant their appointment. Please reference the applicable OSHA standards for more information on the specific responsibility of each competent person.

4. Project Workers

- Comply with **CCG** Site Safety and Health Plan, the contract documents and all other federal, state and local codes, laws, regulations and standards.
- Perform their work in a safe manner for prevention of accidents to themselves, fellow workers, the general public and property of all concerned.
- Use all personal protective equipment required. Hearing protection is required as determined by the Safety Coordinator. Wearing a hard hat is required at all times on this project.
- Attend their employer's Toolbox Talks and sign the attendance list.
- Be constantly alert for unsafe conditions and avoid unsafe acts that may cause themselves or others injury.
- Alert their Supervisors to hazards, unsafe acts and near misses and notify them immediately of any accident or incident.
- Operate only equipment, machinery, or tools that he/she has been trained to use. When in doubt, ask questions.
- Help to maintain a safe and clean work area.

5. Visitors

Persons not directly involved with the on-site construction shall not enter the site unless they obtain permission from the Supervisor or the Supervisor's designee, sign a Visitor's Release Form and obtain and wear a hard hat, which is to be returned prior to leaving the site. **CCG** representative must escort visitors.



SAFETY MEETINGS

A. SAFETY MEETINGS

Safety meetings for supervisory and management personnel should be held at least monthly. A record of these meetings should be kept on file. The Safety Coordinator shall schedule, distribute notification of, and chair the Safety Meetings.

1. The following persons are required to attend:
 - a. Supervisors, Safety coordinator, assistant supervisors, employee representatives and others at the direction of the Safety coordinator and/or company director.
2. Suggested items of review are:
 - a. A general discussion of overall Safety activities, including outstanding deficiencies that have occurred and been noted.
 - b. Incidents that have happened or conditions that exist that could cause or have caused accidents or injuries should be discussed. When possible, the corrective action necessary should be discussed or resolved at these meetings or daily on an individual need basis.
 - c. Plans should also be made, in anticipation of projected work, to allow for possible Safety problems.

Safety Meeting minutes shall be distributed to all attendees affected employees.

B. TOOLBOX TALKS

Toolbox Safety meetings provide an important means of instruction and training as well as a source of communication between the workers, supervision and management.

Worker attendance is mandatory. Priority should be given to conducting these meetings at the beginning of each workweek or prior to starting a new job.

1. **CCG** Supervisors will hold Toolbox Talks discussing Safety and health topics that are directly related to the work being performed by their crew.
2. The Toolbox Talks will include, as a minimum, the following:
 - a. Instruction of workers in safe and efficient planning and performance of current or expected work.
 - b. Review of accidents, near misses, hazards and unsafe acts that are identified by the Safety Coordinator and how to prevent them from happening again.

- c. Review of the Safety Meeting minutes, as they affect their work.
 - d. All new or current Safety Bulletins.
 - e. Requests for suggestions and comments relating to Safety and health.
3. Toolbox Talks are to be held on _____
(a day and time designated by supervisor).
- ** Additional meetings may be required as special work conditions/situations arise.
4. Written documentation of Toolbox Talks will contain:
- a. Name of project and date.
 - b. Special topics discussed for the project.
 - c. Safety and health comments and suggestions from employees.
 - d. Employees in attendance.
 - e. Name of Supervisor or other personnel that conducted the meeting.
5. The completed, written documentation of each Toolbox Talk will be given to **CCG** Safety Coordinator.



C. NEW HIRE ORIENTATION

Each **CCG** employee on this project is required to attend a Safety orientation prior to starting work. The Safety Coordinator or designee from **CCG** conducts the presentation. **CCG** will maintain written documentation of these Safety orientations. Before beginning work ensure that employees have attended the Safety orientation that includes, as a minimum:

- Description of the project to include potential job hazards.
- Responsibilities of all project employees
- Hazard Communication (HAZCOM) training
- Silica awareness training
- Fall Protection training
- Scaffold training
- Fire Extinguisher training
- Emergency procedures

The Supervisor(s) continues the Safety training of new hires to include as a minimum:
Orientation on potential job hazards:

- Use of special equipment
- Use of hazardous chemicals
- Other specific Safety and health training as appropriate (see the Safety and Health Training Requirements Checklist in the Safety and Health Program Manual).
- The Safety Coordinator maintains employee-training records at **CCG** main office.

EMERGENCY PROCEDURES & ACCIDENT REPORTING

A. EMERGENCY PROCEDURES

1. The name, telephone number, and location of police, fire, hospital, and other agencies whose services might be required, or from whom information might be needed will be kept on the job site in company vehicles or coordinated through the General Contractor/Project Manager, if applicable. Use the Emergency Phone Numbers poster attached at the end of this Safety & Health Plan (see Appendix A).

Any time the Supervisor is absent from the project, the Supervisor must designate a responsible individual as an official representative with full authority to supervise and perform the duties listed below.

In conformance with OSHA requirements, all incidents that result in the hospitalization of 3 or more employees or a fatality shall be reported to OSHA.

2. The following procedures apply to all employee injury or property damage accidents.
 - a. The Supervisor or the Supervisor's designee (_____) will be notified immediately.
 - b. If a head, neck, back or spinal injury is suspected, or the person is unconscious for any reason, the injured person will not be moved. Summon an ambulance to the site.
 - c. For emergency situations, after ensuring that standard first aid procedures are being administered, the Supervisor or designee will:
 - Check the scene
 - Call the proper rescue and emergency units
 - Care for the injured individual(s)
 - Remove non-essential people from the work area. Take photos of the accident area.
 - Secure names of witnesses and facts relating to the accident.
 - Station an individual at the site entrance to escort emergency vehicles and prevent unauthorized personnel into the area and onto the project site.
 - d. The Supervisor or designee will notify the Executive Director and/or Safety Coordinator of CCG.

B. MEDICAL SERVICES

CCG has identified the _____ hospital as the closest primary emergency provider. Any workers suffering minor injuries will be transported to the hospital by company vehicle. Major injuries will be stabilized and transported by ambulance.

C. FIRST AID

1. A first aid kit will be located in the on-site company vehicle or at another pre-designated location. Items that must be kept sterile in the first-aid kit shall be contained in individual packaging. All first-aid kits will contain, but not be limited to, the following items:
 - 1 Pkg. - Adhesive bandages, 1" (16 per pkg.)
 - 1 Pkg. - Bandage compress, 4" (1 per pkg.)
 - 1 Pkg. - Scissors and tweezers (1 each per pkg.)
 - 1 Pkg. - Triangular bandage, 40" (1 per pkg.)
 - 1 Pkg. - Antiseptic soap or pads (3 per pkg.)
2. All employees will be provided with the locations for the first aid kits. Instructions for using first aid equipment are located in each kit.

D. EVACUATION

Some emergencies may require company personnel to evacuate the job site. In the event of an emergency that requires evacuation from the job site, all employees are required to go an area adjacent to the project that has been designated as the "safe area." The safe area for this project is located: **Description of location**. This information should also be coordinated with the General Contractor/Project Manager, if applicable.

E. ACCIDENT REPORTING

1. A preliminary Accident Investigation Report and a copy of the Worker's Compensation Accident Report from the project will be prepared by the Safety Coordinator and distributed within 24 hours to the Executive Director/President. A complete Accident Investigation Report, including photographs, diagrams, and witness statements will be distributed within 72 hours of any serious injury accident.
2. One copy of all Liability Accident Reports or Property Damage Accident Reports will be prepared by the Supervisor or Safety Coordinator and forwarded to the CCG Main Office along with a complete Accident Investigation Report.

F. HAZARD PROTECTION

CCG understands that identifying specific hazards on individual projects is the key to minimizing accidents and injuries. This section identifies those hazards that are known to be part of our construction work.

CCG further understands that no Safety and Health Plan can identify every hazard and exactly when it will occur. Construction projects are dynamic situations. Successful Safety and health planning also involves reacting to new, or unanticipated hazards as the project proceeds. This recognition of new, or changing hazards, and adapting to them is the fundamental role of the competent person. To help identify these potential hazards use the Safety checklists located in Appendix A - Site Forms, of this plan.

The remainder of this section discusses the major hazards and how to control them. **CCG** has identified at this construction project. The applicability of this information will vary, depending on the work to be done and work location, especially with general contractors or other subcontractors.

G. JOB SAFETY ANALYSES

Hazard identification begins with analyses of the specific hazards associated with various operations. This procedure outlines the purpose for and method of Pre-Work Planning--Job Safety Analysis and Safety Task Assignment (STA) that will be required for each project. Prior to the start of each activity the Job Safety Analysis and the Safety Task Assignment will be completed and reviewed. An approved plan must be obtained and the individual workers given their Safety task assignment before any work is to begin.

1. General

Accident prevention preplanning identifies hazards that are likely to occur during a project and makes sure each job will have the necessary material, equipment and properly informed workers on hand when needed. Due to the speed at which our jobs proceed, time does not allow a simple operation to continue long enough to become safe through trial-and-error. To cope with Safety and health problems found in **CCG** projects, this procedure has been established so:

- the hazards can be identified before work begins,
- develop an appropriate plan to prevent the hazards from becoming accidents, and
- to give workers who will actually be performing the job detailed safe work instructions prior to the start of work.

2. Responsibilities:

It is the responsibility of the job supervisor to ensure that the Pre-Work Planning--Job Safety Analysis and Safety Task Assignment (ST A) are done for all work operations and activities performed on **CCG** projects.

- a. The field supervisory personnel who will actually be running the project(s) will develop pre-Work Job Safety Analysis or operation(s) that is (are) being pre-planned. This analysis will be done on the "Job Safety Analysis" form.
- b. The supervisory personnel will consult and coordinate the preparation of pre-phase plans with the Safety Coordinator to ensure their acceptability. In addition, the plans will be reviewed and updated at reasonable periods of time to include unanticipated hazards and changes in job conditions.
- c. The supervisory personnel for **CCG** will personally give to their workers STA training on the details of the Job Safety Analysis the supervisor personnel helped develop. Training will include the proper use of tools and equipment, Safety procedures for the actual task to be performed and the proper use of personal protective items required.
- d. Pre-Work Planning and Job Safety Analysis is to be done immediately prior to beginning of each job.

Under no circumstances is work to begin without first going through the procedure of having the Job Safety Analysis approved and the Safety Task Assignment instructions given to the workers.

3. Safety Task Assistant (STA)

Before assigning workers to any job, new or repetitive, their direct Supervisors must give them the STA--that is, demonstrating and explaining to them the Safety and health precautions and action(s) that must be taken before proceeding with the task. The information the Supervisors are relaying to these workers is the same information they assisted in developing in the Job Safety Analysis for that particular operation.

Note: The Job Safety Analysis form and instructions for completing it are found in Appendix A - Site Forms.

H. HAZARD COMMUNICATION

(Reference OSHA standard 1926.59)

CCG will comply with the OSHA Hazard Communication (HAZCOM) Standard by having a written HAZCOM Program, by compiling a Hazardous Chemical Inventory List for this construction project, by ensuring that hazardous chemical containers are properly labeled, by collecting and using Material Safety Data Sheets (MSDSs), and by training employees as required by the standard.

Under this Program, employees will be informed of the contents of the HAZCOM Standard, the hazardous properties of chemicals with which they work, safe handling and storage procedures, and measures to take to protect themselves from these chemicals. They will also be informed of the hazards associated with non-routine tasks, such as entering a confined space and the hazards associated with chemicals in unlabeled pipes.

Copies of **CCG** HAZCOM program, project Hazardous Chemical Inventory List and the Supervisor or Safety Coordinator will make MSDSs available upon request.

1. Hazardous Chemical Inventory List

The Supervisor or Safety Coordinator will be responsible for completing and updating **CCG** Hazardous Chemical Inventory List and will ensure that it contains all known hazardous chemicals for **CCG** use.

When **CCG** subcontracts work, **CCG** supervisors will submit a copy of the Hazardous Chemical Inventory List to the General Contractor/Project Manager's Safety Coordinator and will submit an updated list whenever there are inventory changes.

2. Labels and Other Forms of Warning

All chemicals used will be stored in their original or appropriate containers that are properly labeled, tagged or marked. **CCG** will rely on manufacturers applied labels, and will ensure that these labels are maintained. Containers that are not labeled or on which the manufacturer's label has been removed or defaced will be re-labeled.

Labels or other forms of warning are required to have at least the following information:

- a. Chemical identity
- b. Appropriate hazard warnings
- c. Name and address of the manufacturer, importer or other responsible party

Labels on hazardous containers will not be removed or defaced and must be in English.

3. Material Safety Data Sheets (MSDSs)

If a container label indicates a hazard, then a MSDS is required and must be requested from the manufacturer or distributor if it is not received. If there are no hazards on the label, OSHA states that the user can assume it is not hazardous and a MSDS is not required. No hazardous chemical will be used until the MSDS is acquired.

CCG will give complete and current MSDS's to the General Contractor/Project Manager's Safety Coordinator prior to or at the time of delivery of all chemicals that may present health and/or physical hazards that will be used by **CCG**.

4. Informing Other Employers

All MSDS's are made available at **CCG** main office.

Employers who produce, use or store hazardous chemicals at a workplace in such a way that the employees of other employers may be exposed, will be responsible for informing these other employers of the identity of the hazardous chemical and any precautionary measures that need to be taken.

A copy of **CCG** written Hazard Communication Program is found in Appendix B.

I. **FALL PROTECTION**

(Reference OSHA standards 1926.500 - .503)

CCG understands that falls are one of the most frequent causes of serious injuries to construction workers. In an effort to prevent falls on our job sites, **CCG** has developed minimum fall protection Requirements for all jobs. Employees must be protected from falling when on a walking or working surface that is 6 feet or more in height. The employee shall be protected by the use of a:

- Guardrail System,
- Safety Net System, or
- Personal Fall Arrest System.

1. Guardrail Systems

- a. Install guardrails around open sides or ends of walking/working surfaces, holes, ramps, runways, or other walkways when there is a potential fall of 6 ft. (1.8m) or more.

- b. The top edge height of guardrails shall be 42 inches ± 3 inches (1.1m ± 8cm) above the walking/working surface and made of wood 2 x 4's or cable at least ¼ " thick.
- c. Mid-rails, screens or mesh shall be installed midway between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet at least 21 inches (53 cm) high.
- d. Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890N) applied within 2 inches (5.1 cm) of the top edge in any outward or downward direction at any point along the top edge.
- e. Mid-rails, screens and mesh shall be capable of withstanding, without failure, a force of at least 150 pounds (666N) applied in any downward or outward direction at any point along the mid-rail or other member.
- f. Guardrail systems shall be so surfaced as to prevent injury, from snagging, punctures, etc.
- g. If wire rope is used for guardrail systems, it shall be flagged at not more than 6 feet (1.8 m) with high visibility material.
- h. When guardrail systems are used for hoisting areas, a chain, gate or removable guardrail section must be in place when hoisting operations are not taking place.
- i. When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. Excess materials and debris must be kept clear of the working area - remove at regular intervals.
- j. Steel banding and plastic banding shall not be used for top rails or mid-rails.

2. Safety Net Systems

- a. Safety nets shall be installed as close as practicable under the walking/working surface on which employees are working but in no case more than 30 (9.1 m) feet below that level.
- b. Safety nets shall extend outward from the outermost projection of the work surface at least 8 feet, depending on the height of the fall.
- c. Safety nets and Safety net installations shall be drop tested after initial installation and before being used as a fall protection system, whenever relocated, after major repair and at 6-month intervals if left in one place.

- d. Drop tests shall consist of a 400 pound (180 kg) bag of sand, 30 ± 2 inches (76 ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards but not from less than 42 inches (1.1 m) above that level.
 - e. Defective nets shall not be used. Materials, scrap pieces, equipment and tools that have fallen into the net shall be removed as soon as possible.
 - f. Consult the manufacturer for proper installation of nets.
3. Personal Fall Arrest Systems
- a. Body belts are not acceptable as part of the Personal Fall Arrest System, only body harnesses are to be used.
 - b. Personal Fall Arrest Systems, when stopping a fall, shall:
 - 1. Limit the maximum arresting force on an employee to 1,800 pounds (8kN) when used as a body harness.
 - 2. Be rigged so that employees can free fall no more than 6 feet (1.8m) nor contact any lower level.
 - 3. Bring an employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet (1.07 m).
 - 4. Have sufficient strength to with stand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m).
 - c. Personal fall arrest systems shall be inspected prior to each use.
 - d. Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service.
 - e. Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached or shall be used as follows:
 - 1. As part of a complete personal fall arrest system that maintains a Safety factor of at least two.
 - 2. Under the supervision of the qualified person (_____).
 - f. Personal fall arrest systems shall not be attached to guardrail systems nor shall they be attached to hoists except as specified in the standard.
 - g. All connectors shall be drop forged, pressed or formed steel or made of equivalent materials. Connectors shall have a corrosion-resistant finish

and all surfaces and edges shall be smooth to prevent damage to interfacing parts.

- h. Only locking type snap-hooks shall be used.
- i. Horizontal lifelines shall be designed, installed and used under the supervision of the qualified person (_____).
- j. Each employee shall be attached to a separate lifeline. Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds (22.2 kN).
- k. For situations where lifelines are interrupted, double lanyards are necessary to ensure that the worker is continuously protected from falling by attaching one lanyard ahead of the discontinuity prior to unhooking the trailing lanyard.
- l. The attachment point of the body harness shall be located in the center of the wearer's back near the shoulder level or above the wearer's head.
- m. When personal fall arrest systems are used in the hoist areas, they shall be rigged to allow movement of the employee only as far as the edge of the walking/working surface.

4. Covers

Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements:

- a. All other covers shall be capable of supporting without failure at least twice the weight of the employees, equipment and materials may be imposed on the cover at anyone time.
- b. All covers shall be secured in place.
- c. All covers shall be color-coded or be marked with the word "hole" or "cover" to indicate a warning of the hazard.
- d. For the purpose of this section a hole/opening is considered 4" x 4".

5. Falling Object Protection

Protection from falling objects shall comply with the following provisions:

- a. Toe-boards, when used as falling object protection shall be erected along the edge of the overhead walking/working surface to protect employees below.

- b. Toe-boards shall be capable of withstanding, without failure, a force of at least 50 pounds in a downward or outward direction.
- c. Toe-boards shall be a minimum of 3 ½ inches in height above the walking/working surface.
- d. When canopies are used as falling object protection, they shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto the canopy.

6. Training Requirements

- a. Training shall be provided for each employee who might be exposed to fall hazards. Training shall enable each employee to recognize fall hazards and to understand the procedures to be followed to minimize these hazards.
- b. Written certification of this training shall be maintained for each employee.
- c. Retraining shall be done when a supervisor believes an employee does not have the proper understanding or skills required to recognize fall hazards or understand the proper procedures for fall protection.

J. HAND AND POWER TOOLS

(Reference OSHA standards 1926.300 - .307)

Tools are such a common part of construction work that it is difficult to remember that they may pose hazards. Therefore, in an effort to minimize accidents **CCG** will implement and enforce the following safe work procedures.

1. General Requirements:

- a. Maintain all hand tools and equipment in safe condition and check regularly for defects. Do not use broken, defective, burned or mushroomed tools. They should be tagged and taken out of service immediately, until properly repaired.
- b. Appropriate personal protective equipment will be used depending upon the situation. For example, workers using electric tools will wear gloves and Safety footwear; eye protection (and face protection, if necessary) will be used when operating drills, saws, grinders, or other tools that may throw particles and injure a worker; effective hearing protection will be worn when operating noisy equipment like jackhammers.
- c. Only qualified operators will operate power tools and equipment in accordance with the manufacturers' instructions for proper and safe usage. Tool and

equipment operators will also be trained regarding the proper use of tools and the recognition of Safety hazards associated with the different types of tools.

- d. Always use the proper tool and equipment for any task you may be assigned to do. For example: do not use a wrench as a hammer or a screwdriver as a chisel.
- e. Do not leave tools on scaffolds, ladders or any overhead working surfaces. Racks, bins, hooks, or other suitable storage space will be provided.
- f. Throwing tools from one location to another, from one employee to another, or dropping them to lower levels, is prohibited. When necessary to pass tools or material under the above conditions, suitable containers and/or ropes will be used, not cords.
- g. Only non-sparking tools will be used in locations where sources of ignition may cause a fire or explosion.
- h. Tools designed to have guards must be equipped with them when in use.
- i. All rotating, reciprocating or moving parts of equipment (belts, gears, shafts, fly heads, etc.) must be guarded to prevent contact by employees using such equipment. Guarding must meet Requirements set forth in ANSI B15.1-1953.
- j. All hand-held power tools (e.g., circular saws, chain saws, and percussion tools) without a positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when pressure is released.
- k. A momentary contact "on-off" control must be provided on all hand-held powered drills, tapers, fasteners drivers, horizontal, vertical and angle grinders with wheels greater than 2 inches in diameter.
- l. A Ground Fault Circuit Interrupter (GFCI) must be used or the tool must be double- insulated to prevent the worker from electrical shock hazards. ~ remove the third prong from the plug.
- m. Trained and experienced personnel must only use pneumatic and powder-actuated tools. Require proper eye protection for workers.
- n. Never leave cartridges for pneumatic or powder-actuated tools unattended. Keep equipment in a safe place, according to the manufacturers' instructions.
- o. Only assigned, qualified operators will operate power, powder-actuated or air driven tools.
- p. Electric tools should not be used in damp or wet locations.

- q. Never stand directly in front of an abrasive wheel during start-up because there is always a possibility that the wheel may disintegrate (explode) when accelerating to full speed. Portable grinding tools need to be equipped with Safety guards to protect workers from flying fragments as well as the moving wheel surface.
- r. When using pneumatic tools, check to see that they are fastened securely to the hose to prevent them from becoming disconnected. All hoses exceeding 1/2 inch inside diameter must have a Safety device at the supply source or branch line to reduce pressure in the event of hose failure.
- s. A Safety clip or retainer must be installed on pneumatic tools to prevent attachments from being unintentionally shot from the barrel of the tool.
- t. Do not load a powder-actuated tool unless it is to be used immediately. Never leave a loaded tool unattended, especially where it would be available to unauthorized persons.

K. ELECTRICAL PROTECTION

(Reference OSHA standards 1926.400 - .449)

Electricity is a serious workplace hazard that must be respected at all times. It is important to remember that even a little electric current can kill. The best protection around electricity is distance - ample distance between the worker and the conductive materials. The following safe work procedures will be implemented and enforced on this construction project.

1. General Requirements

- a. Ensure that employees know what electrical equipment they are authorized to use - know what parts of automotive electrical systems they can work on and what jobs must be performed by qualified personnel.
- b. Be alert to and strictly obey all warning and danger signs around electrical apparatus. Do not close a switch that has a danger tag on it signed by or placed there by someone else.
- c. Do not use extension cords or any power tools or equipment when the cords are frayed, worn out or the wires are bare. Turn the equipment in for repair.
- d. Temporary lights shall be equipped with heavy-duty electric cords with connections and insulation maintained in a safe condition. Splices shall have insulation equal to that of the cable.

- e. Extension cords shall not be fastened with staples, hung from nails, suspended by wire or suspended from any material or equipment capable of conducting electricity.

2. Lockout and Tagging of Equipment

- a. Equipment or circuits that are de-energized must be rendered inoperative through a lockout system and have tags attached at all points where such equipment or circuits can be energized.
- b. Tags must have the name of the person and the date that work is being performed. The person who placed it on the equipment may only remove the tag.

3. Assured Equipment Grounding Conductor Program/Ground Fault Circuit Interrupters

To insure Safety from electrical shocks on **CCG** projects, all 120 volt, single- phase, 15- and 20-amp receptacle outlets must be protected by ground fault circuit interrupters (GFCIs) or an assured equipment grounding conductor program will be established. The competent person (_____) must implement and enforce the assured equipment grounding Safety procedures.

- a. Each 120 volt extension cord, tool, piece of equipment and receptacle needs to be inspected and test by a designated individual (_____):
 - 1) Before the first use
 - 2) Before equipment is returned to service following repairs
 - 3) Before equipment is used after any incident which may have caused damage.
 - 4) Every three months
- b. The purpose of the inspection and testing is to assure:
 - 1) A continuous ground circuit
 - 2) That the equipment conductors are connected properly
 - 3) That there is no ground fault
 - 4) That the cord is "heavy duty" for construction
- c. The user before each day's use to identify any damage should visually inspect each extension cord, tool or piece of equipment.
- d. Equipment found to be damaged or defective (frayed or damaged insulation, crushed cable, loose or missing covers or screws, and missing ground prongs, etc.) must not be used until repaired.
- e. Equipment suspected to be damaged or defective should be inspected and tested prior to use.

- f. To verify inspection and testing a piece of color coded tape may be attached each time equipment is inspected. Four colors of tape will be used, one for each quarter of the year. The color coding system is as follows:

Color	Quarter	Expiration Date
White	First	March 31
Green	Second	June 30
Red	Third	September 30
Orange	Fourth	December 31

Brown will be used to verify that repair is needed

- g. Inspection tape must not be used for any other purpose. The Superintendent or Site Safety Coordinator will strictly control storage of tape.
- h. Only persons designated by the supervisor are authorized to remove inspection tape. Unauthorized removal or defacing of inspection tape will be cause for disciplinary action.

4. Overhead Transmission and Distribution Lines

Where work must be done near live lines, the movement of all equipment such as cranes, hoists, derricks, elevators and other equipment must be guided by an observer who can see the clearance of the equipment from energized lines and give timely warning to equipment operators. The minimum clearance between live lines and any work site equipment is 10 feet, and the clearance increases with increasing line voltages.



L. SCAFFOLDS

(Reference OSHA standards 1926.450-.454)

The use of scaffolding is a common occurrence on our projects. However, for scaffolding to perform its intended purpose there are several points that need to be covered prior to, during and after erection. CCG policy requires that the following scaffolding policies/procedures be followed.

1. General Requirements

a. Before doing any work while on a scaffold, inspect visually to determine that:

- Guardrails, toe-boards and full decking are in place.
- The scaffold is secured from movement (e.g., tied-off if 4: 1, casters locked).
- All braces and locking pins are in place.
- No makeshift items (e.g., bricks) are used to level the scaffold.
- Access is provided (e.g., ladders, built-in).

Note: use the checklist in Appendix A - Site Forms, to perform a more complete inspection.

b. All scaffolds shall be designed by the qualified person (_____) and constructed, altered, moved, or dismantled only under the supervision of the competent person (_____).

c. The competent person shall inspect scaffolds, their components and ropes on suspension systems before each work shift and make any necessary corrections.

d. Each employee on a scaffold that is more than 10 feet (3.1m) above a lower level must be protected from falling to that lower level by a guardrail system and/or personal fall arrest.

e. Do not alter any scaffold member by welding, burning, cutting, drilling or bending.

f. Do not stack brick, tile, block or similar materials higher than 24 inches on the scaffold deck.

g. Do not use parts from one type of scaffold or scaffolding system with those of another.

h. Ladders, boxes, or other materials shall never be used to increase the working level of any scaffold platform.

i. Do not change or remove scaffold members unless authorized to do so.

- j. Do not climb on, or work from any handrail, mid-rail or brace member of any scaffold.

2. Supported Scaffolds

- a. No one shall use cross-braces to access any scaffolds. All scaffolds must be equipped with a proper access system, such as a ladder, when the platform is more than 2 feet above/below another level.
- b. All scaffolds must be erected level and plumb and placed on a firm base for support. Do not use concrete blocks, barrels, or boxes for support.
- c. Scaffolds must be tied off or otherwise stabilized when the height to base-width ratio exceeds 4 to 1. Scaffolds must also be tied-off every 30 feet horizontally and/or 26 feet vertically.
- d. The working deck of the scaffold must be thoroughly planked or decked ("scaffold grade" lumber) while you are working. Scaffold planks must be cleared and must extend over the end supports at least 6 inches - but not more than 12 inches. Under no circumstances will regular or framing grade lumber be used for decking on the scaffold.
- e. All materials shall be hoisted onto the scaffold by means of a hand-line or similar apparatus. Workers will carry no materials up the ladder.
- f. No one is allowed to ride on a mobile scaffold when it is being moved. Remove or secure all tools and materials on the deck before moving.
- g. All workers involved in erecting or dismantling supported scaffolds are required to use fall protection, as long as the competent person determines it does not create a greater hazard.

3. Suspension Scaffolds

- a. Bolts shall stabilize scaffold outrigger beams or other direct connects to the floor or roof deck or counterweights shall be used.
- b. Counterweights and outrigger beams used on suspension scaffolds must be able to support at least 4 times the weight of the system, materials, workers, etc.
- c. Only items designed as counterweights shall be used as such. Never use sand, gravel, or other materials as a counterweight.

- d. Counterweights not secured to the floor or roof deck by direct connections shall be secured by tiebacks. Sound anchorage for tiebacks includes the building structural members, but not standpipes, vents, electrical conduit, etc.
- e. Vertical lifelines and suspension ropes shall not be attached to each other or use the same point of anchorage. Vertical lifelines shall be fastened independent of the scaffold to a safe point of anchorage that includes structural members of buildings, but not vents, piping systems, electrical conduit, outrigger beams, etc.

4. Training

- a. All employees required to perform work while on a scaffold shall be trained by a qualified person to understand and recognize the hazards of the system being used and how to control them.
- b. All employees whose work involves building, moving, altering, dismantling, etc., scaffolds shall be trained by a competent person to recognize any hazards associated with that work.
- c. If an employee shows lack of understanding or skill needed for any scaffold work or new scaffold systems are introduced each employee shall be retrained.

M. TRENCHING AND SHORING

(Reference OSHA standards 1926.650 - 1926.652)

The following are basic Requirements to be used during any trenching and shoring operation.

1. General Requirements

- a. Surface encumbrances that could create hazard to employees shall be removed or supported as necessary to safeguard employees.
- b. **Underground installations:** sewer, telephone, fuel, electric, water lines, or any other underground installations must be located prior to start of actual excavation.
 - Utility Companies/Owners shall be contracted within established local response times, advised of proposed work and asked to identify locations of underground installations.
 - Once located, a designated person should mark locations with stakes noting depth and type of utility.
 - The Supervisor conducting excavation work should notify the equipment operator and crew of the depth and type of underground installations.
 - Utilities should be de-energized, removed or supported to prevent a hazard to employees.

- Utility lines should be located by hand digging.

c. **Access and Egress**

A competent person shall design structural ramps used by employees, or if used by equipment, the structural design will be by a structural engineer.

- Structural ramps shall be either cleated or have a non-slip surface treatment.
 - Means of egress from trench excavations (if 4 or more feet in depth) will have a stairway, ladder, or ramp located within 25 feet of employees working in the excavation/trench.
- d. Exposure to vehicular traffic: Employees exposed to traffic hazards will wear warning/reflective vests.
- e. No employee shall be permitted underneath loads handled by lifting or digging equipment.
- f. Stop logs or other warning systems will be used for equipment required to approach the edge of excavation. Employees shall be moved back to a safe location while equipment is close to the edge of excavation.
- g. **Hazardous atmospheres:** The atmosphere in excavations more than 4 feet deep will be tested if a suspect hazardous atmosphere could exist. Especially in excavations around landfills or where hazardous materials are stored. Oxygen levels must be at least 19.5% and no more than 20 percent of the lower flammable limit of gases shall be present. Appropriate rescue equipment must be available and tested when required by hazardous atmospheric conditions.
- h. Employees shall not work in an excavation in which there is accumulated water, or in excavations in which water is accumulating.
- i. Where stability of adjoining buildings, walls or other structures is endangered by excavation operations, support systems such as shoring, bracing or under pinning shall be provided.
- j. Protection of employees from loose rock or soil.
- Protection shall consist of scaling to remove loose materials and installing protective barricades as necessary on the face to stop and contain falling materials.
 - Keeping spoil material at least 2 feet from the edge of excavations shall provide protection.

k. Inspections

- Daily inspections of excavations: the adjacent areas and protective systems shall be made by a competent person (see the Excavation Check List in the Attachments).
- An inspection shall be conducted by the competent person (_____) prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence.

l. Fall Protection

- Where employees or equipment are required or permitted to cross over excavations, walkways or bridges, standard guardrails will be provided.
- Adequate barrier (42 ± 3 in.) for physical protection shall be provided at all excavations. Barricades must be kept back at least 5 feet from the edge of the excavation or hole.

2. Requirements For Protective Systems

- a. The competent person should classify the soil type in accordance with the following definitions.

1) **Stable Rock:** A natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. A common misconception is that all rock is stable; most is not because it is fractured, fissured, faulted and bedded.

2) **Type A:** Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty and sandy clay loam. Cemented soils such as hardpan are also considered Type A. However, no soil is Type A if:

- It is fissured.
- The soil is subjected to vibration from heavy traffic, pile driving or similar effects.
- The soil has been previously disturbed.
- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical or greater.
- The material is subjected to other factors that would require it to be classified as a less stable materials.

NOTE: The exclusion for Type A soil eliminates its use in most typical construction situations.

3) **Type B** is defined as:

- Cohesive soil with an unconfined compressive strength greater than 0.5 TSF by less than 1.5 TSF.
- Granular cohesion-less soils including: angular gravel, silt, silt loam, sand loam and, in some cases, silty and sandy clay loam.
- Previously disturbed soils except those that would be classified as Type C soil.
- Soil that meets the unconfined compressive strength or cementation Requirements of Type A, but is fissured or subjected to vibrations.
- Dry rock that is not stable.
- Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical but only if the material would otherwise be classified as Type B

NOTE: Most soils fall into this category until they become predominantly granular or saturated, at which time they become Type C

4) **Type C** is defined as:

- Cohesive soil with an unconfined compressive strength of 0.5 TSF or less.
- Granular soils including gravel, sand and 10an1Y sand.
- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.
- Materials in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical or steeper.

b. **Soil type** must be determined by at least one manual and one visual test. See Excavation Check List.

c. **Sloping:** There are four options:

- 1) Slope to the angle required by the standard for Type C, which is the most unstable soil type.
- 2) Use the tables provided in OSHA standard 1926.652(b) to determine the maximum allowable angle (after determining the correct soil type).
- 3) Use tabulated data prepared by a Registered Professional Engineer.
- 4) Have a Registered Engineer design a sloping specifically for that job. A trench over 20 feet in depth requires the services of a Registered professional Engineer if sloping is to be used.

d. **Shoring:** Shoring is the second means of providing cave-in protection. In shoring, the sides of the excavation are braced up by structural components whose strength is sufficient to prevent a cave-in.

Types of shoring

- Timber Shore
- Screw Jacks
- Aluminum Pneumatic shores (Air shores)
- Aluminum Hydraulic Shores
- Sheet Pile

If a Trench Box is used it must protrude 18 inches above the ground level edge or point of transition from vertical to a slope. You may gain these 18 inches if needed by raising and supporting the trench box off the bottom of the trench. However, a maximum of 24 inches is allowed between the bottom of the box and the bottom of the trench.

N. CONFINED SPACES

(Reference OSHA standard 1910.146)

This section contains Requirements for practices and procedures to protect employees from the hazards of confined spaces. A confined space is a space that has a limited opening for entry and exit, unfavorable natural ventilation or an area that is not designed for continuous worker occupancy.

1. General Requirements

- a. The Supervisor will evaluate the job site to identify if any spaces are permit required. Use the attached "Permit-Required Confined Space Decision Flow Chart" or the one in Appendix A of 1910.146.
- b. Post warning signs at the entrance of all confined spaces. A sign stating "Danger - Permit-Required Confined Space, Do Not Enter" in large bold letters should be posted.
- c. A hazard evaluation must be conducted before any work is started in a confined space. This evaluation will include physical hazards as well as atmospheric hazards, such as oxygen content, flammable gases, and toxic air contaminants. Use Appendix B of 1910.146 as a rule when conducting atmospheric testing.
- d. **CCG** Safety Coordinator will develop and implement a written Permit- Required Confined Space entry program in accordance with 1910.146(d).
- e. A confined space entry permit must be completed and signed by the Supervisor and Safety Coordinator prior to entry into a confined space. Use the entry permit (see Appendix A - Site Forms) or the samples found in Appendix D of 1910.146.
- f. Designate the people who are to have active roles (i.e., entrants, attendants, entry supervisors) in confined space entry operations and identify their duties.

- g. **CCG** shall provide training to enable employees to acquire the understanding, knowledge and skills necessary for the safe performance of the duties assigned to them.
- h. **CCG** Supervisor will inform other contractors or subcontractors about the Permit-Required Confined Space entry program Requirements and any precautions or procedures for protection of their employees in or near the confined space.
- i. Attendants or other personnel should not enter a confined space to perform a rescue if not properly trained in the procedure or without the necessary rescue equipment. This is because over 50% of all confined space deaths are would-be rescuers.

2. Equipment

The following equipment shall be provided, at no cost to the workers. **CCG** shall ensure that employees are trained to use the equipment properly and ensure that all equipment is properly maintained.

- a. Testing and monitoring equipment shall be supplied for surveillance of air quality.
- b. Ventilating equipment shall be supplied to obtain acceptable air quality levels if needed.
- c. Effective communications shall be supplied between the entry area and those assigned to stand-by on the outside of the entry areas.
- d. Personal protective equipment shall be supplied when the use of engineering controls, such as constant ventilation, are not effective or adequate.
- e. Proper lighting equipment shall be supplied to enable employees in the entry area to perform their work safely and also exit the area quickly.
- f. Provide equipment, such as ladders for safe access and egress to the confined area.
- g. Provide appropriate rescue and emergency equipment and coordinate emergency proceedings with local rescue services. As a minimum there should be a first-aid kit ready for use on the surface and at least 1 lifeline and Safety harness should be available at the bottom of the entrance.

3. Duties Of Entrants:

CCG shall ensure that all authorized entrants:

- a. Know the hazards that may be faced during entry, including information on the type, signs and symptoms of exposure.
- b. Properly use equipment as required.
- c. Communicate with the attendants as necessary to enable the attendant to monitor the entrant's condition and enable the attendant to alert entrants of the need to evacuate the space.
- d. Evacuate the permit space whenever ordered to do so by the attendant, the entry supervisor or when any type of evacuation alarm is activated.

4. Attendants Duties:

CCG shall ensure that each attendant:

- a. Knows the hazards that may be present during entry including signs, symptoms and consequences of exposure.
- b. Continuously maintains an accurate count of entrants in the permit space, by name, social security number, etc.
- c. Remains outside the permit space during entry operations until the work is completed or relieved by another attendant.
- d. Communicates with entrants as necessary to monitor their status and alert entrants to evacuate when:
 - The attendant detects a prohibited condition.
 - The attendant detects behavioral changes in the entrant(s)
 - A situation outside the space could endanger the entrants.
 - The attendant cannot effectively and safely perform all the duties of his job.
- e. Summons rescue and other emergency services as soon as the attendant determines that the entrants may need assistance to escape from the permit space.
- f. Performs no other duties that may interfere with the attendants' primary duty to monitor the permit space and protect the entrants.
- g. Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - Warn the unauthorized person(s) that they must stay away from the permit space.
 - Advise the unauthorized person(s) that they must exit immediately if they have entered the permit space.

- Inform the authorized entrants and the entry supervisor if unauthorized persons entered the permit space.

5. Entry: Supervisor's Duties:

CCG shall ensure that each entry supervisor:

- Knows the hazards that may be encountered during entry, including the type and signs or symptoms of exposure.
- Verifies, by checking, that the appropriate entries have been made on the permit, that all tests required by the permit have been conducted and that all procedures and equipment specified by the permit are in place before signing the permit to allow entry.
- Verifies that rescue services are available and that the means for calling them is operable.
- Cancels the permit and/or terminates entry when the entry work is complete or a condition that is not allowed under the permit specifications arises in or around the confined space.

O. HEARING PROTECTION

(Reference OSHA standards 1926.52 & .101)

Exposure to high noise levels could be a potential problem because of the nature of our work. Periodic evaluations of workplace noise should be conducted to determine if CCG employees are exposed to hazardous noise levels, according to the following table.

PERMISSIBLE NOISE EXPOSURES

Duration per day (Hours)	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

A basic hearing conservation program must include the following:

- Monitoring Program: A noise-monitoring program will be developed and implemented at this project whenever monitoring results indicate that an employee's exposure may equal or exceed an 8-hour time-weighted average of 90 decibels. Monitoring of employees or work areas should be done to identify employees that should be included into the hearing conservation program and also determine what type of hearing protection to use. Trained company personnel or contracted services will perform this monitoring.
- Employee Notification: Employee's exposed at or above an 8-hour time-weighted average of 90 decibels will be notified of the results of the monitoring. Employees working in excessively noisy areas or doing noisy tasks must wear hearing protection. Ear protection devices inserted in the ear must be fitted or determined individually by a competent person. Earmuffs or plugs should be used for operations where the employee is exposed to excessive noise levels for extended periods of time. Cotton is not an acceptable substitute for prescribed hearing protection.
- Observation of Monitoring: Affected employees or their representatives will have the opportunity to observe any noise measurements.
- Audiometric Testing Program: Audiometric testing will be provided to all employees whose exposures equal or exceed an 8-hour time-weighted average of 90 decibels. A licensed or certified audiologist will perform these tests, otolaryngologist, or other physician or technician certified by the Council of Accreditation in Occupational Hearing Conservation. NOTE: All noise monitoring and audiometric testing records MUST be retained as part of employees' medical records.

To comply with OSHA requirements, **CCG** will develop a hearing conservation program whenever any employee(s) exposure to noise exceeds the levels indicated in the previous table. Further guidance for developing and implementing a Hearing Conservation Program can be found in Appendix C. (Specific, additional Requirements for a hearing conservation program can be found in 29 CFR 1910.95 - Occupational Noise Exposure.)

P. SILICA

Exposure to silica may be a potential hazard on **CCG** projects since concrete and masonry contain silica in the form of quartz (sand). Activities such as sawing, chipping, hammering, and drilling or dry sweeping and pressurized air blowing of concrete, rock, or sand dust could provide an exposure to silica.

Employees must be protected from the silica hazards created during certain activities because exposures to silica exceeding exposure limits might occur. The current silica dust permissible exposure limit established by OSHA is $10 \text{ mg/m}^3 / (\% \text{SiO}_2 + 2)$.

CCG will use effective work practice controls to reduce dust exposures. A simple control may work. However, OSHA requires administrative or engineering controls to be used whenever possible. **CCG** will use the following control methods on this project to control exposures:

- Use engineering controls such as water sprays for wet cutting, blasting cabinets, and ventilation of containment structures. (For example, a water hose to wet dust down at the point of generation.)
- Always use the dust control system and keep it in good maintenance.
- If possible, employees should change into disposable or washable work clothes at the worksite; shower (where available) and change into clean clothing before going home.
- Do not eat, drink, use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica.
- Wash hands and face before eating, drinking, smoking, or applying cosmetics outside of the exposure area.
- Use abrasives containing no silica whenever possible or less than 1% crystalline silica during abrasive blasting to prevent harmful quartz dust from being released into the air. The use of other abrasive blasting materials can create dust hazards as well. Most substitute materials have a PEL of 5 mg/m³ for the respirable fraction or 15 mg/m³ for the total dust.
- Use dust collection systems that are available for many types of dust generating equipment. Use local exhaust ventilation to prevent dust from being released into the air.
- Know the work operations where exposure to crystalline exposure may occur.
- Use type CE positive pressure abrasive blasting respirators for sandblasting.
- For other operations where respirators may be required, use a respirator approved for protection against crystalline silica-containing dust. Do not alter the respirator in any way. Workers who use tight-fitting respirators cannot have beards or mustaches that interfere with the respirator seal to the face.

However, if engineering, work practice, and administrative controls are not used or are not effective enough to fully control exposures to levels below the permissible exposure limit. **CCG** will implement a crystalline silica control program. This program will include the following elements:

1. An ongoing personal air monitoring program*
2. An ongoing medical surveillance program
3. Providing training and information to workers on crystalline silica*
4. Making available air and medical surveillance data to workers*
5. An effective respiratory protection program*
6. Providing and requiring the use of hygiene facilities and clothing change areas
7. Appropriate record keeping*
8. Instituting an effective housekeeping program*
9. Establishing a Safety and health program*
10. Establishing regulated areas

* Required by specific OSHA standards if an overexposure to crystalline silica exists.

Respirators should only be used after dust controls are in place. Respirators should not be the primary method of protection. If engineering or administrative controls cannot keep dust levels below permissible exposure levels then respirators should be used. When respirators are used OSHA requires a comprehensive respiratory protection program. Respiratory protection programs are outlined in OSHA standard 1926.134.

In May 1996 OSHA began a Special Emphasis Program (SEP) for silicosis. The Special Emphasis Program directed OSHA area offices and those states that have their own plan to begin targeted inspections in industries where silica exposures are found. This program provides OSHA compliance Safety and health officers with the information and guidance necessary to establish an inspection list of workplaces where exposure to crystalline silica may exist. OSHA inspections will be focused to particular establishments where over-exposures to crystalline silica are most likely or there are known cases of silicosis.

The following list of standards include those that may, under appropriate inspection conditions, be cited for crystalline silica overexposure under this Special Emphasis Program.

OSHA Requirement	Construction Standard
Respiratory Protection	1910.134
Permissible exposure limit and controls	1926.55 & .57
Accident prevention and warning signs	1926.200
Access to employee exposure and medical records	19.26.33
OSHA 200 forms	1904, 1926.22
Abrasive blasting, breathing air, enclosures, controls	1926.28, .55, .95, .100-.103, & .300
Hygiene	1926.27 & .51
General PPE	1926.28, .95, .100-.105
Hazard Communication	1926.59
Safety and Health Program	1926.20
General Training	1926.21

Further guidance on developing and implementing a Silica Protection Program can be found in Appendix D.

Q. RESPIRATORY PROTECTION

(Reference OSHA standard 1910.134)

CCG will establish and maintain a respiratory protection program whenever effective engineering or administrative controls are not feasible to prevent inhalation of harmful substances. **CCG** has designated (_____) to act as the administrator of the respiratory protection program to ensure its effectiveness in protecting our employees.

In accordance with OSHA standards, the Requirements will be implemented and enforced as part of an effective respiratory protective program at this construction project.

1. Procedures for selecting respirators for use at _____ work site.
2. Medical evaluations of employees required to wear respirators
3. Fit testing procedures for tight-fitting respirators
4. Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
5. The proper ways to clean, disinfect, store, inspect, repair, discard, and maintain respirators.
6. Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators.

7. Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations
8. Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and the maintenance
9. Procedures for regularly evaluating the effectiveness of the program

When selecting respirators to be worn at this construction project, the following factors must be considered:

- The respiratory hazards that exist, such as chemical toxicity and concentration
- Workplace and user factors that affect respirator use, such as physical work Requirements and conditions

Before any employee is required to wear a respirator, the employee(s) must be fit tested with the same make, model, style, and size that will be used. A sufficient number of respirator models and sizes shall be provided so that the respirator is acceptable to and correctly fits the user.

All employees will wear respiratory protective devices at all times when exposed to hazardous materials and/or dangerous atmospheres. This will be strictly enforced. Only NIOSH certified respirators shall be worn by workers, and used in accordance with the conditions of its certification.

Further guidance on developing and implementing a Respiratory Protection Program can be found in CCG RESPIRATORY PROTECTION PROGRAM.

CCG WRITTEN HAZARD COMMUNICATION PROGRAM

A. INTRODUCTION

CCG is committed to providing each of its employees a safe and healthy work environment. Construction processes and other operations performed at various jobsites sometimes require the use of materials and chemicals that can be hazardous, if not handled properly. When using these substances, it is important that workers are aware of the identity of the substances, as well as the toxic or other hazardous properties of the chemicals; since an informed employee is more likely to be a careful employee.

Therefore, in an effort to promote and maintain jobsites that are free from controllable Safety and health hazards, **CCG** has implemented this Hazard Communication Program to protect its employees.

The success of this Hazard Communication Program depends to a great extent upon the cooperation of every employee. Active employee participation in **CCG** Hazard Communication Program will result in the continued reduction of the incidence of chemical related illnesses and injuries at our jobsites and facilities. This written program will be available at the jobsite for review by any interested employee. A master copy of this program will also be maintained at **CCG** main office.

B. CHEMICAL INVENTORY

The Safety Coordinator is responsible for developing and compiling a hazardous chemical inventory list that identifies all hazardous chemicals used by **CCG** employees. This list, attached to this appendix, will be updated periodically to ensure completeness.

The list will also be available for employee information. Copies will be provided to any **CCG** employee or his/her authorized representative upon request to the Safety Coordinator.

C. MATERIAL SAFETY DATA SHEET (MSDS) POLICY

The Safety Coordinator has the overall responsibility for acquiring the MSDSs. He/She will ensure that procedures are developed to obtain the necessary MSDSs for all substances and chemicals that are known to pose a health or physical hazard to employees who are exposed to them. He/She will review all incoming or updated MSDSs for new or significant health and Safety information and pass it on to affected employees. A master copy of all complete and current MSDSs will be maintained and updated as necessary by the Safety Coordinator.

The Safety Coordinator will assign responsibilities to appropriate on-site supervisory personnel for MSDS maintenance at each jobsite. He/She will ensure that current MSDSs

for all chemicals and substances at the site are available to employees. If an MSDS is not available upon request, the Safety Coordinator should be contacted. Periodically, site personnel shall check the MSDS collection for completeness.

All hazardous chemicals used on this job shall have an MSDS attached to this appendix.

D. CONTAINER LABELING POLICY

The Safety Coordinator is responsible for adopting and enforcing **CCG** in-house labeling system. In general, **CCG** will rely on the manufacturer's applied labels whenever possible and will ensure that these labels are maintained in a legible condition. Containers which are not labeled or on which the manufacturer's label has been removed will be relabeled. Supervisors will ensure that each container, on their jobsite(s), is labeled with the identity of the hazardous chemical contained and any appropriate hazard warnings.

The Safety Coordinator will verify that all containers received from manufacturers, suppliers, or importers used by employees are clearly and appropriately labeled. All chemicals on site will be stored in their original or approved containers with proper label attached. Any container not labeled should be given to the Safety Coordinator for labeling or proper disposal. Workers may dispense chemicals from non-original containers only in small quantities intended for immediate use. Any chemical left after work is completed must be returned to the original container. At no time should any unmarked containers of any size be left in the work area after work is completed. The Supervisor has the responsibility of monitoring and notifying the Safety Coordinator of any on-site deficiencies that occur during day-to-day operations.

E. EMPLOYEE INFORMATION

Employees will be informed of, and will have access to, all relevant information, including this document and the standard itself, which can be found on the jobsite or in the office of the Safety Coordinator. MSDSs are located in master copy form in the Safety Coordinator's office. Relevant copies of a particular MSDS are made available to employees or their authorized representative upon request. Information pertaining to operations in which hazardous chemicals are present will also be provided to employees.

F. EMPLOYEE TRAINING

The Safety Coordinator is responsible for ensuring the effective dissemination of **CCG** employee training and information programs.

Employees will be trained to work safely with hazardous chemicals. Employee training shall include:

1. An overview of the Requirements contained in the Hazard Communication Standard.
2. The locations of the MSDS file and written Hazard Communication Program.
3. The content and importance of material Safety data sheets and labels.
4. The methods and observations that may be used to detect the presence or release of a hazardous chemical.
5. Physical and health hazards associated with chemicals.
6. Methods used to protect employees.
7. Safe work procedures, emergency responses and use of personal protective equipment.

Every **CCG** employee is required to actively participate in the hazard communication training programs.

G. HAZARDOUS NON-ROUTINE TASKS

Periodically, employees may be required to perform hazardous non-routine work. It is **CCG** policy that such operations are not undertaken until the employees have been provided information on the possible undesirable effects that may arise during such operations. Prior to starting the work, each affected employee will be given this information by the Safety Coordinator. This information will include the chemical and physical hazards associated with the chemical, required personal protective equipment use, and the steps that the company is using to reduce the hazards. When necessary, areas will be posted to indicate the nature of the hazard involved.

In the event of an overexposure to or spill of any hazardous chemical, the Safety Coordinator will be notified at once. The foreman or the immediate supervisors will be responsible for insuring that proper and appropriate emergency response actions are taken. The appropriate material Safety data sheet pertaining to that chemical or substance will serve as reference for such actions.

H. MULTI-EMPLOYER JOBSITES

It is the policy of **CCG** to adequately apprise other contractors regarding the hazardous substance that their employees may be exposed to during the course of day-to-day construction activities. Contractors, whose employees may be exposed to hazardous substances used by **CCG** employees, will be given access to this Hazard Communication Program. This will provide all relevant chemical information necessary to protect their employees.

Contractors should be informed of conditions existing on-site that necessitate special precautionary measures through weekly Safety or toolbox meetings.

Other on-site employers working among **CCG** employees are also required to adhere to the provisions of the Hazard Communication Standard. They shall make available copies of MSDS's for all hazardous materials used by their employees that can be reviewed by **CCG** employees. MSDS's will be provided within a reasonable time period after such a request.

CCG is firmly committed to its employees' health and Safety, and as such requires that all contractors whose employees work around and among our employees to also be knowledgeable on chemical Safety and appropriate working procedures in an effort to reduce and eliminate chemical exposures to themselves, as well as the other craftsmen.

I. CCG CHEMICAL INVENTORY LIST

(Attach MSDSs to this list)

Product Name	Chemical Name	Manufacturer/ Distributor	Quantity	USE/Location

HEARING CONSERVATION PROGRAM

A. INTRODUCTION

In an effort to promote and maintain jobsites that are free from controllable Safety and health hazards CCG has implemented this hearing conservation program to protect its employees. The Safety Coordinator of CCG shall be responsible for implementing and maintaining the Hearing Conservation Program (HCP).

The Safety Coordinator is responsible for developing and implementing HCP plans and policies for an effective program. He/She has ultimate responsibility for the program and continuously focuses the attention of both management and employees on the hearing conservation program's policies and ensures that the necessary steps are taken to implement them. Examples of these policy statements include, but are not limited to the following:

- All noise-exposed employees must participate in the audiometric program, and
- Employees and visitors are required to wear the appropriate hearing protection while in posted areas.

B. NOISE-EXPOSURE MONITORING POLICY

Noise exposure monitoring will be conducted to:

- determine exposure levels in a manner that will accurately identify employees exposed to noise at or above 90 decibels (dB) averaged over an 8-hour time-weighted average (TWA),
- determine whether hazards to hearing exist,
- identify employees for inclusion in the hearing conservation program,
- classify employees' noise exposures for prioritizing noise control efforts and defining and
- establishing hearing protection practices,
- evaluate specific noise sources for noise control purposes, and
- evaluate noise control efforts.

All noise within an 80 dB to 130 dB ranges must be included in the exposure measurement during a typical work situation. Various types of instrumentation and measurement methods may be used, depending on the type of measurements being conducted.

The following instruments and measurement methods should be used to assess employee exposure levels:

- Sound level meter - Used to instantaneously identify work areas or equipment where employees' exposures are above or below hazardous levels, and where more thorough exposure monitoring may be necessary.
- Dosimeter - Used for personal surveys to monitor an employee's noise exposure over the entire work-shift. Dosimeters are especially useful when there is a high amount of worker movement around work areas and when there is potential for wide variations in noise exposures.

Instruments used for monitoring employee exposures must be carefully checked or calibrated to ensure that the measurements are accurate. Calibration procedures may vary according to specific instruments.

Monitoring should be repeated whenever a change in process, equipment or controls that may increase sound levels has occurred in order to establish whether current controls are sufficiently protective.

C. AUDIOMETRIC EVALUATION POLICY

Audiometric testing is crucial to the success of the hearing conservation program, since it is the only way to determine whether noise-induced hearing loss is being prevented. Audiometric testing will be made available to all employees who have average exposure levels over 90 dB during an 8- hour period. OSHA regulations require two types of audiograms as part of a hearing conservation program: baseline and annual audiograms.

- Baseline - Each employee exposed at or above 90 dBA for an 8-hour time weighted average shall participate in a valid baseline audiogram, within 6 months of exposure, to compare subsequent audiograms against.
- Annual - After obtaining a baseline audiogram, **CCG** shall obtain a new audiogram for all employees (exposed to 90 dBA or more) at least annually.

Employees not noise-exposed may also be given periodic audiograms as part of the company's health care program. Audiograms from non-noise-exposed employees may be compared to those of the noise-exposed employees to evaluate the overall effectiveness of the hearing conservation program.

To obtain the benefits of quality audiometric testing, the following practices will be adhered to as part of the CCG audiometric evaluation policy:

- All testing will be done under the supervision of an audiologist or a physician with expertise in the area of hearing assessment and protection.
- Audiometric tests will be given by a licensed or certified audiologist, otolaryngologist or technician certified by the Council for Accreditation in Occupational Hearing Conservation or a similar accrediting organization.
- The same type of audiometer (preferably the same instrument) should be used to prevent measurement variations caused by differences among machine models/types or by the type of responses required from the person being tested.
- Review of audiograms will be performed by a qualified professional (audiologist, otolaryngologist, or physician) with specific training and experience in the area of occupational hearing conservation.

Employees will be notified within 21 days, from the time the determination was made, if their audiometric test results indicated a standard threshold shift (STS). A standard threshold shift is an average shift (hearing change) in either ear of 10 dB or more at 2000, 3000, and 4000 Hz.

Employees already using hearing protectors shall be refitted and retraining in the use of hearing protectors and provided with new ones offering greater attenuation, if necessary.

If subsequent audiometric tests do not indicate the STS identified on a previous audiogram is persistent, employees exposed to noise less than 90 dB may discontinue the wearing of hearing protectors, if they so choose.

D. HEARING PROTECTION POLICY

OSHA requires that engineering and administrative control methods be used to reduce noise exposures. Hearing protection should only be used as an interim measure or when engineering and administrative controls fail to reduce noise to acceptable levels.

When considering the purchase of new equipment, noise levels of equipment should be an important criterion for purchase selection.

A hearing protection device (or "hearing protector") is anything that can be worn to reduce the level of sound entering the ear. Earmuffs and earplugs are the principal types of devices used to protect hearing. The following hearing protection practices will be implemented and enforced.

- All employees exposed to 8-hour time-weighted average noise levels of 90 dBA or above will be provided with (at no cost to the employee) and required to wear hearing protectors.
- A variety of hearing protection devices that provide adequate protection will be made available to employees. Appropriate devices will be selected for each employee, based on proper fit, the employee's noise exposure, hearing ability, communication needs, and other constraints imposed by job tasks or the work environment. Employees shall be permitted to select the device they feel most comfortable using. Supervision and training on the correct use of hearing protection will be provided.

E. TRAINING AND EDUCATION POLICY

Employees exposed to time-weighted averages of 90 dB and above will receive training at least annually on:

- The effects of noise;
- The purpose of hearing protection the advantages, disadvantages, and attenuation of various types of hearing protectors;
- The selection, fitting and care of protectors; and
- The purpose and procedures of audiometric testing.

F. RECORDKEEPING POLICY

Audiometric comparisons, reports of hearing protector use, and the analysis of noise exposure measurements all involve the maintenance of records. Hearing conservation records are medical records and, as such, will receive the same level of integrity and confidentiality as required by 29 CFR 1926.20 - Access to Employee Exposure and Medical Records. These records will be accessible at no charge for the initial request to the affected employees or their designated representatives, and government inspectors.

Upon employment with **CCG**, employees will be informed of:

- The existence, location, and availability of any records covered by this section:
- The person responsible for maintaining and providing access to records; and
- Each employee's rights of access to these records.

The following record keeping practices will be implemented to comply with OSHA requirements:

- Accurate records of employee noise exposure measurements must be maintained for 2 years.
- Records of audiometric test results must be maintained for the duration of employment of the affected employee and contain the following information:
 - Employee name and classification
 - Date of audiogram
 - Examiner's name
 - Date of last acoustic or exhaustive calibration
 - Employee's most recent noise exposure assessment
 - Background noise levels in audio test rooms
 - The tester's comments, if any.
- Audiometric testing records for each employee will be transferred to the successor employer.

G. PROGRAM EVALUATION POLICY

The primary goal of **CCG** hearing conservation program is the reduction and eventual elimination of hearing loss due to workplace noise exposure. Therefore, in an effort to assure that this goal is achieved, **CCG** will conduct evaluations of the effectiveness of all of the program's components to determine the extent to which the HCP is really working. Two basic approaches will be used to evaluate the HCP, they include:

- Assessing the completeness and quality of the program's components, and
- Evaluating the audiometric data.

The first approach will be implemented using the checklists found in this appendix. The checklist is useful for identifying deficiencies that could limit the program's effectiveness.

The second approach will be implemented for both individuals groups of noise-exposed employees. Each individual's current test will be compared to the baseline test to determine whether an OSHA standard threshold shift has occurred. Previous audiograms

for that individual will also be inspected and compared to each other and to the current test results to identify hearing loss progressions that may not have reached the severity of the OSHA standard threshold shift.

HEARING CONSERVATION PROGRAM EVALUATION CHECKLIST*

A. TRAINING AND EDUCATION

Failures or deficiencies in hearing conservation programs (HCPs) can often be traced to inadequacies in the training and education of noise exposed employees and those who conduct elements of the program.

1. Has training been conducted at least once a year?
2. Did a qualified instructor provide the training?
3. Was the success of each training program evaluated?
4. Is the content revised periodically?
5. Are managers and supervisors directly involved?
6. Are posters, regulations, handouts, and employee newsletters used as supplements?
7. Are personal counseling sessions conducted for employees having problems with hearing protection devices or showing hearing threshold shifts?

B. SUPERVISOR INVOLVEMENT

Data indicate that employees who refuse to wear hearing protectors or who fail to show up for hearing tests frequently work for supervisors who are not totally committed to the HCP.

1. Have supervisors been provided with the knowledge required to supervise the use and care of hearing protectors by subordinates?
2. Do supervisors wear hearing protectors in appropriate areas?
3. Have supervisors been counseled when employees resist wearing protectors or fail to show up for hearing tests?
4. Are disciplinary actions enforced when employees repeatedly refuse to wear hearing protectors?

C. NOISE MEASUREMENT

For noise measurements to be useful, they need to be related to noise exposure risks or the prioritization of noise control efforts, rather than merely filed away. In addition, the results need to be communicated to the appropriate personnel, especially when follow-up actions are required.

1. Were the essential/critical noise studies performed?
2. Was the purpose of each noise study clearly stated? Have noise-exposed employees been notified of their exposures and apprised of auditory risks?
3. Are the results routinely transmitted to supervisors and other key individuals?
4. Are results entered into health/medical records of noise-exposed employees?
5. If noise maps exist, does the proper staff use them?
6. Are noise measurement results considered when contemplating procurement of new equipment? Modifying work procedures? Relocating employees?
7. Have there been changes in areas, equipment, or processes that have altered noise exposure? Have follow-up noise measurements been conducted?
8. Are appropriate steps taken to include (or exclude) employees in the HCP whose exposures have changed significantly?

D. ENGINEERING AND ADMINISTRATIVE CONTROLS

Controlling noise by engineering and administrative methods is often the most effective means of reducing or eliminating the hazard. In some cases engineering controls will remove Requirements for other components of the program, such as audiometric testing and the use of hearing protectors.

1. Have noise control needs been prioritized?
2. Has the cost-effectiveness of various options been addressed?
3. Are employees and supervisors apprised of plans for noise control measures? Consulted on various approaches?
4. Will in-house resources or outside consultants perform the work?
5. Have employees and supervisors been counseled on the operation and maintenance of noise control devices?

6. Are noise control projects monitored to ensure timely completion?
7. Has the full potential for administrative controls been evaluated? Are noisy processes conducted during shifts with fewer employees? Do employees have sound-treated lunch or break areas?

E. MONITORING AUDIOMETRY AND RECORDKEEPING

The skills of audiometric technicians, the status of the audiometer, and the quality of audiometric test records are crucial to HCP success. Useful information may be ascertained from the audiometric records as well as from those who actually administer the tests.

1. Has the audiometric technician been adequately trained, certified, and re-certified as necessary?
2. Do on-the-job observations of the technicians indicate that they perform a thorough and valid audiometric test, instruct and consult the employee effectively, and keep appropriate records?
3. Are records complete?
4. Are follow-up actions documented?
5. Are hearing threshold levels reasonably consistent from test to test? If not, are the reasons for inconsistencies investigated promptly?
6. Are the annual test results compared to baseline to identify the presence of an OSHA standard threshold shift?
7. Is the annual incidence of standard threshold shift greater than a few percent? If so, are problem areas pinpointed and remedial steps taken?
8. Are audiometric trends (deteriorations) being identified, both in individuals and in groups of employees?
9. Do records show that appropriate audiometer calibration procedures have been followed?
10. Is there documentation showing that the background sound levels in the audiometer room were low enough to permit valid testing?
11. Are the results of audiometric tests being communicated to supervisors and managers as well as to employees?

12. Has corrective action been taken if the rate of no-shows for audiometric test appointments is more than about 5%?
13. Are employees incurring STS notified in writing within at least 21 days?

F. REFERRALS

Referrals to outside sources for consultation or treatment are sometimes in order, but they can be an expensive element of the HCP, and should not be undertaken unnecessarily.

1. Are referral procedures clearly specified?
2. Have letters of agreement between the company and consulting physicians or audiologists been executed?
3. Have mechanisms been established to ensure that employees needing evaluation or treatment actually receive the service (i.e., transportation, scheduling, reminders)?
4. Are records properly transmitted to the physician or audiologist, and back to the company?
5. If medical treatment is recommended, does the employee understand the condition requiring treatment, the recommendation, and methods of obtaining such treatment?
6. Are employees being referred unnecessarily?

G. HEARING PROTECTION DEVICES

When noise control measures are infeasible, or until such time as they are installed, hearing protection devices are the only way to prevent hazardous levels of noise from damaging the sensitive inner ear. Making sure that these devices are worn effectively requires continuing attention on the part of supervisors and the Safety coordinator as well as noise-exposed employees.

1. Have hearing protectors been made available to all employees whose daily average noise exposures are 90 dBA or above?
2. Are employees given a variety of protectors from which to choose?
3. Are employees fitted carefully with special attention to comfort?
4. Are employees thoroughly trained, not only initially but at least once a year?

5. Are the protectors checked regularly for wear or defects, and replaced immediately if necessary?
6. If employees use disposable hearing protectors, are replacements readily available?
7. Do employees understand the appropriate hygiene requirements?
8. Have any employees developed ear infections or irritations associated with the use of hearing protectors? Are there any employees who are unable to wear these devices because of medical conditions? Have these conditions been treated promptly?
9. Have alternative types of hearing protectors been considered when problems with current devices are experienced?
10. Do employees who incur noise-induced hearing loss receive intensive counseling?
11. Are those who fit and supervise the wearing of hearing protectors competent to deal with the many problems that can occur?
12. Do workers complain that protectors interfere with their ability to do their jobs? Do they interfere with spoken instructions or warning signals? Are these complaints followed promptly with counseling, noise control, or other measures?
13. Are employees encouraged to take their hearing protectors home if they engage in noisy non-occupational activities?
14. Are new types of protectors considered, as they become available?
15. Is the effectiveness of the hearing protector program evaluated regularly?

H. ADMINISTRATIVE

Keeping organized and current on administrative matters will help the program run smoothly.

1. Have there been any changes in federal or state regulations? Have HCP policies been modified to reflect these changes?
2. Are copies of company policies and guidelines regarding the HCP available in the offices that support the various program elements? Are those who implement the program elements aware of these policies?
3. Are necessary materials and supplies being ordered with a minimum of delay?

4. Are procurement personnel overriding the HCP manager's requests for specific hearing protectors or other hearing conservation equipment? If so, have corrective steps been taken?
5. Is the performance of key personnel evaluated periodically? If such performance is found to be less than acceptable, are steps taken to correct the situation?
6. Safety: Has the failure to hear warning shouts or alarms been tied to any accidents or injuries? If so, have remedial steps been taken?

*Much of this material has been adapted from D.C. Gassaway, "Evaluating and Fine-Tuning the Elements That Comprise a Program," Chapter 15 in *Hearing Conservation: A Practical Manual and Guide*. Prentice-Hall Inc.: Englewood Cliffs, NJ, 1985.

CCG SILICA PROTECTION PROGRAM OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA): SEP

A. SEP: SPECIAL EMPHASIS PROGRAM

In May 1996, OSHA began a Special Emphasis Program (SEP) for preventing silicosis, directing OSHA area offices, and states with their own plans, to begin conducting targeted inspections in industries where silica exposures are found.

The program did not involve the creation of a new standard, but rather targeted the application of existing standards.

OSHA inspections will be focused on those establishments where over-exposures to crystalline silica are most likely, or where there are known cases of silicosis.

Activities often associated with overexposure include: jack hammering, rock drilling, abrasive blasting, concrete mixing, concrete drilling, abrasive blasting, slab cutting, and guniting.

B. OSHA INSPECTION PROCESS UNDER THE SEP

The OSHA inspection process for a worksite with potential silica exposure may include:

- A review of written documentation (record-keeping, air monitoring results, medical exams, respirator protection program, engineering or work practice controls, compliance with hazard communication standard, and training).
- Questioning employers to determine whether personal or area sampling for crystalline silica has been conducted, and determining if the employer has conducted any medical surveillance of exposed employees.

- Employee interviews.
- Air sampling for silica, along with possible sampling for other health hazards. If deficiencies are found, the employer may be issued a citation.

The following list of standards includes those that may, under appropriate inspection conditions; result in a citation for crystalline silica overexposure under the Special Emphasis Program.

OSHA Requirement	General Industry Standard	Construction Standard	Maritime Standard
Respiratory Protection	1910.134	1910.134	1910.134
Permissible exposure limit and controls	1910.1000	1926.55 & .57	1915.1000
Accident prevention and warning signs	1910.145	1626.200	---
Access to employee exposure and medical records	1910.1020	1926.33	1915.1120
OSHA 200 forms	1904	1904, 1926.22	1904
Abrasive blasting, breathing air, enclosures, controls	1910.94	1926.28, .55, .95, .100, .103, .300	1915.131, .133, .151-.155, .1000
Hygiene	1910.141	1926.27 & .51	1915.97
General PPE	1910.132	1926.28, .95, .100-.105	1915.151-.154
Hazard Communication	1910.1200	1926.59	1915.1200
Safety and Health Program	---	1926.20	---
General Training	---	1926.21	---

C. ELEMENTS OF A SILICA CONTROL PROGRAM

- OSHA lists the following as important elements of an effective silica program that meets the needs of the SEP.
- In construction- A Safety and Health Program (required by specific OSHA standard).
- Ongoing personal air monitoring program.
- Ongoing medical surveillance program.
- Training and information to workers concerning silica (required by specific OSHA standard).
- Availability of air and medical surveillance data to workers (required by specific OSHA standard).

- Respiratory Protection Program (required by OSHA respirator standard effective April 8th, 1998).
- Hygiene facilities and clothing change area.
- Appropriate record-keeping (required by specific OSHA standard)
- Housekeeping program (required by specific OSHA standard)
- Regulated areas.

D. PRE-PLANNING

This program is based on the idea of exposure avoidance. With **CCG** making an effort to reduce or avoid silica exposure, we can:

- Reduce actual worker exposure to silica, thus minimizing the likelihood of the worker developing silicosis or any other related disease;
- Simplify, reduce or eliminate the need for medical evaluations, personal protective equipment (respirators), additional worker training and:
- Avoid OSHA citations.

Each contractor on any project is responsible for the health and Safety of its own workers, regardless of whether the company created the hazard. A project's general contractor is responsible for overall health and Safety on the project. Therefore, control of silica dust must be a coordinated, joint effort.

The owner or contracting entity must also be aware of **CCG** silica control program and agree to assist in their successful implementation.

- Prior to the start of the job, all contractors should identify potential silica exposures, along with other health and Safety issues expected during the project (e.g., rock drilling, concrete grinding or sawing).
- Prior to the start of the job, **CCG** should develop an action plan to avoid exposure of our own workers and those of other contractors. The plan should include:
 - Specific tasks that could release significant amounts of silica;
 - Anticipated location, starting and ending dates for each task;
 - Specific controls that will be used to reduce or eliminate silica release, (e.g. wet sawing or drilling, misting of dust, use of local exhausted power tools).

These plans will be distributed to all contractors involved on the project (preferably at the pre- construction conference). Each contractor should then review the silica action plans with regard to how they may affect operations, and incorporate them into work schedules.

All contractors should meet to discuss the proposed controls.

METHODS OF COMPLIANCE

If silica levels exceed the permissible exposure limits (PEL), OSHA requires that engineering and work practice controls be applied first to reduce contamination to below the PEL. If exposures cannot be brought down to below the PEL, respiratory protection can then be used to reduce exposure. In the event that respirators are required, **CCG** will develop and implement a respiratory protection program.

A. ENGINEERING CONTROLS

The use of properly designed engineering controls is the best approach for controlling dust from crystalline silica-containing materials. **CCG** will review the job to determine which, if any, engineering controls are feasible. Below are some examples of engineering controls:

- Wet sawing or drilling. If wet suppression systems are used, spray nozzles and associated piping should be maintained to assure that adequate wetting agent is applied.
- Enclosed workstations, such as control booths and equipment cabs, should be under positive pressure and provided with clean make-up air.
- Engineering design of equipment should include, where feasible, provisions to reduce exposure of workers to respirable crystalline silica dust to below the PEL. This may include HEP A filtered local exhaust power tools.

Whenever possible non-silica containing abrasives should be used if abrasive blasting is being done. The use of non-silica containing materials can also create a dust hazard. Most substitute materials have a PEL of 5 mg/m³ for respirable dusts or 15 mg/m³ for total dusts.

B. ADMINISTRATIVE CONTROLS

Administrative controls can be used in conjunction with engineering controls to further reduce the likelihood of worker exposure.

- When **CCG** anticipates doing work that will create silica dust all other on-site contractors will be notified in advance as far as possible as to: location, date, start time, duration.
- Where required **CCG** will limit silica generating work to off-hours, or coordinate times when other contractors can vacate the immediate work area.
- Contractors should, to the extent feasible, leave the immediate work area while **CCG** conducts silica-generating operations.
- **CCG** will notify our workers of the potential for silica exposure by:
 - Posting silica-warning signs where other worker notices are posted.
 - Having the area flagged off, if necessary and feasible, to prevent unauthorized workers from entering during silica generating operations.

C. PERSONAL PROTECTIVE EQUIPMENT (PPE)

If it is determined that engineering controls and administrative controls may not adequately protect the workers, personal protective equipment must be used. The need for all of the following PPE should be evaluated for each project, as all this equipment may not be needed on every project.

Basic PPE

- Eye protection
- Face protection (face shield)
- Hearing protection (ear plugs or muffs)
- Coveralls (either disposable or reusable)
- Foot protection (sturdy work shoe required, Safety shoes recommended)
- Head protection (hard hat, blast helmet)
- Respiratory protection - *In many cases with engineering and administrative controls in- place, respirator use can be avoided entirely, or at least limited.*

D. RESPIRATORY PROTECTION

Before respirators are chosen as a hazard control measure, several steps must be taken. The first step in controlling any potentially hazardous airborne exposure is to measure the concentration of the contaminant through air sampling.

Air sampling provides information about whether the silica is being generated at a hazardous level, how much of it is quartz, and how much of it is small enough to be respirable. Sampling results are compared to published exposure limits, such as OSHA's

permissible exposure limits (PEL), to determine if the contaminant levels in the workplace may be hazardous.

OSHA does not require an employer to institute engineering controls or provide respirators when employees are exposed to air contaminant levels below the PEL. In the case of engineering controls, it would be highly recommended that level of air contamination be reduced to as low a level as possible.

E. REQUIRED RESPIRATOR USE

Once it has been determined that respirators are necessary or required, care must be taken to properly select, use and maintain the respiratory protection equipment. Both the nature of the air contaminant and its exposure concentration must be considered in properly selecting a respirator.

Each employee must be provided training in the proper use and care of the respirators they are provided and must be medically fit to wear the respirator.

The employer must designate a respiratory protection program administrator who is responsible for overseeing the employer's respirator program and conduct the required evaluations of the program's effectiveness. The Requirements for an effective respiratory protection program are found in OSHA's 1910.134 regulation. Appendix B contains a respiratory protection program and the OSHA standard.

According to 1910.134, whenever respirators are necessary to protect the health of employees, or whenever an employer requires the use of respirators, the employer must have a written respiratory protection program that covers certain required worksite-specific procedures for respirator use. The written program must be worksite specific.

The basic elements that must be covered in a written respiratory protection program are:

- Procedures for selecting respirators in the workplace;
- Medical evaluations of employees required to use respirators;
- Fit testing procedures for tight-fitting respirators;
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use and their maintenance; and

- Procedures for regularly evaluating the effectiveness of the program.

Using a respirator causes stress to the cardiovascular system, which may be hazardous to some workers. Therefore, the standard requires that even before an employee is fit tested for a respirator, the employer shall provide a medical evaluation to determine the employee's ability to use a respirator.

A physician or other licensed health care professional must do the medical evaluation by using the mandatory medical questionnaire (found in Appendix C of 1910.134) or an initial medical examination that obtains the same information as the medical questionnaire. Prior to giving the medical questionnaire, the health care provider must be given the following information:

- The type and weight of the respirator to be used by the employee;
- The frequency and duration of respirator use;
- The expected physical work effort;
- Additional protective clothing and equipment worn;
- Temperature and humidity extremes that may be encountered; and
- Ensure they have a copy of the 1910.134 standard.

NOTE: Upon completion of the initial evaluation, and follow-up exam if necessary, the health care provider must provide a written report to the employer regarding the employee's ability to wear a respirator, any limitations on respirator use, the need for any further medical evaluations, and a statement that the health care provider has given the employee a copy of the same written medical determination report that is provided to the employer.

F. VOLUNTARY USE RESPIRATORS

This section applies if CCG requires respirators to be worn even though exposure monitoring has shown that silica exposure is below OSHA's PEL. This section of OSHA's standard also applies in the event that an employee requests a respirator even though exposure monitoring has shown that the employee is exposed to silica less than the permissible exposure limit.

The following are Requirements of the voluntary use section of OSHA's respiratory protection standard 1910.134.

- **CCG** will make sure that the employee's voluntary use will not create a hazard.
- Information provided in Appendix D of 1910.134 must be provided to all employees.
- An abbreviated respiratory protection program must be implemented which includes provisions for initial medical screening, means and training so that the worker can clean, store, and maintain the respirator.

Unless the respirator is a filtering face-piece respirator (paper dust mask, etc.) a short program will be put together describing how **CCG** will meet the previous three requirements.

EXPOSURE MONITORING

Exposure monitoring, or personal air sampling, needs to be conducted for certain activities that generate large amounts of silica dust. This will allow **CCG** to determine the silica exposure to workers and determine whether or not additional precautions need to be taken. Examples of such activities are jack hammering and drilling or cutting into rock or concrete. Very high exposures occur when abrasive blasting using silica sand.

Air monitoring at job sites with potentially significant silica exposure can ensure the effectiveness of the engineering and administrative controls, and also ensure that the appropriate level of respiratory protection is chosen.

Furthermore, air sampling will allow **CCG** to:

- Generate historical data to help anticipate future respirator and PPE needs
- Characterize the exposure and its variability
- Determine compliance with applicable standards

A. EXPOSURE LIMITS

Permissible Exposure Limits - OSHA 29 CFR 1910.1000 states that workers shall not be exposed to respirable dust containing quartz exceeding: 10 mg/m^3 divided by $(\% \text{ quartz} + 2)$ as an 8-hour time weighted average in any 8-hour work shift of a 40 hour work week. *By law the PEL cannot be exceeded.*

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienist (ACGIH) have recommended an exposure limit of $50 \mu\text{m}^3$ for crystalline silica. Although these lower limits are not enforceable they are recommended.

B. SILICA EXPOSURE MONITORING ACTION PLAN

Employees with the highest dust exposure shall be sampled first. Sampling should then progress toward those workers with lower exposures. Sampling information is summarized in the table on the following page:

RESPIRABLE SILICA SAMPLING PLAN

Condition	Action
Initial sampling	Sample each representative task starting with assumed highest dust exposure levels. Results are used to establish plan
Sampling results are below ½ the PEL	No periodic sampling necessary but additional samples may be required due to process changes.
No PEL overexposures were found, but these noted locations are to be included in exposures exceed ½ the PEL	These noted locations are to be included in a sampling plan. Noted job functions should be sampled at least annually with a goal of sampling each employee with that job function. These employees should be included in a respirator program
PEL was exceeded and engineering, work practice, and administrative controls are the exposure to below the PEL exposure	Sampling to be conducted before and after remedy to assess the results of silica being applied to the work area to reduce reduction efforts. If high levels persist, institute workplace controls and include in control plan sampling plan until levels are below ½ the PEL.
Process materials, equipment, engineering controls, or any other changes that occur which would tend to increase worker exposures.	Sampling to be conducted as soon as feasible to assess the effects of workplace changes on employee exposures.
Ventilation enclosures are used because work area exposures are presumed or known to exceed the PEL.	Sample at least annually to assure that worker exposures do not exceed ½ the PEL.
Short duration [hours or less] silica dust generation operations such as drilling and cutting.	Depend on workplace controls to reduce exposures.
Employee(s) or supervisors express concerns that silica exposures have increased or are present.	Sample as soon as feasible.

C. EMPLOYEE TRAINING REQUIREMENTS

All workers must be trained to at least OSHA's Hazard Communication Standards (1926.21) level of awareness of silica, which consist of:

- Adverse health effects of silica
- Jobs that generate silica
- Procedures and equipment used to minimize silica dust exposures
- Availability of medical records and air monitoring results.
- If respirators are required, full compliance with OSHA respirator standard.

D. SUGGESTED TRAINING

To ensure that everybody understands fully the hazards of silica and the procedures of working with silica-containing materials, the training should be more comprehensive than what is required by the hazard communication standard, and given to all personnel, not just those who might be exposed to silica dust.

The following is an outline of the training that should be provided:

- The specific nature of operations that could result in exposures to respirable crystalline silica dusts above the PEL.
- An explanation of engineering, work practice, hygiene, administrative, and personal protective equipment controls used in each of the above operations to eliminate or reduce silica exposures.
- The purpose and description of the medical surveillance program, and the medical protection program, including information concerning:
 - The purpose of silicosis diagnostic exam elements such as work histories, chest x-rays, lung function tests, and tuberculosis screening.
 - The adverse health effects associated with excessive exposures to respirable silica dusts, including silicosis, tuberculosis, and the association with lung cancer.
 - The purpose, proper selection, fitting, use and limitations of respirators if they are used to supplement engineering, administrative and work practice controls to reduce silica exposures.

What is required under law (Hazard Communication Standard) and what is suggested above is not that different. The benefits of good training are significant for both the contractor's liability and the workers' health.

E. FREQUENCY OF TRAINING

The training should be provided once a year, prior to the initial job assignment, and whenever an employee is assigned to a new or unfamiliar task or operation involving silica exposure.

F. CERTIFICATION OF TRAINING

CCG will verify that training has been completed by preparing a written certification record. The written certification record should contain:

- The name or other identity of the employee trained,
- The date(s) of the training, and
- The signature of the trainer and trainee(s)

SUPPLEMENTAL EMPLOYEE TRAINING MATERIAL

A. WHAT IS SILICOSIS?

Every year, 2 million workers in the U.S. are exposed to crystalline silica, which can cause silicosis, a disabling and sometimes fatal disease. About 300 deaths are attributed to silicosis annually although many go unrecognized.

Crystalline silica, also known as quartz, is a natural compound in the earth's crust and is a basic component of sand and granite.

Silicosis is a disease of the lungs caused by breathing dust containing crystalline silica particles. When workers inhale crystalline silica, the lung tissue reacts by developing fibrotic nodules and scarring around the trapped silica particles.

This condition, known as silicosis, makes breathing difficult, can be totally disabling and may lead to death. There is no cure for this disease.

B. SYMPTOMS OF SILICOSIS:

- Initially there may be no symptoms of silicosis.

- Continued exposure may result in a shortness of breath on exercising, possible fever and
- occasionally bluish skin at the ear lobes or lips.
- Progression of silicosis leads to fatigue, extreme shortness of breath, loss of appetite, pain in the chest, and respiratory failure, which may cause death.
- Silicosis makes a person more susceptible to infectious diseases of the lungs such as tuberculosis.

See a physician if you experience these symptoms and suspect that you have been exposed to crystalline silica.

There are three types of silicosis, depending on the concentration of crystalline silica to which a worker is exposed:

- **Chronic silicosis**, occurs after 10 or more years of exposure at relatively low concentrations.
- **Accelerated silicosis**, results from exposure to high concentrations and develops 5 to 10 years after the initial exposure.
- **Acute silicosis**, occurs where exposure concentrations are the highest and can cause symptoms to develop within a few weeks to 4 or 5 years after the initial exposure.

C. HOW DO CONSTRUCTION WORKERS GET EXPOSED?

Most crystalline silica comes in the form of quartz. Sand can be as much as 100% quartz, a common ingredient in concrete and masonry products. Since concrete and masonry products are primary materials for construction, there are many ways workers are exposed at construction sites, such as the following:

- Chipping, hammering, and drilling of rock
- Crushing, loading, hauling, and dumping of rock
- Abrasive blasting using silica sand as the abrasive
- Abrasive blasting of concrete (regardless of abrasive used)
- Sawing, hammering, drilling, grinding, and chipping of concrete or masonry
- Demolition of concrete and masonry structures

- Dry sweeping or pressurized air blowing of concrete, rock, or sand dust

The two construction activities with the most severe worker exposures to crystalline silica, and the ones with the highest cases of silicosis, result from sandblasting, and tunneling / drillers. Other exposures to dust from silica sand may occur in cement manufacturing, asphalt pavement manufacturing, and the foundry industry.

D. HOW CAN WORKERS PREVENT EXPOSURE?

The key to preventing silicosis is to prevent silica dust from being released into the air. A simple control may work. Here are some steps you can take.

- Employers should use engineering controls such as water sprays, blasting cabinets, and ventilation of containment structures. (For example, a water hose to wet dust down at the point of generation.)
- Always use the dust control system and keep it in good maintenance.
- Use abrasives containing no silica whenever possible or less than 1 % crystalline silica during abrasive blasting to prevent harmful quartz dust from being released into the air.
- Be aware of the health effects of crystalline silica and that smoking adds to the damage.
- Know the work operations where exposure to crystalline may occur.
- If possible, change into disposable or washable work clothes at the worksite; shower (where available) and change into clean clothing before leaving the worksite.
- Do not eat, drink, use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica. Wash your hands first.

Respirators should not be the primary method of protection. If controls cannot keep dust levels below permissible exposure levels then respirators must be used. When respirators are used, OSHA requires employers to establish a comprehensive respiratory protection program. Respiratory protection programs are outlined in OSHA standard 1926.103.

E. MEDICAL MONITORING

Medical examinations should be available to all workers who may be exposed to respirable crystalline silica. However, examinations should always supplement effective dust monitoring and controls - never substitute for them. Such examinations should occur

before job placement or upon entering a trade, and at least every three years thereafter. Examinations should include at least the following:

- A medical and occupational history to collect data on crystalline silica exposure and signs and symptoms of respiratory disease.
- A chest X -ray.
- Pulmonary function testing (also known as spirometry test)
- An annual evaluation for tuberculosis.

F. PERSONAL HYGIENE

- All workers exposed to silica dust should wash face and hands prior to smoking, drinking, eating and at the end of the shift.
- Eating, drinking, smoking, use of chewing gum or tobacco is prohibited in all areas contaminated with silica dust, at or above the OSHA permissible limit.
- To the extent feasible, all vehicles and equipment should be parked away from any anticipated silica dust generating operation.
- Workers with exposures at or above the OSHA permissible limit should wear worker protective clothing (e.g., disposable or washable work clothing) that stays on site.

MEDICAL MONITORING AND SURVEILLANCE

OSHA requires employers with workers who are exposed to silica in excess of the PEL for 30 days per year or more to institute respiratory medical surveillance programs.

A. MEDICAL EXAMS

Medical examinations shall be made prior to placement of new employees, within six months of the adoption of this practice for workers already employed, and once every three years thereafter.

These examinations should include:

- Medical and occupational history to elicit information on respiratory symptoms, smoking history, and prior exposures to dust, etc., affecting the respiratory system.

- A posterior-anterior (PA) chest roentgenogram on a film no less than 14 by 17 inches and no more than 16 by 17 inches at full inspiration. The roentgenogram shall be classified according to the 1980 *Guidelines for the Use of ILO International Classification of Radiographs of Pneumoconiosis* by NIOSH certified "B" readers.
- A pulmonary function measurement including a determination of forced vital capacity (FVC) and forced expiratory volume in one second (FEV₁), the FEV₁/FVC ratio, and the percentage that the measured values of FEV₁ and FVC differ from the predicted values.
- A tuberculosis intradermal skin test using purified protein derivative for new hires at the time of the baseline examination and for workers with roentgenographic evidence of silicosis who have not been tested.

CCG shall provide the following information to the physician:

- A description of the affected employee's duties as they relate to the employee's exposure.
- The employee's representative exposure level or anticipated exposure level to respirable crystalline silica.
- A description of any personal protective and respiratory protective equipment to be used by the employee.
- Information from previous medical examinations of the affected employee that is not otherwise available to the physician.

B. MEDICAL MONITORING AND SURVEILLANCE

CCG will then ensure a written signed opinion from the physician is obtained. This written opinion should contain the results of the medical examination and include:

- The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to respirable crystalline silica.
- Any recommended limitations on the employee.
- A statement that the employee has been informed by the physician of the results of the medical findings and of any medical conditions resulting from respirable crystalline silica exposure that require further examination or treatment.
- A statement that they have not revealed any unrelated diagnosis.

C. RECORDKEEPING

All medical and exposure monitoring required by this practice will be maintained accurately and be kept up to date. These records should include:

- Name, identification number, and job title of each employee monitored for dust exposure. For each employee monitored: the exposure monitoring results, work location, and the monitoring date.
- A description of the sampling procedure used for each employee monitored to include sampling pump calibration data.
- A description of the analytical methods used.
- The type of respiratory protection worn by each employee monitored, if any, and fit testing records
- Each employee exposure record shall be kept for at least 30 years.

Additional record keeping requirements:

- Employee medical records shall be kept for the duration of employment plus an additional 30 years.
- Each worker or their representative shall have access to records of their occupational exposure and medical examination in accordance with regulatory provisions.

Periodic review and evaluation of sampling and medical records shall be performed to determine the effectiveness of control measures.

Employees will be informed as to the results of medical and sampling results within 30 days of receipt of this data. An acknowledgment record, signed by the employee, attesting to being informed, should be maintained along with medical records for 30 years past employment of each individual.

D. SILICA SELF-COMPLIANCE CHECKLIST

Has personal or area air monitoring been conducted in areas or for activities that may result in exposure to silica dusts?

Have records of exposure monitoring been retained?

Are engineering or administrative controls in place, where feasible, to control employee exposures to silica?

If respiratory protection is required:

- Is there a written, site-specific respiratory protection program?
- Is there a suitably trained program administrator?
- Have medical evaluations of employees been conducted, prior to issuing respirators?

Has the physician performing the medical examinations been provided?

- A description of the employee's duties related to exposure?
- The employee's silica exposure level?
- The type of personal protective equipment used by the employee?
- The information required by the respiratory protection standard?

Have affected employees been trained in:

- Adverse health effects of silica?
- Jobs that generate silica?
- Procedures to minimize silica dust exposure?
- The availability of medical and exposure records?

Have employee-training records been documented and retained?

Have employee medical records been preserved and maintained?

CCG RESPIRATORY PROTECTION PROGRAM

A. GENERAL

This is a mandatory program for each project where respiratory hazards are present. The program is designed to allow each project to identify their hazards and to provide the appropriate protection. Each project where respiratory protection is needed shall have a Respirator Program Administrator (RPA). This individual must be knowledgeable of respiratory protection equipment, including the manufacturer recommendations and instructions for the proper use, inspection and maintenance. The RPA must be capable of identifying existing and potential respiratory hazards and has the authority to take prompt corrective action to protect workers from those hazards.

The Respirator Program Administrator for this project is:

(PRINT)

The intent of this written program is to define the company rules now in effect regarding the use of respirators for personal protection against airborne contaminants. The Requirements contained herein are not optional for the employee. **CCG** considers this policy mandatory and a condition of employment for each individual.

To ensure the availability of this respirator program at all times, copies of this written program shall be distributed as follows:

1. _____
2. _____
3. _____

B. WORK AREA SURVEILLANCE

It is essential to follow the Hazard Communication Program of this company in order to identify all chemical hazards prior to the commencement of work. A review of all Material Safety Data Sheets for the project will be necessary to complete the following list of potential air contaminants where respiratory protection may be required. Air sampling may be conducted to define personal exposures associated with potentially hazardous operations and follow-up air sampling shall be conducted when conditions change. Documentation of all air sampling shall be maintained at the project using the following table.

For this project the following is a list of all known air contaminants (e.g., Silica, organic solvents, fiberglass), exposure levels, and project locations where these contaminants are likely to be found.

CCG WRITTEN RESPIRATOR PROGRAM

AIR CONTAMINANTS	KNOWN OR ANTICIPATED EXPOSURE LEVEL	LOCATION

C. AVAILABILITY OF RESPIRATORS

Each employee that requires a respirator will be provided one by the RP A with replacement parts, cartridges and filters available upon request. The following types of respirators are available:

TYPE OF RESPIRATOR & CARTRIDGE	CONTAMINANTS PROTECTED AGAINST

CCG WRITTEN RESPIRATOR PROGRAM

A. USE OF RESPIRATORS

Each employee whose job assignment requires a respirator shall wear a NIOSH approved respirator, properly fitted, at all times during the course of that job assignment. Additionally, any employee in the immediate area of a hazardous operation and is at risk of an exposure must also follow the Requirements of this program. No alterations of the respirators are permitted. The following operations at this project are considered potentially hazardous and require the use of a respirator:

OPERATIONS

B. SELECTION OF RESPIRATORS

Only NIOSH approved respirators have been chosen for use in this program. The choice between these respirators is dependent upon the airborne contaminant present, the operation performed, and on the basis of comfort and ease in obtaining a proper individual fit. Negative pressure respirators may only be used for slightly to moderately toxic dusts, fumes and mists, or vapors with good odor warning properties (10% less concentration of the allowable limit). Half face respirators may only be used for up to 10 times the permissible exposure limits (PEL); full-face respirators for up to 50 times the PELs. They are not allowed for use in unknown concentrations, emergency or rescue, immediately dangerous to life and health situations or oxygen deficient atmospheres.

CCG will provide these respirators, maintaining a supply at the project. The useful life of each respirator will depend mainly on the employee's job duties and the actual time the unit is in use. A respirator cartridge or canister change schedule will be provided to each user, and must be strictly followed. Notify the RP A if any contaminants are sensed through the respirator or breathing becomes difficult using the cartridge/canister change schedule.

C. FITTING OF RESPIRATORS

Proper fitting of respirators is essential if employees are to receive the designed protection. Air that passes around the edges of the respirator, rather than through it, is not filtered air. In order to ensure a good face seal, the following rules must be observed.

1. The respirator and straps must be in place and work in the appropriate position. To adjust headbands, pull the free ends tight until a comfortable fit is obtained. All straps shall be secure.
2. To adjust the face-piece properly, simply position your chin firmly in the chin cup and manually shift the rubber mask until the most comfortable position is located. Make final adjustments in the headband and do not break the nasal seal. Modifications to the respirator or straps shall not be made.
3. Proper fit must be checked each time the respirator is worn. Fit checking procedures found in Appendix B-1 of 1910.134 will be followed each time a respirator is put on. The Respirator Program Administrator will assure during the training period, that each employee can demonstrate the use of fit-checking procedures. Respirators shall not be worn when projections under the face-piece prevent a good face seal. Note: Such conditions may be a growth of beard, sideburns, temple pieces on glasses or a skullcap that projects under the face-piece.
4. Prior to issuing a respirator to an individual, the respirator must be tested using the appropriate Qualitative or Quantitative fit test procedures found in Appendix A of 1910.134. For example, qualitative fit tests determine if the wearer can detect the "banana oil" odor. Irritant smoke tests can also be used with respirators to insure proper fit. An advantage of the irritant smoke method is that subjective employee responses are eliminated since a poor fit results in an involuntary coughing response. Quantitative and semi-quantitative fit tests involve the use of a booth or other means for measuring the concentration of the test atmosphere inside the respirator versus the concentration that exists outside the respirator.
5. The fit test exercises for testing a respirator equipped with a face-piece include the following for at least two minutes each:
 - a. Normal breathing
 - b. Deep breathing
 - c. Turning head from side to side
 - d. Nodding head up and down
 - e. Talking
 - f. Normal breathing

In the event an employee is unable to obtain a satisfactory fit with the type of respirator furnished, the RP A will make efforts to correct the problem (i.e. provide a different size of respirator or a different brand of respirator).

6. Fit testing will be conducted prior to wearing a respirator, and will be repeated annually. Fit testing will also be conducted whenever a different respirator face-piece is used, or when there is a change in an employee's physical condition that could affect a fit (such as dental work or surgery, that affects the facial contours).

D. RESPIRATOR CLEANING, INSPECTION, STORAGE, AND MAINTENANCE

Respirator cleaning, inspection, storage and maintenance are part of the user's responsibility. Procedures for cleaning and disinfecting respirators found in 1910.134, Appendix B-2 will be followed.

Respirators must be cleaned after each day's use and placed in a plastic bag and properly stored.

At the end of each week (or more often, if needed) respirators should be completely cleaned and disinfected by carrying out the following procedures:

1. Remove the air purifying elements from the respirator. Air purifying elements must never be washed and disinfected.
2. Immerse the respirator in a warm (140-1600p) aqueous solution of a germicidal detergent. The respirator face-piece and parts may be scrubbed gently with a soft brush. Make sure that all foreign matter is removed from all surfaces of the rubber exhalation valve flap and plastic exhalation valve seats.
3. After washing and disinfecting the respirator, rinse the same with clean, warm (140-1600P) water and then allow the respirator to dry.
4. After the respirator is dry, attach the air purifying elements.
5. Store the respirator in the container provided for the purpose.

Any malfunction on the respirator shall be reported to Respirator Program Administrator. Necessary replacement parts will be made available.

After inspection, cleaning and necessary repair, or after each day's use, the respirator shall be stored in a bag and in the location provided for the purpose of protecting the respirator and keeping it clean and sanitary. In storing the respirator, the face-piece and exhalation valve must be in normal position, so as to prevent the abnormal set of elastomeric parts during storage.

Each worker assigned to use a respirator shall maintain and routinely inspect it before and after each use. Respirators will be inspected monthly by the Respirator Program Administrator to assure that they are kept clean and in satisfactory working condition.

E. MEDICAL SURVEILLANCE

A blank Respirator Medical Evaluation Questionnaire (identical to that found in Appendix C of 1910.134) will be provided to each employee required to use a respirator prior to fit testing. This questionnaire must be completed and sent, in the postage-paid envelope, to the designated examining licensed health care provider (LHCP). Information provided by the employee in this questionnaire will not be disclosed to this company or the Respirator Program Administrator. The Respirator Program Administrator will give the LHCP information regarding the type of respirator each employee will be using, how and when the respirator will be used, the employee's work duties, and other factors which may affect the employee's ability to use a respirator such as the use of additional personal protective equipment, and the presence of high heat and humidity working conditions. A copy of this written respiratory protection program and a copy of 1910.134 will also be provided to the LHCP.

The Licensed Health Care Provider for this Project is:

Based on information about the types and conditions of respirator use, and a review of the questionnaire, the examining physician may request that an employee visit for a follow-up medical examination to determine the ability to wear a respirator. A recommendation regarding a prospective respirator user's ability to wear a respirator will be provided to the company by the LHCP. A copy of this recommendation will be provided to the prospective user as well.

Employees who have been approved to wear a type or types of respirators by a LHCP, will be provided additional medical evaluations at a later date if any of the following conditions exist:

- The employee reports medical signs or symptoms that are related to the ability to use a respirator;
- An LHCP, supervisor, or the Respirator Program Administrator request a reevaluation;
- Any information such as observations during fit testing or inspections of the respirator program indicates the need for employee reevaluation; or
- A change in workplace conditions (such as physical work effort, protective clothing, increased temperature or humidity) occurs that may result in an increase in the physiological burden placed on an employee.

F. TRAINING AND INFORMATION

Before initially using a respirator, and at least annually, each employee will receive training regarding the need for, care and use of their respirator. Following the training, each employee will be asked to explain and/or demonstrate:

- Why they need to wear the respirator;
- How the proper functioning of the respirator can be effected by improper fit, usage, or maintenance;
- In what hazards and work conditions the respirator will and will not provide proper protection;
- How to recognize when the respirator malfunctions, and what to do about it;
- How to inspect, put on, take off, use and fit check the respirator;
- How to properly maintain and store the respirator;
- How to recognize personal health problems which may make wearing a respirator hazardous to your health;
- The contents of **CCG** respirator program and the general Requirements of OSHA's respirator standard;
- The purpose of **CCG** medical surveillance program for respirator use and how it works.

Upon successful demonstration that the employee understands the information above, a respirator-training card will be presented to each employee. This card will contain the employee's name, date of training, specific respirators the employee may use, and the date for the next training. Training may be repeated more often than annually as necessary.

Respirator Training Record

Employee Name	Date of Training	Allowable Respirators	Trainer

G. RESPIRATOR PROGRAM EVALUATION

CCG shall monitor the effectiveness of this program by:

1. Frequent unscheduled observation of employee activities throughout the project to confirm proper respirator use and continual supervisory enforcement to ensure that employees are wearing proper respirators and maintaining them properly.
2. Observation of, and discussion with, new and relocated employees to confirm proper training has been carried out.

3. Periodic discussion with supervisors and general personnel during appropriate scheduled meetings to reinforce previous training.

H. RECORDKEEPING

Records shall be kept at the job site to document that each respirator wearer has been subject to training, fit testing, medical surveillance. Written records of air sampling information, workplace surveillance information, respirator types available on site, respirator inspections and program evaluations will also be kept at the site. Following the conclusion of the job, all written records related to respiratory protection will be forwarded to the company administrative offices. The LHCP will maintain any confidential medical information, including the employee's initial Respirator Medical Evaluation Questionnaire. Any employee may review Safety and health records related to this or any prior job by contacting their supervisor or CCG records administrator.

RESPIRATORY PROTECTION PROGRAM IMPLEMENTATION GUIDE

A. INTRODUCTION

The Laborers' Health & Safety Fund of North America prepared this guideline to help you understand and comply with OSHA's new 1910.134 Respiratory Protection Standard that began in April 1998 and became fully effective in October 1998. While the new Respiratory Protection Standard retains many of the provisions of the older OSHA respirator standard, there are some significant changes that will affect the way respirators are used on your jobsite. Some of the major changes include:

- The need for a Respirator Program Administrator;
- New Requirements for the voluntary use of respirators;
- More detailed respirator fit test requirements;
- The need for site-specific written respirator programs;
- New Requirements for respirator filter and cartridge change frequencies;
- New procedures for determining medical fitness to use a respirator.

B. RESPIRATORY PROTECTION PROGRAM ELEMENTS

Exposure Assessment and Control: Before respirators are used, several steps must be taken. The first step in controlling any potentially hazardous airborne exposure is to measure the concentration of the contaminant through air sampling techniques. Air sampling provides information about whether the airborne level of exposure is hazardous to unprotected employees. Sampling results are compared to exposure limits such as OSHA's Permissible Exposure Limits (PELs) or the ACGIH's Threshold Limit Values (TLVs) to determine if the contaminant levels in the workplace may be hazardous to workers.

If contaminant levels exceed the PEL, OSHA requires that engineering and work practice controls be used first to reduce contaminant levels to below the PEL. Respirators should only be used after it has been shown that engineering and work practice controls are unable to reduce exposures to below the PEL or that these controls are infeasible.

Respirator Program Administration: Once it has been determined that respirators are necessary or required, care must be taken to properly select, use and maintain the respiratory protection equipment. Both the nature of the air contaminant and its exposure concentration must be considered in properly selecting a respirator. Employees must be provided training in the proper use and care of the respirators they are provided, and must be medically fit to wear the respirator. The employer must designate a Respirator Program Administrator (RP A) to oversee the employer's respirator program and conduct the required evaluations of the program's effectiveness. To effectively fulfill these duties, the respirator program administrator must have the training or experience that matches the complexity of the program.

Written Program: According to 1910.134, whenever respirators are necessary to protect the health of employees, or whenever an employer requires the use of respirators, the employer must have a written respiratory protection program that covers certain required worksite-specific procedures for respirator use. In most construction settings a generic type of program will suffice for work activities where the contaminants and expected exposure levels are similar from job to job. The written program must be updated however, when changes in workplace conditions occur that affect respirator use. The basic elements that must be covered in a written respiratory protection program are:

- Procedures for selecting respirators in the workplace;
- Medical evaluations of employees required to use respirators;
- Fit testing procedures for tight-fitting respirators;
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use and their maintenance;
- Procedures for regularly evaluating the effectiveness of the program.

All of the procedures spelled out in the written program must then be implemented.

Voluntary Respirator Use: If employees on a worksite voluntarily use respirators (such as disposable dust masks), but they are not required to use them, the employer still has a few obligations. First, the employer must determine that the employee's voluntary or non-mandatory respirator use will not create a hazard. Second, the information provided in

Appendix D of 1910.134 must be provided to all employees who use respirators not mandatorily worn. Third, an abbreviated respiratory protection program must be established and implemented with the voluntary use of respirators. This abbreviated program must include provisions for initial medical screening of the voluntary respirator user, and the means and training so that the user can properly clean, store, and maintain the respirator. Unless the voluntarily used respirator is a filtering face-piece respirator (e.g. paper dust mask), a short written program must be put together (or added to the existing written respirator program) that discusses how the determination was made that the voluntary use does not create a hazard, how Appendix D will be provided, and how the abbreviated respirator program (consisting of medical screening and training) will be carried out.

Respirator Selection: The proper selection of respirators cannot be accomplished without first knowing the respiratory hazard(s) present and the level of employee exposures to these hazards. Knowing the hazards and their airborne levels is most often accomplished through personal exposure air monitoring, or by looking at past exposure levels encountered on similar jobs. It is very important that some actual or educated estimate of exposure levels is known before selecting a respirator. In the absence of such information, OSHA requires that the job's exposure levels be considered Immediately Dangerous to Life and Health (IDLH)-a situation which requires the use of air-supplying type respirators such as SCBAs.

Once exposure levels have been determined, employers must "select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user." If all employees can wear one brand of respirators in its various sizes all is well, but the standard is quite clear that other models and sizes must be provided if necessary to obtain correct respirator fit and acceptance by an employee. Also, each respirator selected must be NIOSH certified, and used within the conditions of its certification.

In IDLH atmospheres, only two types of respirators may be used:

- A full face-piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or;
- A combination full face-piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

For non-IDLH atmospheres the standard gives guidance regarding the selection of suitable respirators for particulates, gases and vapors. Either atmosphere-supplying respirators or air-purifying respirators with filters, cartridges or canisters may be used.

Traditionally, the time to change an air-purifying respirator's cartridge or canister has been when breathing becomes more difficult due to dust loading, or when a contaminant is smelled or sensed in some way. Due to the fact that some contaminants cannot be smelled or sensed until an overexposure exists, OSHA no longer allows a contaminant's warning properties such as smell to determine when a respirator's cartridge or canister

must be changed. Instead, respirators must be equipped with an end-of-service-life indicator (ESLI) that has been certified by NIOSH for the contaminant, or a regular change schedule must be instituted to ensure that cartridges or canisters are replaced before the end of their service life. An end-of-service-life indicator (ESLI) provides a warning, such as a color change in a visual indicator, that the cartridge or canister has reached the end of its useful life and needs to be changed.

At present, only a few NIOSH approved respirators have ESLIs, and contaminant breakthrough data for determining a change schedule for cartridges and canisters are not widely available for many contaminants. Even so, change schedules for respirators that do not have ESLIs must be established and implemented. Until ESLIs and cartridge and canister breakthrough times for determining change schedules are available to predict accurate cartridge/canister service life times, employees should be trained to recognize that increased breathing resistance and abnormal odor coming into the respirator means that the respirator cartridges or canisters need replacement. The respirator program administrator (RP A) should be notified if these problems routinely occur despite using the recommended cartridge/canister change schedule.

At present the respirator standard does not contain assigned protection factors (APFs) for various types of respirators, although OSHA has indicated that it will provide this information later. An assigned protection factor (APF) is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of the contaminant in the ambient atmosphere outside the respirator to that inside the enclosure (usually inside the respirator face-piece) under conditions of use. For the present, existing guidance for APFs may be found in the NIOSH Respirator Decision Logic document of 1987, and in the ANSI 288.2-1992 standard. The following table may also be used as a very simplified guide for determining respirator protection factors.

Respiratory Type	Assigned Protection Factor
Air Purifying Half Mask Respirator	10
Air Purifying Full Face-piece Respirator	50
Powered Air Purifier Respirator with Tight Fitting Face-piece	50
Supplied Air Full Face-piece Respirator in Pressure Demand Mode	2000
Full Face-piece Self Contained Breathing Apparatus in Pressure Demand Mode	10000

Medical Evaluations: The new OSHA respiratory protection standard (1910.134) that went into effect in April 1998 differs from its predecessor significantly in the area of medical evaluations that are done for individuals prior to respirator use. For some employees, the additional stresses on the cardio-vascular system associated with using a respirator may be hazardous. Therefore, the standard requires that even before an employee is fit tested for a respirator, the employer shall provide a medical evaluation to determine the employee's ability to use a respirator.

The medical evaluation must be done by a physician or other licensed health care professional that uses a mandatory medical questionnaire (found in Appendix C of 1910.134) or an initial medical examination that obtains the same information as the

medical questionnaire. Prior to giving the medical questionnaire, the health care provider must be given the following information:

- The type and weight of the respirator to be used by the employee;
- The frequency and duration of respirator use;
- The expected physical work effort;
- Additional protective clothing and equipment worn;
- Temperature and humidity extremes that may be encountered;
- A copy of the employer's written respiratory protection program;
- A copy of the 1910.134 standard.

A positive response to any question among questions 1 thru 8, in Section 2, Part A of the questionnaire by the prospective respirator wearer triggers a follow-up medical examination by the health care provider.

Upon completion of the initial evaluation (and follow-up exam if necessary), the health care provider must make a medical determination regarding the employee's ability to use a respirator. The health care provider must give a written report to the employer regarding the employee's ability to use a respirator, any limitations on respirator use, the need for any further medical evaluations, and a statement that the provider has given the employee a copy of the written medical determination report that was provided to the employer.

Respirator Fit Testing: The 1998 respirator standard also contains detailed sections on respirator fit testing. Before an employee is required to use any respirator with a negative or positive pressure tight-fitting face-piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The employee must pass either a qualitative or quantitative fit test to use the respirator. A qualitative fit test exposes a person wearing the same model of respirator they will be using on the worksite to a test atmosphere, such as an irritant smoke. If the wearer detects leakage of the test atmosphere into the respirator while performing a variety of exercises, the respirator does not fit properly, and a different respirator must be fit selected. In a quantitative fit test, the amount of test atmosphere leakage into the respirator is actually measured using detection instruments. Detailed instructions for fit testing respirators and determining "passing" respirator fits are found in Appendix A of the 1910.134 respirator standard.

Use of Respirators: The employer is required to establish and implement procedures for the proper use of respirators. Any condition that results in tight-fitting respirator face piece seal leakage such as facial hair and eyeglass temple pieces, is not permitted. Beards with tight-fitting respirators are not allowed. Employees must perform a user seal check every time they put on a tight-fitting respirator. Procedures for performing a seal check are found in Appendix B-1 of the standard.

Other issues covered in the respirator standard's section on the use of respirators includes preventing employees from removing respirators in a hazardous environment, ensuring the continued effective respirator operation throughout the work shift, personal hygiene

practices for respirator use, and establishing procedures for using respirators in emergencies, IDLH atmospheres or interior structural firefighting situations.

The Maintenance, Care, Cleaning, Storage and Inspection of Respirators: The employer must provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees. Respirators issued for the exclusive use of an employee must be cleaned and disinfected by the user to maintain the respirator in a sanitary condition. Respirators that are shared, emergency use respirators, and respirators used in fit testing must be cleaned and sanitized after each use. Procedures for cleaning respirators can be found in Appendix B-2 of the standard. Respirators must be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. They cannot be stored bunched up to the point that the parts deform.

To maintain the effectiveness of respirators, all routinely used respirators must be inspected before each use and during cleaning. All respirators maintained for use in emergency situations must be inspected at least monthly, and checked for proper function before and after each use.

Inspections must include a check of respirator function, tightness of connections, and the condition of the various parts of the respirator such as the face-piece, head straps, valves, connecting tube and cartridges, canisters or filters, and other elastomeric parts. All SCBAs must be inspected monthly, and tanks of respirators not in use must be recharged whenever the pressure falls to 90% of the manufacturer's recommended pressure level. For emergency use respirators, written records of the inspections must be kept.

Breathing Air Quality and Use In Supplied-Air Type Respirators: Compressed breathing air used in SCBAs and escape respirators with air tanks must meet at least the Requirements for Grade D breathing air as described in the ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989. This document includes specifications for the breathing air components such as oxygen content, hydrocarbon, carbon monoxide, and odors.

Air supplied to respirators from compressors must meet Requirements to assure air purity as well. These Requirements are covered in section (i)(5) of the standard.

Training and Information: The respiratory protection standard requires that the employer provide effective training to employees who are required to use respirators. The training must take place at least annually and more often if necessary. Employees, who are not required to use respirators, but voluntarily use them, must be given the minimal information on respirators found in Appendix D of 1910.134. Employees must be able to demonstrate knowledge of the following:

- Why the respirator is necessary and how improper fit, usage or maintenance can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;

- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- How to properly maintain and store the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;
- The general Requirements of 1910.134.

Program Evaluations: This section of the respirator standard requires the employer to conduct evaluations of the workplace to ensure that the written respiratory program is being effectively implemented. The employer must also consult employees to get their views on program effectiveness, and must observe the employees wearing respirators to see that they are being used properly. Evaluations must be conducted as often as necessary.

Record keeping: The employer has to establish and retain written information regarding exposure assessments, medical evaluations, respirator inspections, and the written respirator program. Qualitative and quantitative fit test records must contain the name of the employee tested; the type of fit test performed; the specific make, model style and size of the respirator tested; the date of the test; and the pass/fail results for qualitative fit tests or the fit factor and strip chart recording or other recording of the test results for quantitative fit tests. The fit test records have to be maintained until the next fit test. Written documentation of employee respirator training and respirator program evaluation results should also be maintained.

Special Information for Abrasive Blasting and Related Operations: NIOSH type CE respirators are required for use by abrasive blasting operators. Currently, NIOSH certifies both continuous flow and positive pressure respirators for abrasive blasting operations. Most continuous flow respirators are recommended by NIOSH only for airborne contaminant concentrations less than or equal to 25 times the OSHA PEL. However, some manufacturers have shown that their continuous flow type CE respirators can offer protection greater than 25 times the PEL. OSHA has accepted the use of some continuous flow type CE abrasive blasting respirators for exposures up to 1000 times the PEL, when the manufacturer has proven that the respirator affords the greater protection factor. Before selecting a type CE continuous flow abrasive blasting respirator, it would be wise to call the nearest OSHA Area Office to determine if the respirator you have chosen is acceptable for exposures greater than 25 times the PEL.

Positive pressure respirators are recommended by NIOSH for airborne concentrations less than 2,000 times the OSHA PEL of a particular contaminant. Furthermore, manufacturer's instructions regarding quality of air, air pressure, and inside diameter and length of hoses must be strictly followed. Use of longer hoses or smaller inside diameter hoses than the manufacturer's specifications, or hoses with bends or kinks may restrict the flow of air to a respirator and negates the NIOSH approval.

Conclusion:

Setting up and maintaining an effective respiratory protection program is hard work, but the effort is necessary in light of the fact that respirators protect workers from hazardous airborne contaminants. You may want to consult a qualified industrial hygienist for setting up an initial respiratory protection program and training company personnel to administer an ongoing program. A sample written respiratory protection program is provided in the following appendix.

C. FOR FURTHER INFORMATION:

The following resources may be consulted for further guidance on establishing and running a respiratory protection program:

The Laborers' Health & Safety Fund of North America. 905 16d1 Street, NW Washington, DC 20006 (202) 628-5465 (202) 628-2613 Fax

Respiratory Protection Standard. 29 CFR 1910.134. U.S. Department of Labor, Occupational Safety and Health Administration. 4/8/98.

Inspection Procedures for the Respiratory Protection Standard. CPL 2-0.120. U.S. Department of Labor, Occupational Safety and Health Administration. 9/25/98.

NIOSH Guide to Industrial Respiratory Protection. DHHS Publication No. 87-116. U.S. Department of Health and Human Services, Centers for Disease Control, National Institute of Occupational Safety and Health (NIOSH). 9/1/87.

American National Standard for Respiratory Protection. ANSI 288.2-1992. American National Standards Institute, New York. 8/6/92.

Small Entity Compliance Guide for the Respiratory Protection Standard. U.S. Department of Labor, Occupational Safety and Health Administration. [Http://www.osha-slc.gov/publications/secgrev.pdf](http://www.osha-slc.gov/publications/secgrev.pdf).

The CCGs of 1910.134. Craig Colton. Occupational Safety and Health, August 1998.