



# Construction Health & Safety Program

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## Reviewed and Revised

Date:	Signature:

# Management Safety Policy

## For CCG

The management of this organization is committed to providing employees with a safe and healthful workplace. It is the policy of this organization that employees report unsafe conditions and do not perform work tasks if the work is considered unsafe. Employees must report all accidents, injuries, and unsafe conditions to their supervisors. No such report will result in retaliation, penalty, or other disincentive.

Employee recommendations to improve safety and health conditions will be given thorough consideration by this company. Management will give true attention to and provide the financial resources for the correction of unsafe conditions. Management will promote and influence safe behavior. This will be accomplished by both positive reinforcement of correct and safe activity, and by disciplinary action for those who willfully or repeatedly work in an unsafe manner.

Disciplinary action will take the form of

- 1) Written warning or,
- 2) Written warning and suspension without pay or,
- 3) Termination of employment.

Management reserves the right to terminate the employment of any employee at any time for violation of company policies.

Management will participate in establishing and maintaining an effective safety program. This will include the following:

- Holding all management and supervisory staff accountable for their safety responsibilities in their respective departments, jobs, crews or workplaces;
- Providing safety and health education and training as needed; and
- Reviewing and updating workplace safety policies, practices and performances.

This policy statement serves to express this company's commitment to and involvement in providing our employees a safe and healthy workplace. This workplace safety and health program will be incorporated as the standard of practice for this organization. Compliance with these safe practices and those of any regulatory agency will be required of all employees as a condition of continued employment.

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Signature of CEO/President

Date

# Safety Committee

## **Safety Committee Organization**

- A safety committee is established as a management tool to recommend improvements to workplace safety programs and to identify corrective measures needed to eliminate or control recognized safety and health hazards.
- Safety committee employer representatives will not exceed employee representatives.

## **Responsibilities**

- The safety committee will be responsible for assisting management in communicating procedures for evaluating the effectiveness of control measures used to protect employees from safety and health hazards in the workplace.
- The safety committee will be responsible for assisting management in reviewing and updating workplace safety rules based on accident investigation findings, any inspection findings, and employee reports of unsafe conditions or work practices; and accepting and addressing anonymous complaints and suggestions from employees.
- The safety committee will be responsible for assisting management in updating the workplace safety program by evaluating employee injury and accident records, identifying trends and patterns, and formulating corrective measures to prevent recurrence.
- The safety committee will be responsible for assisting management in evaluating employee accident and illness prevention programs, and promoting safety and health awareness and co-worker participation through continuous improvements to the workplace safety program.
- Safety committee members will participate in safety training and be responsible for assisting management in monitoring workplace safety education and training to ensure that it is in place, that it is effective, and that it is documented.
- Management will provide written responses to safety committee written recommendations.

## **Meetings**

- Safety committee meetings are held quarterly and more often if needed and each committee member will be compensated at his or her hourly wage when engaged in safety committee activities.
- Management will post the minutes of each meeting in a conspicuous place and the minutes will be available to all employees.
- All safety committee records will be maintained for not less than three calendar years.

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# General Safety and Health Rules

Our management is responsible for implementing major decisions, policies and safety and health procedures. Specific safety and health procedures that are required by OSHA will be put in writing such as: lockout, right to know, fall protection, confined space, respiratory program, etc. A copy of our written safety program will be available on every jobsite, either in the jobsite trailer, the gang box, or with the foremen. The required OSHA posters will be posted at the main office.

CCG will inform and enforce the following safety rules:

**All of our safety rules must be obeyed. Failure to do so will result in strict disciplinary action.**

1. Wear appropriate clothing and use sun block to prevent sunburn where necessary.
2. Watch where you are walking. Do not run. Keep your mind on your work at all times.
3. The use of illegal drugs or alcohol or being under the influence during working hours shall be cause for termination. Inform your supervisor if taking strong prescription drugs that warn against driving or using machinery.
4. Do not distract the attention of fellow workers or engage in horseplay. Do not engage in any act which would endanger another employee.
5. Keep your working area free from rubbish and debris. A clean job is the start of a safe job.
6. Do not use a compressor to blow dust or dirt from your clothes, hair, or hands.
7. Report any fear of walking at heights to your supervisor.
8. Know where fire extinguishers are located and how to use them.
9. Lift correctly - with legs, not the back. If the load is too heavy GET HELP. Do stretching exercises prior to work activities. Approximately twenty percent of all construction related injuries result from lifting materials.
10. Keep back at least 20' from all power lines.
11. Nobody but the operator shall be allowed to ride on equipment unless the equipment is designed to carry a passenger.
12. Do not use power tools and equipment until you have been properly instructed in the safe work methods and become authorized to use them. Use tools according manufacturers specifications. Always use the required Personal Protective Equipment when using hand and power tools.
13. Do not use tools with visible damages or functional issues. If damages or functional issues exist, discontinue use, tag, and remove from service.

14. Do not remove, displace, damage, or destroy any safety device or safeguard on equipment or machinery.
15. Barricade danger areas. Guard rails or perimeter cables may be required. Do not enter an area which has been barricaded.
16. If you must work around power shovels, trucks, rough-terrain fork-lifts, dozers, or other heavy equipment, make sure operators can always see you.
  - Never walk within the swing radius of equipment counterweights.
  - Never stand next to trucks when load straps are being released.
  - Barricades are required for cranes.
  - High visibility vests may be used to increase your visibility.
17. Never oil, lubricate, or fuel equipment while it is running or in motion.
18. Before servicing, repairing, or adjusting any powered tool or piece of equipment, disconnect it, lock out the source of power, and tag it out.
19. Excavations over five feet deep must be shored or sloped as required. Keep out of trenches or cuts that are not properly shored or sloped. Excavated material or other debris shall not be stored nearer than two feet from the edge of the excavation. Excavations less than 5 feet will require cave in protection where conditions indicate possible side failure.
20. Practice the following safety procedures when using ladders:
  - Use the "four to one" rule when using a ladder. One foot of base for every four feet of height.
  - Portable ladders in use shall be equipped with safety feet unless the ladders are tied, blocked or otherwise secured. Ladders must extend three feet above landing on roof for proper use.
  - A Frame ladders must be remain fully extended with braces locked during use, may not be leaned.
  - Defective ladders must be properly tagged and removed from service.
  - Keep ladder bases free of debris, hoses, wires, materials, etc.
  - Ladders must extend (3) feet above the upper landing's surface when used as a point of access / egress.
  - Do not use the top two rungs of any ladder.
  - Ladders must stay a minimum distance of 6' from any break in elevation where a fall of 6' or more exists
  - An additional distance must be added the 6' distance per the amount of rungs which will be used to work off of (i.e. employee working on the 5<sup>th</sup> rung of a ladder must set the ladder back from an edge 5' plus the 6' minimum = 11').
21. Only build scaffolds if you have obtained competent person training. If so, only build scaffold according to manufacturers' recommendations and OSHA's 1926 Subpart L, Scaffolding.
  - All Scaffold components (Supported, Swings, and Mobil) must be free of damage.
  - Scaffolds over 10' must have guardrails on all open sides.
  - Scaffold planks shall be properly lapped, cleated or otherwise secured to prevent shifting.
  - Scaffolds must be secured vertically and horizontally through the use of anchors, ties, and/or guys at required heights (competent person training)

- Mobile Scaffolds must have locking devices present on all wheels.
  - No riding mobile scaffolds.
  - Only trained personnel may be allowed to operate a swing stage.
  - All anchors, PFA's, and life lines must be checked prior to the use of a swing stage.
  - All personnel within a swing stage must have an independent life line and anchor.
  - All Anchors designed for fall protection must be adequate per OSHA's Sub Part L and Sub Part M (Scaffold and Fall Protection).
22. Use of Lifts (Scissors Lift, Aerial Lift, Articulating Boom Lifts, etc) may only be done so by trained personnel. Manufacturer's specifications must be followed at all times.
  23. Use only extension cords of the three-prong type. Use extension cords of 12 gauge or lower. Use ground fault circuit interrupters at all times with any temporary power supply. No exposed wiring, frays, or cuts may be present on the extension cords.
  24. 100% FALL PROTECTION IS REQUIRED AT 6'-0" AND ABOVE (100% tie-off means the harness and lanyard are always connected to anchorage). ZERO TOLERANCE FOR NEGLIGENCE.
  25. ANYONE OUTSIDE A WARNING LINE SYSTEM EXPOSED TO A FALL WITHIN 6' AND/OR OUTSIDE A PERIMETER GUARDRAIL SYSTEM MUST BE PROTECTED THROUGH THE USE OF PERSONAL FALL ARREST SYSTEMS (i.e. Harness, Retractable Lanyard, Approved Anchor). **VIOLATION OR NONCOMPLIANCE WILL BE GROUNDS FOR TERMINATION.**
  26. All equipment used for fall protection must be inspected prior to use.
  27. All Anchors used for fall protection must be able to hold, at a minimum, 5,000 LB's per employee.
  28. Know what emergency procedures have been established for your job site. (Location of emergency phone, first aid kit, stretcher location, fire extinguisher locations, evacuation plan, etc.).
  29. Never enter a manhole, well, shaft, tunnel or other confined space which could possibly have a hazardous atmosphere because of lack of oxygen, or presence of toxic or flammable gas, or has a possibility of engulfment by solids or liquids.
    - Only a qualified person will test the confined area with an appropriate detector before entry.
    - Wear the necessary personal protective equipment.
    - Provide ventilation by blowing fresh air into the confined space.
    - An attendant (hole-watch) may be required to be stationed at the entrance.
  30. Only safety gas and diesel cans are allowed for the transport of liquid combustibles.
  31. This is a drug and alcohol-free company. Absolutely NO DRUGS OR ALCOHOL are allowed.

# CCG Safety Plan

## Responsibilities

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### **Senior Managers / Managers**

- Ensure that safety is adequately budgeted for the department, job, etc.
- Communicate safe work practices regularly within the department.
- Attend departmental and company-wide safety meetings.
- Formally recognize outstanding safety performance by any/all personnel.
- Assist the Supervisor/Superintendent or any other personnel with the safety process as needed or as requested. This can include formal worksite periodic inspections.
- Uphold and enforce all known safe work practices.

### **Supervisors / Superintendents**

- Ensure new-hire orientation is given to new employees, or is followed up at the work level
- Ensure employees are given training that includes safe work practices on equipment, tools, machines, processes, etc.
- Personally conduct--or designate a qualified personnel to conduct-- regular inspections of the workplace
- Conduct frequent (daily) work discussions prior to the start of work that include safe work practices
- Uphold and enforce safe work practices. This includes influencing safe behavior by positive reinforcement such as recognition of worker's safe work performance, and/or monetary or gift awards for safe behavior. Enforcement action can also influence safe behavior when applied towards workers who blatantly perform unsafe acts, or who continually perform in an unsafe manner
- Investigate all incidents and take immediate corrective action to prevent re-occurrence
- Provide safety meetings on a regular basis and require attendance of all workers

### **All Employees**

- Are to follow safe work practices, and if they are unsure of what is the correct/safe way to perform a task or a job, they are to ask their foreman, supervisor or manager
- Must immediately report all unsafe equipment or tools to their foreman, supervisor or manager. This includes reporting unsafe behavior of other workers, if these workers are approached and remain unwilling to correct their unsafe actions or conditions.
- Are to uphold the safe work practices this company has established
- If injured on the job, or become ill, immediately inform their supervisor, foreman or manager

## **WORKSITE ANALYSIS**

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We will conduct a worksite analysis, through systematic actions that provide information as needed to recognize and understand the hazards and potential hazards of our workplace. Listed below are types of worksite analysis actions that can assist with making an inventory of potential hazards in our workplace:

1. Job safety analysis.
2. Comprehensive hazard surveys (insurance inspections, OSHA On-site, etc.).
3. Hazard analysis of changes in the workplace (new equipment, new processes).
4. Regular site safety and health inspections (employee and management).
5. Employee report of hazards or potential hazards.
6. Accident and incident investigations with corrective actions and follow-up.
7. Injury and illness trend analysis.
8. Personal protective equipment assessment.
9. Ergonomic analysis.
10. Specific identification of confined spaces.
11. Identification of energy sources for specific machines.
12. Copies of written inspections and surveys by: fire department, in-house as required by safety and health standards (e.g., overhead crane inspections, powered industrial truck daily inspection, etc.).

## **JOB SAFETY ANALYSIS**

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CCG will utilize job safety analysis to determine potential hazards and identify methods to reduce exposure to the hazards.

Job Safety Analysis (JSA) is a method of planning for safety and health. There are three parts to the JSA.

1. The first component of a JSA is breaking down a job or task into the specific steps it takes to complete the job. Although this can be done in small detail, typically only the major steps are listed. This often results in five to ten steps. The steps are listed in chronological order, listing the first thing that must be done, then what comes next, and so on.
2. The second component of a JSA is to list all the hazards that are involved in each step. There may be many hazards that get listed next to some steps and may not be any associated with some steps.
3. The third step is to write down how each hazard will be eliminated or controlled. In other words, describe what needs to be done in order to perform that task safely.

## **JOB SITE INSPECTIONS**

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CCG will conduct daily job site inspections. Hazards will be documented, reviewed, and corrections will be made in a timely manner. More detailed, written inspections will be conducted by the Project Manager and/or a third party on a regular basis. The Project Manager, Competent Person, and/or Lead Person or other designated safety person will tour each job site and observe potential safety/health hazards, and develop a plan for safeguarding this company's workers which may include the following:

1. Removing the hazard.
2. Guarding against the hazard as required by OSHA.
3. Providing personal protective equipment and enforcing its use.
4. Training workers in safe work practices.
5. Coordinating protection of workers through other contractors.

A record of all safety inspections and correctional steps will be kept.

## **HAZARD PREVENTION AND CONTROL**

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- If feasible, engineering controls will be used first, rather than immediately providing personal protection equipment (PPE).
- Safe work practices will be developed and employees will be trained on using these safe work practices to avoid injury and illnesses. This may include the implementation of task or job hazard analyses.
- PPE will be provided as necessary, and its use enforced by Supervisory and Management staff.
- If feasible, administrative controls, such as reducing the duration of exposure can be implemented.
- Equipment, tools, machines, trucks, vehicles, and structures/facilities etc., need to be maintained in good working order by a continued preventative maintenance process.
- All workers will be made aware of workplace emergency procedures. Training on this process will begin at orientation. Drills will be conducted periodically to assist in making all workers aware of the procedures in the event of an emergency such as fire or explosion.

## **SAFETY AND HEALTH TRAINING**

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### **Safety and Health Orientation**

Workplace safety and health orientation begins on the first day of initial employment or job transfer. Each employee should have access to a copy of the written safety program, through his or her supervisor, for review and future reference, and will be given a personal copy of any safe work practices, policies, and procedures pertaining to his / her job. Supervisors should question employees and should answer employees' questions to ensure knowledge and understanding of safe work practices, policies, and job-specific procedures. Supervisors are responsible to inform all employees that compliance with the safe work practices is required.

## **Job-Specific Training**

- Managers, Supervisors and Foremen should receive basic safety and health training as it relates to their positions
- Supervisors will initially train employees on how to perform assigned job tasks safely.
- Supervisors will carefully review with each employee any specific safe work practices, policies, and procedures that are applicable.
- Supervisors will observe employees performing the work. If necessary, the supervisor will provide a demonstration using safe work practices, or remedial instruction to correct training deficiencies before an employee is permitted to do the work without supervision.
- All employees will receive safe operating instructions on seldom-used or new equipment before using the equipment.
- Supervisors will review safe work practices with employees before permitting the performance of new, non-routine, or specialized procedures.

## **Periodic Retraining of Employees**

All employees will be retrained periodically on safe work practices, policies and procedures, and when changes are made to the written safety program.

If necessary, individual employees will be retrained after the occurrence of a work-related injury caused by an unsafe act or work practice, or when a supervisor observes employees displaying unsafe acts, practices, or behaviors.

CCG will provide training to assure the requirements of OSHA standards are met and continuously evaluate employee training needs to keep workers safe and healthy on the job.

1. New Employee Orientation: New employees will receive training on the company safety and health management system, safe work practices and expectations, and specific safety and health training for the tasks that they will perform.
2. After inspecting a job site, the Project Manager, Competent Person, and/or Lead Person will identify and evaluate all potential hazards for potential of serious injuries and probability of an accident. Actions will be taken to minimize the hazards and protect the workers.
3. The Project Manager, Competent Person, and/or Lead Person or other designated site person will appraise the skill and knowledge level of exposed workers, and provide any needed training.
4. Where safety and health training is needed, appropriate training will be provided.
  - Hazards will be identified.
  - Necessary precautions will be explained.
  - Training length and level of detail will be determined by the severity of the hazards and the requirements of OSHA.

5. Records will be maintained for all training sessions with descriptions of topics covered and names of workers trained.
6. Toolbox Talks: Toolbox talks will be conducted regularly. Topics covered will include:
  - The safe work practices necessary for that day's work.
  - Any safety concerns workers may have.
  - Brief refresher training on relevant safety topics (topics to be provided by the Project Manager, Competent Person, and/or Lead Person)

## **FIRST AID AND MEDICAL ASSISTANCE**

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There will be adequate first aid supplies and /or an adequate first aid kit available at each workplace. Where required, or in the case of an emergency where the workplace is located in a remote location and emergency medical assistance cannot arrive within a few minutes, there will be a designated certified first aid (and possibly CPR) trained employee who can assist in first aid emergency cases. Employees who receive work related injuries or illnesses will be given immediate attention in regards to the nature of their injury or illness.

## **INCIDENT INVESTIGATION**

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### **Incident Investigation Procedures**

The supervisor at the location where the incident occurred will perform an incident investigation. Incidents can include property damage, near misses and workplace injuries and illnesses. These investigations are to assess the nature and the cause of the incident, not to place blame on personnel. Supervisors need to investigate incidents using procedures that include:

- Implement temporary control measures to prevent any further injuries to employees or damage to equipment or property or the public.
- Review the equipment, operations, and processes to gain an understanding of the accident situation.
- Identify and interview each witness and any other person who might provide clues to the causes.
- Investigate causal conditions and unsafe acts; make conclusions based on existing facts.
- Complete the incident investigation report.
- Provide recommendations for corrective actions.
- Indicate the need for additional or remedial safety training, if needed.

Incident investigation reports must be submitted to the designated management personnel as soon as possible after the incident.

### **Incident Report Form**

The incident report form should be a simple format for the supervisor to complete in a timely manner. It can be similar to the OSHA 301 "Injury and Illness Incident Report" form. To correctly assess the nature and causes of the incident, the form should contain questions such as

- What was the employee doing just prior to the incident
- Were there any witnesses? What were their names? Did the witnesses provide statements of the incident?

- What happened? (“Ladder kicked out and employee fell to floor”, “forklift struck wall, wall collapsed.”)
- What part of the body was affected by the incident? (eye, arm, leg, fingers, hand, etc.) And what was the nature of the injury? (object in eyes, fractured arm, sprained leg, lacerated finger, cut in right hand, etc.).
- What was the object or substance that directly harmed the employee (if substance/object is known).
- Was the injury fatal?

## **RECORD KEEPING PROCEDURES**

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The company will control and maintain all employee accident and injury records. Records are maintained for a minimum of five (5) years following the end of the year to which they relate. The data on the Injury and Illness log and posting of the Summary of Work-related injuries and illnesses will be in accordance with government regulations. The following will be included in the record keeping process:

- Log of Work-related Injuries and Illnesses (OSHA form 300)
- Summary of Work-related Injuries and Illnesses (OSHA form 300A)
- Incident investigation reports (OSHA form 301 or similar)
- Workers' Compensation Notice of Injury

## **EXCAVATION SAFETY**

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Pre-job planning is vital to accident-free excavations and trenching; safety cannot be improvised as work progresses.

The following concerns must be addressed by a qualified person.

1. Evaluate soil conditions and select and construct appropriate protective systems in accordance with OSHA CFR 1926, Excavation, Trenching and Shoring.
2. You must use protective systems if the trench is 5’ or deeper.
3. If the trench is less than 5’ but is hazardous due to soil or the nature of the trench, then you must use protective systems.
4. Appropriate protective systems to prevent a cave-in may include:
  - trench boxes,
  - shoring,
  - benching of trench sides,
  - sloping of trench sides.
5. Inspect the site daily at the start of each shift, following a rainstorm, or after any other hazard-increasing event.
6. Contact MISS DIG to locate underground lines at least 3 days prior to excavating.
7. Plan for traffic control when necessary
8. Determine proximity to structures that could affect choice of protective systems. For example, ensure roads, sidewalks, or buildings are not too close to allow the use of a trenchbox or adequate sloping.

9. Test for low oxygen, and hazardous gases and vapors, especially when gasoline engine-driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks. Fuel-powered equipment produces carbon monoxide in the exhaust and must not be used without adequate ventilation. Provide appropriate respiratory protection when necessary.
10. Provide safe access into and out of the excavation. If the excavation is 4' or greater, ensure a ladder is within 25' of workers in the excavation.
11. Provide appropriate protections if water accumulation is a problem. Water flow and accumulation must be inspected and must be controlled.
12. Keep excavations open the minimum amount of time needed to complete operations.

## **ELECTRICAL SAFETY**

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Electrical safety involves two primary issues:

- Powerlines,
- Temporary and permanent electrical wiring and equipment.

To avoid electrical incidents, several basic safety rules must be followed:

1. Stay at least 10 feet back from powerlines, in ALL directions.
2. Do not store materials under powerlines.
3. Mark powerlines on the job site with warning signs below.
4. Use ground fault circuit interrupters (GFCI) whenever plugging into temporary power or using an extension cord.
5. Extension cords and trailing cords with missing ground prongs must be removed from service.
6. Extension cords and trailing cords with cuts must be removed from service.
7. Do not operate wet power tools.
8. Keep extension cords from being damaged in doorways or being run over.
9. Keep extension cords out of wet areas.
10. Never wire anything yourself or attempt to make electrical repairs. Leave that for an electrician.
11. Assume all wires and electrical boxes are live, unless you are certain they are not.
12. Do not store any materials within 3 feet of electrical boxes.

## **PERSONAL PROTECTIVE EQUIPMENT**

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1. Hard hats will be worn on job sites at all times.
2. Eye protection will be worn when there are potentials of hazards from flying objects or particles, chemicals, arcing, glare, or dust.
3. Leather work boots shall be worn to protect from falling objects, chemicals, or stepping on sharp objects. Safety toe footwear may be necessary in some instances. Athletic or canvas-type shoes shall not be worn.
4. Protective gloves or clothing shall be worn when required to protect against a hazard.
5. Harnesses and lanyards shall be utilized for fall protection as requir

# Emergency Action Plan

## CCG

### **SCOPE**

The following Emergency Action Plan applies to all situations where a particular OSHA Standard specifies that a plan be established.

### **ELEMENTS**

A. Emergency Escape Procedures and Routes

Emergency escape procedures and route assignments have been posted in each work area and all employees have been trained by supervision in the correct procedures to follow. New employees are trained when assigned to the work area. A sample escape procedure and route sheet that is posted in work areas is attached.

B. Procedures for Employees Who Remain to Operate Critical Operations Before They Evacuate

The attached sheet describes those operations, procedures, and personnel required for critical operations before the assigned personnel evacuate during emergency situations. A description of the special training provided is also included.

C. Employee Accountability Procedures After Evacuations

Each company supervisor is responsible for accounting for all their assigned employees by the supervisor or his or her designee by reporting go to a predetermined, designated rally point and conduction a head count. Each assigned employee will be accounted for by name. All supervisors are required to report their head count (by name) to the Emergency Evacuation Coordinator. A summary of the evacuation rally points and the supervisors and their assigned employees who must report to the designated rally point is attached.

D. Rescue and Medical Duties

Specific rescue and medical duties have been assigned to designated company individuals. These personnel have received special training and instructions to properly carry out these assignments. A list of individuals assigned and a summary of their training is attached for review.

E. Preferred Means of Reporting Fire and Emergencies

All company fires and emergencies will be reported by the Project Manager, Competent Person, and Lead Personnel in charge.

F. Emergency and Fire Protection Coordinator

The Company's Emergency and Fire Protection Plan Coordinator:

<u>Gaston Corradi</u>	<u>Senior Project Manager</u>	<u>305.919.7748</u>
Name	Title	Ph.

The Coordinator may be contacted for further information or explanation of the Company's Emergency and Fire Protection Plans.

G. Alarm System

Company employee alarm systems for notifying all employees in case of an emergency are done so verbally and via the use of phones (landline and cellular)

When required by specific OSHA standards, the company will comply with OSHA standard 1910.165.- Employees Alarm Systems. These requirements are shown on the attached sheet.

H. Fire Protection and Prevention Assignments

Appropriate company personnel have been assigned specific fire protection and prevention responsibilities. Fire prevention equipment must be routinely inspected and tested. Systems that can increase the likelihood or severity of a fire must be inspected and maintained.

**EMPLOYEE ACCOUNTABILITY  
FOLLOWING AN EMERGENCY EVACUATION**

Each company supervisor is responsible for accounting for each of his or her assigned employees following an emergency evacuation. This will be accomplished by following the procedures shown below.

Employee Accountability

1. Rally points have been established for all company evacuation routes and procedures. These points are designated on each posted work area escape route.
2. All work area supervisors and employees must report to their designated rally points immediately following an evacuation.
3. Each employee is responsible for reporting to his or her supervisor so an accurate headcount can be made. Supervisors will check off all those reporting and report those not checked off as missing to the Emergency Evacuation coordinator.
4. The Emergency Evacuation coordinator (Project Manager, Lead Person) will be located at one of the following locations:
  - A. Primary Location: Site Entrance and Exit
  - B. Secondary Location: Location Agreed Upon by Site Coordinators
5. The Emergency Evacuation Coordinator will determine the method that will be utilized to locate missing personnel.

SPECIAL INSTRUCTIONS:

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EMERGENCY PLAN AND FIRE PROTECTION COORDINATOR: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# **Hazard Communication Program**

## **For CCG**

### **I. General**

The purpose of this instruction is to ensure that CCG is in compliance with the Occupational Safety and Health Administration's Hazard Communication Standard (HCS) 29 CFR 1910.1200.

The office administrators alongside the project managers are designated as the Hazard Communication Program Coordinators and as such act as the representatives for the President of CCG, who has overall responsibility.

In general, each employee in the facility will be apprised of the substance of the HCS, the hazardous properties of chemicals they work with, and measures to take to protect themselves from these chemicals.

### **II. List of Hazardous Chemicals**

The Hazard Communication Coordinator will maintain a list of all hazardous chemicals used in the facility, and update the list as necessary. The hazardous chemical list will be updated upon receipt of hazardous chemicals at the facility. The list of hazardous chemicals is maintained at the main office.

### **III. Material Safety Data Sheets (MSDS's)**

The Hazard Communication Coordinator will maintain an MSDS on every substance listed on the hazardous chemical list in. The MSDS will consist of a fully completed OSHA Form 174 or equivalent. The Hazard Communication Coordinator will ensure that all MSDS's are kept in at the main office. All MSDS's will be readily available to all employees.

The HazCom Coordinator is responsible for acquiring and updating MSDS's. The Coordinator will review each MSDS for accuracy and completeness. All new procurements for the facility must be cleared by the Hazard Communication Coordinator. Whenever possible, the least hazardous substance will be procured. MSDS's that meet the requirements of the HCS must be fully completed and received at the facility either prior to or at the time of receipt of the first shipment of any potentially hazardous chemical purchased from a vendor. It may be necessary to discontinue procurements from vendors failing to provide approved MSDS's in a timely manner.

#### **IV. Labels and Other Forms of Warning**

All Project Managers and Lead Personnel are designated to ensure that all hazardous chemicals in the facility and/or construction area are properly labeled. Labels should list at least the chemical identity, appropriate hazard warnings, and the name and address of the manufacturer, importer, or other responsible party. Project Managers and Lead Personnel will refer to the corresponding MSDS to verify label information. Immediate use containers, small containers in which materials are poured for use on that shift by the employee drawing the material, do not require labeling. To meet the labeling requirements of HCS for other in-house containers, refer to the label supplied by the manufacturer. All labels for in-house containers will be approved by the Project Manager and Lead Personnel prior to their use.

The Project Manager and/or Lead Personnel will check on a monthly basis to ensure that all containers in the facility are labeled and that the labels are up to date.

#### **V. Training**

Each employee who works with or is potentially exposed to hazardous chemicals will receive initial training on the HCS and the safe use of those chemicals. Additional training will be provided for employees whenever a new hazard is introduced into their work areas. Hazardous chemical training will be conducted by the Project Manager and/or Lead Personnel

The training will emphasize these elements:

- **A summary of the standard and this written program;**
- **Hazardous chemical properties including visual appearance and odor and methods that can be used to detect the presence or release of hazardous chemicals;**
- **Physical and health hazards associated with potential exposure to workplace chemicals;**
- **Procedures to protect against hazards, e.g., personal protective equipment, work practices, and emergency procedures;**
- **Hazardous chemical spill and leak procedures; and,**
- **Where MSDS's are located, how to understand their content, and how employees may obtain and use appropriate hazard information.**

The Hazard Communication Coordinator will monitor and maintain records of employee training and advise the facility manager on training needs.

#### **VI. Contractors and Other "Outside" Employers**

The Hazard Communication Coordinator, upon notification from management, will advise outside contractors of any chemical hazards which may be encountered in the normal course of their work on the premises. Likewise, contractors and other outside employers will be required provide information to the Hazard Communication Coordinator regarding any hazardous materials they will introduce into our facilities. This information may be conveyed by providing MSDS's to the appropriate personnel.

#### **VII. Non-Routine Tasks**

Supervisors contemplating a non-routine task, will consult with the Hazard Communication Coordinator and ensure that employees are informed of chemical hazards associated with the performance of these tasks and appropriate protective measures. This will be accomplished by a meeting of supervisors and the Hazard Communication Coordinator with affected employees before such work is begun.

#### **VIII. Additional Information**

Further information on this written program, the Hazard Communication Standard, and applicable MSDS's is available by contacting the main office.

# Hearing Conservation Program

For  
CCG

## I. OBJECTIVE

The objective of the CCG Hearing Conservation Program is to minimize occupational hearing loss by providing hearing protection, training, and annual hearing tests to all persons working in areas or with equipment that have noise levels equal to or exceeding an eight-hour time-weighted average (TWA) sound limit of 85 dBA (decibels measured on the A scale of a sound level meter). A copy of this program will be maintained by all affected departments. A copy of OSHA's Hearing Conservation Standard, 29 CFR 1910.95, can be obtained from the main office. A copy of the standard will also be posted in areas with affected employees.

## II. ASSIGNMENT OF RESPONSIBILITY

### A. Management

1. Use engineering and administrative controls to limit employee exposure.
2. Provide adequate hearing protection for employees.
3. Post signs and warnings in all high noise areas.
4. Conduct noise surveys annually or when new equipment is needed.
5. Conduct annual hearing test for all employees.
6. Conduct hearing conservation training for all new employees.
7. Conduct annual hearing conservation training for all employees.

### B. Employees

1. Use company-issue approved hearing protection in designated high noise areas.
2. Request new hearing protection when needed.
3. Exercise proper care of issued hearing protection.

## III. PROCEDURES

### A. Noise Monitoring

1. Monitoring for noise exposure levels will be conducted by the competent person. It is the responsibility of the individual departments to notify Project Managers when there is a possible need for monitoring. Monitoring will be performed with the use of sound level meters and personal dosimeters at the discretion of CCG.
2. Monitoring will also be conducted whenever there is a change in equipment, process or controls that affect the noise levels. This includes the addition or removal of machinery, alteration in building structure, or substitution of new equipment in place of that previously used. The

responsible supervisor must inform CCG when these types of changes are instituted.

#### B. Employee Training

1. Affected employees will be required to attend training concerning the proper usage and wearing of hearing protection. The training will be conducted by CCG or a designated representative, within a month of hire and annually thereafter.
2. Training shall consist of the following components:
  - a. how noise affects hearing and hearing loss;
  - b. review of the OSHA hearing protection standard;
  - c. explanation of audiometric testing;
  - d. rules and procedures;
  - e. locations within company property where hearing protection is required; and
  - f. how to use and care for hearing protectors.
3. Training records will be maintained by CCG (see Attachment A).

#### C. Hearing Protection

Management, supervisors, and employees shall properly wear the prescribed hearing protection while working or traveling through any area that is designated as a high noise area.

1. Hearing protection will be provided at no cost to employees who perform tasks designated as having a high noise exposure and replaced as necessary. It is the supervisor's responsibility to require employees to wear hearing protection when noise levels reach or exceed 85 dBA. Those employees will have the opportunity to choose from at least two different types of hearing protection.
2. Personal stereo headsets, or "Walkmen," are not approved for hearing protection and are not permitted in any operating area of company property.
3. Signage is required in areas that necessitate hearing protection. It is the responsibility of CCG to provide signage to the appropriate areas.
4. Preformed earplugs and earmuffs should be washed periodically and stored in a clean area. Foam inserts should be discarded after each use. Hands should be washed before handling preformed earplugs and foam inserts to prevent contaminants from being placed in the ear.
5. CCG will keep a log of the areas or job tasks designated as requiring hearing protection, as well as the personnel affected by this Hearing Conservation Program (see Attachment B).

#### D. Audiograms/Hearing Tests

1. Employees subject to the Hearing Conservation Program who have time-weighted average (TWA) noise exposures of 85 dBA or greater for an eight (8) hour work shift will be required to have both a baseline and annual audiogram. The audiograms will be provided by CCG and conducted with no cost to the employee.
2. The baseline audiogram will be given to an employee within one (1) month of employment with CCG and before any exposure to high noise levels. Annual audiograms will be performed within one year from the date of the previous audiogram. It is the responsibility of the individual and CCG to schedule the annual audiogram.
3. If an annual audiogram shows that an employee has suffered a standard threshold shift, the employee will be retested within thirty (30) days of the annual audiogram. If the retest confirms the occurrence of a standard threshold shift, the employee will be notified in writing within twenty-one (21) days of the confirmation. Employees who do experience a standard threshold shift will be refitted with hearing protection and provided more training on the effects of noise.





# **Personal Protective Equipment (PPE)**

**For  
CCG**

# Written Hazard Assessment for Selecting Personal Protective Equipment

- Identifying and evaluating equipment and processes
- Reviewing injury/accident/incident records
- Reviewing previously selected PPE

Date of Evaluation: \_\_\_\_\_

Workplace  
Evaluated By: \_\_\_\_\_

Evaluator Title: \_\_\_\_\_

<b>HAZARD TYPE</b> [impact, penetration, chemical--(corrosive, reactive, toxic, irritant, flammable, etc), heat, harmful (or nuisance) dust, light / radiation, electrical, biohazard, noise, other]	<b>LOCATION/ SOURCES/ TASKS</b>	<b>ANALYSIS OF RISK</b> (Low/ Medium / High)		<b>PPE (REQUIRED)</b>	<b>PPE (OPTIONAL)</b>
		Level of Risk	Seriousness of Potential Injury		



# **Employee Acknowledgement of Personal Protective Equipment Training**

I,\_, have been trained in the company's personal protective equipment program. The protective equipment required in my work area has been explained and I am aware of the company's policy and requirement.

---

Employee's Signature

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Date

---

Supervisor's Signature

---

Date

# Fall Protection Safety Program

## For CCG

The following Fall Protection Plan is prepared for the prevention of injuries associated with falls. A Fall Protection Plan must be developed and evaluated on a site by site basis.

### I. STATEMENT OF COMPANY POLICY

CCG is dedicated to the protection of its employees from on-the-job injuries. All employees of CCG have the responsibility to work safely on the job. The purpose of this plan is:

- (a) To supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on this job and;
- (b) To ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start of erection.

This Fall Protection Plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as, identifying specific activities that require non-conventional means of fall protection. These areas include:

- a. Connecting activity (point of erection).
- b. Leading edge work.
- c. Unprotected sides or edge.
- d. Grouting.

This plan is designed to enable employers and employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces. Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify the foreman of the concern and the concern addressed before proceeding.

Safety policy and procedure on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to the company; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

It is the responsibility of ALL G3C CONTRACTOR EMPLOYEES to implement this Fall Protection Plan. PROJECT MANAGERS, COMPETENT PERSONS AND LEAD PERSONNEL are responsible for continual observational safety checks of their work operations and

to enforce the safety policy and procedures. The foreman also is responsible to correct any unsafe acts or conditions immediately. It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the foreman. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees. Any changes to this Fall Protection Plan must be approved by the Project Manager, Competent Person, and/or Lead Person on site.

## **II. FALL PROTECTION SYSTEMS TO BE USED ON THIS PROJECT**

### **Control Zone System**

A controlled access zone means an area designated and clearly marked, in which leading edge work may take place without the use of guardrail, safety net or personal fall arrest systems to protect the employees in the area. Control zone systems shall comply with the following provisions:

1. When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.

When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.

2. The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
3. The control line shall be connected on each side to a guardrail system or wall.
4. Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
5. Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
6. Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) from the walking/working surface.
7. Each line shall have a minimum breaking strength of 200 pounds (.88 kN).

### **Holes**

All openings greater than 12 in. x 12 in. will have perimeter guarding or covering. All predetermined holes will have the plywood covers made in the precasters' yard and shipped with the member to the jobsite. Prior to cutting holes on the job, proper protection for the hole must be provided to protect the workers. Perimeter guarding or covers will not be removed without the approval of the erection foreman.

Precast concrete column erection through the existing deck requires that many holes be provided through this deck. These are to be covered and protected. Except for the opening being currently used to erect a column, all opening protection is to be left undisturbed. The opening being uncovered to erect a column will become part of the

point of erection and will be addressed as part of this Fall Protection Plan. This uncovering is to be done at the erection foreman's direction and will only occur immediately prior to "feeding" the column through the opening. Once the end of the column is through the slab opening, there will no longer exist a fall hazard at this location.

### **III. IMPLEMENTATION OF FALL PROTECTION PLAN**

The structure being erected is a multi-story total precast concrete building consisting of columns, beams, wall panels and hollow core slabs and double tee floor and roof members.

The following is a list of the products and erection situations on this job:

#### **Columns**

For columns 10 ft to 36 ft long, employees disconnecting crane hooks from columns will work from a ladder and wear a body belt/harness with lanyard and be tied off when both hands are needed to disconnect. For tying off, a vertical lifeline will be connected to the lifting eye at the top of the column, prior to lifting, to be used with a manually operated or mobile rope grab. For columns too high for the use of a ladder, 36 ft and higher, an added cable will be used to reduce the height of the disconnecting point so that a ladder can be used. This cable will be left in place until a point in erection that it can be removed safely. In some cases, columns will be unhooked from the crane by using an erection tube or shackle with a pull pin which is released from the ground after the column is stabilized.

The column will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

#### **Inverted Tee Beams**

Employees erecting inverted tee beams, at a height of 6 to 40 ft, will erect the beam, make initial connections, and final alignment from a ladder. If the employee needs to reach over the side of the beam to bar or make an adjustment to the alignment of the beam, they will mount the beam and be tied off to the lifting device in the beam after ensuring the load has been stabilized on its bearing. To disconnect the crane from the beam an employee will stand a ladder against the beam. Because the use of ladders is not practical at heights above 40 ft, beams will be initially placed with use of tag lines and their final alignment made by a person on a manlift or similar employee positioning systems.

#### **Spandrel Beams**

Spandrel beams at the exterior of the building will be aligned as closely as possible with the use of tag lines with the final placement of the spandrel beam made from a ladder at the open end of the structure. A ladder will be used to make the initial connections and a ladder will be used to disconnect the crane. The other end of the beam will be placed by the designated erector from the double tee deck under the observation of the safety monitor.

The beams will be adequately connected and/or braced to safely support the weight of a ladder with an employee on it.

#### **Floor and Roof Members**

During installation of the precast concrete floor and/or roof members, the work deck continuously increases in area as more and more units are being erected and positioned. Thus, the unprotected floor/roof perimeter is constantly modified with the leading edge changing location as each member is installed. The fall protection for workers at the leading edge shall be assured by properly constructed and maintained control zone lines not more than 60 ft away from the leading edge supplemented by a safety monitoring system to ensure the safety of all designated erectors working within the area defined by the control zone lines.

The hollow core slabs erected on the masonry portion of the building will be erected and grouted using the safety monitoring system. Grout will be placed in the space between the end of the slab and face shell of the concrete masonry by dumping from a wheelbarrow. The grout in the keyways between the slabs will be dumped from a wheelbarrow and then spread with long handled tools, allowing the worker to stand erect facing toward the unprotected edge and back from any work deck edge.

Whenever possible, the designated erectors will approach the incoming member at the leading edge only after it is below waist height so that the member itself provides protection against falls.

Except for the situations described below, when the arriving floor or roof member is within 2 to 3 inches of its final position, the designated erectors can then proceed to their position of erection at each end of the member under the control of the safety monitor. Crane hooks will be unhooked from double tee members by designated erectors under the direction and supervision of the safety monitor.

Designated erectors, while waiting for the next floor or roof member, will be constantly under the control of the safety monitor for fall protection and are directed to stay a minimum of six (6) ft from the edge. In the event a designated erector must move from one end of a member, which has just been placed at the leading edge, they must first move away from the leading edge a minimum of six (6) ft and then progress to the other end while maintaining the minimum distance of six (6) ft at all times.

Erection of double tees, where conditions require bearing of one end into a closed pocket and the other end on a beam ledge, restricting the tee legs from going directly into the pockets, require special considerations. The tee legs that are to bear in the closed pocket must hang lower than those at the beam bearing. The double tee will be "two-lined" in order to elevate one end higher than the other to allow for the low end to be ducked into the closed pocket using the following procedure.

The double tee will be rigged with a standard four-way spreader off of the main load line. An additional choker will be attached to the married point of the two-legged spreader at the end of the tee that is to be elevated. The double tee will be hoisted with the main load line and swung into a position as close as possible to the tee's final bearing elevation. When the tee is in this position and stabilized, the whip line load block will be lowered to just above the tee deck. At this time, two erectors will walk out on the suspended tee deck at midspan of the tee member and pull the load block to the end of the tee to be elevated and attach the additional choker to the load block. The possibility of entanglement with the crane lines and other obstacles during this two lining process while raising and lowering the crane block on that second line could be hazardous to an encumbered employee. Therefore, the designated erectors will not tie off during any part of this process. While the designated erectors are on the double tee, the safety monitoring system will be used. After attaching the choker, the two erectors then step back on the previously erected tee deck and signal the crane operator to hoist the load with the whip line to

the elevation that will allow for enough clearance to let the low end tee legs slide into the pockets when the main load line is lowered. The erector, who is handling the lowered end of the tee at the closed pocket bearing, will step out on the suspended tee. An erection bar will then be placed between the end of the tee leg and the inside face of the pocketed spandrel member.

The tee is barred away from the pocketed member to reduce the friction and lateral force against the pocketed member. As the tee is being lowered, the other erector remains on the tee which was previously erected to handle the other end. At this point the tee is slowly lowered by the crane to a point where the tee legs can freely slide into the pockets. The erector working the lowered end of the tee must keep pressure on the bar between the tee and the face of the pocketed spandrel member to very gradually let the tee legs slide into the pocket to its proper bearing dimension. The tee is then slowly lowered into its final erected position.

The designated erector should be allowed onto the suspended double tee, otherwise there is no control over the horizontal movement of the double tee and this movement could knock the spandrel off of its bearing or the column out of plumb. The control necessary to prevent hitting the spandrel can only be done safely from the top of the double tee being erected.

**Loadbearing Wall Panels:** The erection of the loadbearing wall panels on the elevated decks requires the use of a safety monitor and a controlled access zone that is a minimum of 25 ft and a maximum of 1/2 the length of the wall panels away from the unprotected edge, so that designated erectors can move freely and unencumbered when receiving the panels. Bracing, if required for stability, will be installed by ladder. After the braces are secured, the crane will be disconnected from the wall by using a ladder. The wall to wall connections will also be performed from a ladder.

**Non-Loadbearing Panels (Cladding):** The locating of survey lines, panel layout and other installation prerequisites (prewelding, etc.) for non-loadbearing panels (cladding) will not commence until floor perimeter and floor openings have been protected. In some areas, it is necessary because of panel configuration to remove the perimeter protection as the cladding is being installed. Removal of perimeter protection will be performed on a bay to bay basis, just ahead of cladding erection to minimize temporarily unprotected floor edges. Those workers within 6 ft of the edge, receiving and positioning the cladding when the perimeter protection is removed shall be tied off.

### **Detailing**

Employees exposed to falls of six (6) feet or more to lower levels, who are not actively engaged in leading edge work or connecting activity, such as welding, bolting, cutting, bracing, guying, patching, painting or other operations, and who are working less than six (6) ft from an unprotected edge will be tied off at all times or guardrails will be installed. Employees engaged in these activities but who are more than six (6) ft from an unprotected edge as defined by the control zone lines, do not require fall protection but a warning line or control lines must be erected to remind employees they are approaching an area where fall protection is required.

## **IV. CONVENTIONAL FALL PROTECTION CONSIDERED FOR THE POINT OF ERECTION OR LEADING EDGE ERECTION OPERATIONS**

### **A. Personal Fall Arrest Systems**

In this particular erection sequence and procedure, personal fall arrest systems requiring body belt/harness systems, lifelines and lanyards will not reduce possible hazards to workers and will create offsetting hazards during their usage at the leading edge of precast/prestressed concrete construction.

Leading edge erection and initial connections are conducted by employees who are specifically trained to do this type of work and are trained to recognize the fall hazards. The nature of such work normally exposes the employee to the fall hazard for a short period of time and installation of fall protection systems for a short duration is not feasible because it exposes the installers of the system to the same fall hazard, but for a longer period of time.

1. It is necessary that the employee be able to move freely without encumbrance in order to guide the sections of precast concrete into their final position without having lifelines attached which will restrict the employee's ability to move about at the point of erection.
2. A typical procedure requires 2 or more workers to maneuver around each other as a concrete member is positioned to fit into the structure. If they are each attached to a lifeline, part of their attention must be diverted from their main task of positioning a member weighing several tons to the task of avoiding entanglements of their lifelines or avoiding tripping over lanyards. Therefore, if these workers are attached to lanyards, more fall potential would result than from not using such a device.

In this specific erection sequence and procedure, retractable lifelines do not solve the problem of two workers becoming tangled. In fact, such a tangle could prevent the lifeline from retracting as the worker moved, thus potentially exposing the worker to a fall greater than 6 ft. Also, a worker crossing over the lifeline of another worker can create a hazard because the movement of one person can unbalance the other. In the event of a fall by one person there is a likelihood that the other person will be caused to fall as well. In addition, if contamination such as grout (during hollow core grouting) enters the retractable housing it can cause excessive wear and damage to the device and could clog the retracting mechanism as the lanyard is dragged across the deck. Obstructing the cable orifice can defeat the device's shock absorbing function, produce cable slack and damage, and adversely affect cable extraction and retraction.

3. Employees tied to a lifeline can be trapped and crushed by moving structural members if the employee becomes restrained by the lanyard or retractable lifeline and cannot get out of the path of the moving load. The sudden movement of a precast concrete member being raised by a crane can be caused by a number of factors. When this happens, a connector may immediately have to move a considerable distance to avoid injury. If a tied off body belt/harness is being used, the connector could be trapped. Therefore, there is a greater risk of injury if the connector is tied to the structure for this specific erection sequence and procedure.

When necessary to move away from a retractable device, the worker cannot move at a rate greater than the device locking speed typically 3.5 to 4.5 ft/sec. When moving toward the device it is necessary to move at a rate which does not permit cable slack to build up. This slack may cause cable retraction acceleration and cause a worker to lose their balance by applying a higher than normal jerking force on the body when the cable suddenly becomes taut after building up momentum. This slack can also cause damage

to the internal spring-loaded drum, uneven coiling of cable on the drum, and possible cable damage.

The factors causing sudden movements for this location include:

(a) Cranes

- (1) Operator error.
- (2) Site conditions (soft or unstable ground).
- (3) Mechanical failure.
- (4) Structural failure.
- (5) Rigging failure.
- (6) Crane signal/radio communication failure.

(b) Weather Conditions

- (1) Wind (strong wind/sudden gusting) - particularly a problem with the large surface areas of precast concrete members.
- (2) Snow/rain (visibility).
- (3) Fog (visibility).
- (4) Cold - causing slowed reactions or mechanical problems.

- (c) Structure/Product Conditions.
    - (1) Lifting Eye failure.
    - (2) Bearing failure or slippage.
    - (3) Structure shifting.
    - (4) Bracing failure.
    - (5) Product failure.
  - (d) Human Error.
    - (1) Incorrect tag line procedure.
    - (2) Tag line hang-up.
    - (3) Incorrect or misunderstood crane signals.
    - (4) Misjudged elevation of member.
    - (5) Misjudged speed of member.
    - (6) Misjudged angle of member.
4. Anchorages or special attachment points could be cast into the precast concrete members if sufficient preplanning and consideration of erectors' position is done before the members are cast. Any hole or other attachment must be approved by the engineer who designed the member. It is possible that some design restrictions will not allow a member to be weakened by an additional hole; however, it is anticipated that such situations would be the exception, not the rule. Attachment points, other than on the deck surface, will require removal and/or patching. In order to remove and/or patch these points, requires the employee to be exposed to an additional fall hazard at an unprotected perimeter. The fact that attachment points could be available anywhere on the structure does not eliminate the hazards of using these points for tying off as discussed above. A logical point for tying off on double tees would be using the lifting loops, except that they must be cut off to eliminate a tripping hazard at an appropriate time.
5. Providing attachment at a point above the walking/working surface would also create fall exposures for employees installing their devices. Final positioning of a precast concrete member requires it to be moved in such a way that it must pass through the area that would be occupied by the lifeline and the lanyards attached to the point above. Resulting entanglements of lifelines and lanyards on a moving member could pull employees from the work surface. Also, the structure is being created and, in most cases, there is no structure above the members being placed.
- (a) Temporary structural supports, installed to provide attaching points for lifelines limit the space which is essential for orderly positioning, alignment and placement of the precast concrete members. To keep the lanyards a reasonable and manageable length, lifeline supports would necessarily need to be in proximity to the positioning process. A sudden shift of the precast concrete member being positioned because

of wind pressure or crane movement could make it strike the temporary supporting structure, moving it suddenly and causing tied off employees to fall.

- (b) The time in manhours which would be expended in placing and maintaining temporary structural supports for lifeline attaching points could exceed the expended manhours involved in placing the precast concrete members. No protection could be provided for the employees erecting the temporary structural supports and these supports would have to be moved for each successive step in the construction process, thus greatly increasing the employee's exposure to the fall hazard.
- (c) The use of a cable strung horizontally between two columns to provide tie off lines for erecting or walking a beam for connecting work is not feasible and creates a greater hazard on this multi-story building for the following reasons:
  - (1) If a connector is to use such a line, it must be installed between the two columns. To perform this installation requires an erector to have more fall exposure time attaching the cable to the columns than would be spent to make the beam to column connection itself.
  - (2) If such a line is to be installed so that an erector can walk along a beam, it must be overhead or below him. For example, if a connector must walk along a 24 in. wide beam, the presence of a line next to the connector at waist level, attached directly to the columns, would prevent the connector from centering their weight over the beam and balancing themselves. Installing the line above the connector might be possible on the first level of a two-story column; however, the column may extend only a few feet above the floor level at the second level or be flush with the floor level.

Attaching the line to the side of the beam could be a solution; however, it would require the connector to attach the lanyard below foot level which would most likely extend a fall farther than 6 ft.

- (3) When lines are strung over every beam, it becomes more and more difficult for the crane operator to lower a precast concrete member into position without the member becoming fouled. Should the member become entangled, it could easily dislodge the line from a column. If a worker is tied to it at the time, a fall could be caused.
6. The ANSI A10.14-1991 American National Standard for Construction and Demolition Operations - Requirements for Safety Belts, Harnesses, Lanyards and Lifelines for Construction and Demolition Use, states that the anchor point of a lanyard or deceleration device should, if possible, be located above the wearer's belt or harness attachment. ANSI A10.14 also states that a suitable anchorage point is one which is located as high as possible to prevent contact with an obstruction below should the worker fall. Most manufacturers also warn in the user's handbook that the safety block/retractable lifeline must be positioned above the D-ring (above the work space of the intended user) and OSHA recommends that fall arrest and restraint equipment be used in accordance with the manufacturer's instructions.

Attachment of a retractable device to a horizontal cable near floor level or using the inserts in the floor or roof members may result in increased free fall due to the dorsal D-ring of the full-body harness riding higher than the attachment point of the snaphook to the cable or insert (e.g., 6 foot tall worker with a dorsal D-ring at 5 feet above the floor or surface, reduces the working length to only one foot, by placing the anchorage five feet away from the fall hazard). In addition, impact loads may exceed maximum fall arrest forces (MAF) because the fall arrest D-ring would be 4 to 5 feet higher than the safety block/retractable lifeline anchored to the walking-working surface; and the potential for swing hazards is increased. Manufacturers also require that workers not work at a level where the point of snaphook attachment to the body harness is above the device because this will increase the free fall distance and the deceleration distance and will cause higher forces on the body in the event of an accidental fall.

Manufacturers recommend an anchorage for the retractable lifeline which is immovably fixed in space and is independent of the user's support systems. A moveable anchorage is one which can be moved around (such as equipment or wheeled vehicles) or which can deflect substantially under shock loading (such as a horizontal cable or very flexible beam). In the case of a very flexible anchorage, a shock load applied to the anchorage during fall arrest can cause oscillation of the flexible anchorage such that the retractable brake mechanism may undergo one or more cycles of locking/unlocking/locking (ratchet effect) until the anchorage deflection is dampened. Therefore, use of a moveable anchorage involves critical engineering and safety factors and should only be considered after fixed anchorage has been determined to be not feasible.

Horizontal cables used as an anchorage present an additional hazard due to amplification of the horizontal component of maximum arrest force (of a fall) transmitted to the points where the horizontal cable is attached to the structure. This amplification is due to the angle of sag of a horizontal cable

and is most severe for small angles of sag. For a cable sag angle of 2 degrees the horizontal force on the points of cable attachment can be amplified by a factor of 15.

It is also necessary to install the retractable device vertically overhead to minimize swing falls. If an object is in the worker's swing path (or that of the cable) hazardous situations exist: (1) due to the swing, horizontal speed of the user may be high enough to cause injury when an obstacle in the swing fall path is struck by either the user or the cable; (2) the total vertical fall distance of the user may be much greater than if the user had fallen only vertically without a swing fall path.

With retractable lines, overconfidence may cause the worker to engage in inappropriate behavior, such as approaching the perimeter of a floor or roof at a distance appreciably greater than the shortest distance between the anchorage point and the leading edge. Though the retractable lifeline may arrest a worker's fall before he or she has fallen a few feet, the lifeline may drag along the edge of the floor or beam and swing the worker like a pendulum until the line has moved to a position where the distance between the anchorage point and floor edge is the shortest distance between those two points. Accompanying this pendulum swing is a lowering of the worker, with the attendant danger that he or she may violently impact the floor or some obstruction below.

The risk of a cable breaking is increased if a lifeline is dragged sideways across the rough surface or edge of a concrete member at the same moment that the lifeline is being subjected to a maximum impact loading during a fall. The typical 3/16 in. cable in a retractable lifeline has a breaking strength of from 3000 to 3700 lbs.

7. The competent person, who can take into account the specialized operations being performed on this project, should determine when and where a designated erector cannot use a personal fall arrest system.

## **B. Safety Net Systems**

The nature of this particular precast concrete erection worksite precludes the safe use of safety nets where point of erection or leading edge work must take place.

1. To install safety nets in the interior high bay of the single story portion of the building poses rigging attachment problems. Structural members do not exist to which supporting devices for nets can be attached in the area where protection is required. As the erection operation advances, the location of point of erection or leading edge work changes constantly as each member is attached to the structure. Due to this constant change it is not feasible to set net sections and build separate structures to support the nets.
2. The nature of the erection process for the precast concrete members is such that an installed net would protect workers as they position and secure only one structural member. After each member is stabilized the net would have to be moved to a new location (this could mean a move of 8 to 10 ft or the possibility of a move to a different level or area of the structure) to protect workers placing the next piece in the construction sequence. The result would be the installation and dismantling of safety nets repeatedly throughout the normal work day. As the time necessary to install a net, test, and remove it is significantly greater than the time necessary to position and secure a precast

concrete member, the exposure time for the worker installing the safety net would be far longer than for the workers whom the net is intended to protect. The time exposure repeats itself each time the nets and supporting hardware must be moved laterally or upward to provide protection at the point of erection or leading edge.

3. Strict interpretation of 1926.502(c) requires that operations shall not be undertaken until the net is in place and has been tested. With the point of erection constantly changing, the time necessary to install and test a safety net significantly exceeds the time necessary to position and secure the concrete member.
4. Use of safety nets on exposed perimeter wall openings and opensided floors, causes attachment points to be left in architectural concrete which must be patched and filled with matching material after the net supporting hardware is removed. In order to patch these openings, additional numbers of employees must be suspended by swing stages, boatswain chairs or other devices, thereby increasing the amount of fall exposure time to employees.
5. Installed safety nets pose an additional hazard at the perimeter of the erected structure where limited space is available in which members can be turned after being lifted from the ground by the crane. There would be a high probability that the member being lifted could become entangled in net hardware, cables, etc.
6. The use of safety nets where structural wall panels are being erected would prevent movement of panels to point of installation. To be effective, nets would necessarily have to provide protection across the area where structural supporting wall panels would be set and plumbed before roof units could be placed.
7. Use of a tower crane for the erection of the high rise portion of the structure poses a particular hazard in that the crane operator cannot see or judge the proximity of the load in relation to the structure or nets. If the signaler is looking through nets and supporting structural devices while giving instructions to the crane operator, it is not possible to judge precise relationships between the load and the structure itself or to nets and supporting structural devices. This could cause the load to become entangled in the net or hit the structure causing potential damage.

### **C. Guardrail Systems**

On this particular worksite, guardrails, barricades, ropes, cables or other perimeter guarding devices or methods on the erection floor will pose problems to safe erection procedures. Typically, a floor or roof is erected by placing 4 to 10 ft wide structural members next to one another and welding or grouting them together. The perimeter of a floor and roof changes each time a new member is placed into position. It is unreasonable and virtually impossible to erect guardrails and toe boards at the ever changing leading edge of a floor or roof.

1. To position a member safely it is necessary to remove all obstructions extending above the floor level near the point of erection. Such a procedure allows workers to swing a new member across the erected surface as necessary to position it properly without worrying about knocking material off of this surface.

Hollow core slab erection on the masonry wall requires installation of the perimeter protection where the masonry wall has to be constructed. This means the guardrail is installed then subsequently removed to continue the masonry construction. The erector will be exposed to a fall hazard for a longer period of time while installing and removing perimeter protection than while erecting the slabs.

In hollow core work, as in other precast concrete erection, others are not typically on the work deck until the precast concrete erection is complete. The deck is not complete until the leveling, aligning, and grouting of the joints is done. It is normal practice to keep others off the deck until at least the next day after the installation is complete to allow the grout to harden.

2. There is no permanent boundary until all structural members have been placed in the floor or roof. At the leading edge, workers are operating at the temporary edge of the structure as they work to position the next member in the sequence. Compliance with the standard would require a guardrail and toe board be installed along this edge. However, the presence of such a device would prevent a new member from being swung over the erected surface low enough to allow workers to control it safely during the positioning process. Further, these employees would have to work through the guardrail to align the new member and connect it to the structure. The guardrail would not protect an employee who must lean through it to do the necessary work, rather it would hinder the employee to such a degree that a greater hazard is created than if the guardrail were absent.
3. Guardrail requirements pose a hazard at the leading edge of installed floor or roof sections by creating the possibility of employees being caught between guardrails and suspended loads. The lack of a clear work area in which to guide the suspended load into position for placement and welding of members into the existing structure creates still further hazards.
4. Where erection processes require precast concrete stairways or openings to be installed as an integral part of the overall erection process, it must also be recognized that guardrails or handrails must not project above the surface of the erection floor. Such guardrails should be terminated at the level of the erection floor to avoid placing hazardous obstacles in the path of a member being positioned.

## **V. OTHER FALL PROTECTION MEASURES CONSIDERED FOR THIS JOB**

The following is a list and explanation of other fall protection measures available and an explanation of limitations for use on this particular jobsite. If during the course of erecting the building the employee sees an area that could be erected more safely by the use of these fall protection measures, the foreman should be notified.

### **A. Scaffolds are not used because:**

1. The leading edge of the building is constantly changing and the scaffolding would have to be moved at very frequent intervals. Employees erecting and dismantling the scaffolding would be exposed to fall hazards for a greater length of time than they would by merely erecting the precast concrete member.
2. A scaffold tower could interfere with the safe swinging of a load by the crane.

3. Power lines, terrain and site do not allow for the safe use of scaffolding.
- B. Vehicle mounted platforms are not used because:
1. A vehicle mounted platform will not reach areas on the deck that are erected over other levels.
  2. The leading edge of the building is usually over a lower level of the building and this lower level will not support the weight of a vehicle mounted platform.
  3. A vehicle mounted platform could interfere with the safe swinging of a load by the crane, either by the crane swinging the load over or into the equipment.
  4. Power lines and surrounding site work do not allow for the safe use of a vehicle mounted platform.
- C. Crane suspended personnel platforms are not used because:
1. A second crane close enough to suspend any employee in the working and erecting area could interfere with the safe swinging of a load by the crane hoisting the product to be erected.
  2. Power lines and surrounding site work do not allow for the safe use of a second crane on the job.

## **VI. ENFORCEMENT**

Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The jobsite Superintendent, as well as individuals in the Safety and Personnel Department, reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

## **VII. ACCIDENT INVESTIGATIONS**

All accidents that result in injury to workers, regardless of their nature, shall be investigated and reported. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a reoccurrence.

In the event that an employee falls or there is some other related, serious incident occurring, this plan shall be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.

## **VIII. CHANGES TO PLAN**

Any changes to the plan will be approved by (name of the qualified person). This plan shall be reviewed by a qualified person as the job progresses to determine if additional practices, procedures or training needs to be implemented by the competent person to improve or provide additional fall protection. Workers shall be notified and trained, if necessary, in the new procedures. A copy of this plan and all approved changes shall be maintained at the jobsite.

# Respiratory Protection

## For CCG

### 1.0 Purpose

CCG has determined that employees performing Sanding and painting operations and any act otherwise not mentioned that which creates dust and airborne particles are exposed to respiratory hazards during routine operations. These hazards include wood dust, particulates, and vapors, and in some cases represent Immediately Dangerous to Life or Health (IDLH) conditions. The purpose of this program is to ensure that all company employees are protected from exposure to these respiratory hazards.

Engineering controls, such as ventilation and substitution of less toxic materials, are the first line of defense CCG; however, engineering controls have not always been feasible for some of our operations, or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also needed to protect employees' health during emergencies. The work processes requiring respirator use at CCG are outlined in Table 1 in the Scope and Application section of this program. In addition, some employees have expressed a desire to wear respirators during certain operations that do not require respiratory protection. As a general policy CCG will review each of these requests on a case-by-case basis. If the use of respiratory protection in a specific case will not jeopardize the health or safety of the worker(s) CCG will provide respirators for voluntary use. As outlined in the Scope and Application section of this program, voluntary respirator use is subject to certain requirements of this program.

### 2.0 Scope and Application

This program applies to all employees who are required to wear respirators during normal work operations, and during some non-routine or emergency operations such as a spill of a hazardous substance. This includes all employees performing sanding and painting operation and any act otherwise not mentioned that which creates dust and airborne particles are exposed to respiratory hazards during routine operations. All employees working in these areas and engaged in certain processes or tasks (as outlined in the table below) must be enrolled in the company's respiratory protection program.

In addition, any employee who voluntarily wears a respirator when a respirator is not required (i.e., in certain maintenance and coating operations) is subject to the medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program. Employees who voluntarily wear filtering facepieces (dust masks) are not subject to the medical evaluation, cleaning, storage, and maintenance provisions of this program.

Employees participating in the respiratory protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be borne by the company.

TABLE 1: VOLUNTARY AND REQUIRED RESPIRATOR USE AT CCG	
<b>Respirator</b>	<b>Department/Process</b>
Filtering facepiece (dust mask)	Voluntary use
Half-facepiece APR or PAPR with P100 filter	Prep and Assembly Voluntary when cleaning spray booth walls or changing spray booth filter
SAR, pressure demand, with auxiliary SCBA	Maintenance - dip coat tank cleaning
Continuous flow SAR with hood	Spray booth operations Prep*
Half-facepiece APR with organic vapor cartridge	Voluntary use for Dip Coat Tenders, Spray Booth Operators and loading coating agents into supply systems
Escape SCBA	Dip Coat, Coatings Storage Area, Spray Booth Area

\* until ventilation is installed.

### **3.1 Responsibilities**

#### **A. Program Administrator**

The Program Administrator is responsible for administering the respiratory protection program. Duties of the program administrator include:

- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards.
- Selection of respiratory protection options.
- Monitoring respirator use to ensure that respirators are used in accordance with their certifications.
- Arranging for and/or conducting training.
- Ensuring proper storage and maintenance of respiratory protection equipment.
- Conducting qualitative fit testing with Bitrex.
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating the program.
- Updating written program, as needed.

The Program Administrator for CCG is the Project Manager in charge.

#### **B. Supervisors**

Supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties of the supervisor include:

- a. Ensuring that employees under their supervision (including new hires) have received appropriate training, fit testing, and initial medical evaluation.
- b. Ensuring the availability of appropriate respirators and accessories.
- c. Being aware of tasks requiring the use of respiratory protection.
- d. Enforcing the proper use of respiratory protection when necessary.
- e. Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan.
- f. Ensuring that respirators fit well and do not cause discomfort.
- g. Continually monitoring work areas and operations to identify respiratory hazards.

- h. Coordinating with the Program Administrator on how to address respiratory hazards or other concerns regarding the program.

### **C. Employees**

Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Employees must also:

- Care for and maintain their respirators as instructed, and store them in a clean sanitary location.
- Inform their supervisor if the respirator no longer fits well, and request a new one that fits properly.
- Inform their supervisor or the Program Administrator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.

## **4.1 Program Elements**

### **A. Selection Procedures**

The Program Administrator will select respirators to be used on site, based on the hazards to which workers are exposed and in accordance with all OSHA standards. The Program Administrator will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency. The hazard evaluation will include:

1. Identification and development of a list of hazardous substances used in the workplace, by department, or work process.
2. Review of work processes to determine where potential exposures to these hazardous substances may occur. This review shall be conducted by surveying the workplace, reviewing process records, and talking with employees and supervisors.
3. Exposure monitoring to quantify potential hazardous exposures. Monitoring will be contracted out. CCG currently has a contract with ABC Industrial Hygiene Services to provide monitoring when needed.

The results of the current hazard evaluation are the following: (Table 3 at the end of this program contains the sampling data that this section was based on.)

**THIS IS ONLY AN EXAMPLE:**

**Prep-sanding:** Ventilation controls on some sanders are in place, but employees continue to be exposed to respirable wood dust at 2.5 - 7.0 mg/m<sup>3</sup> (8 hour time-weighted-average, or TWA). Half-facepiece APRs with P100 filters and goggles are required for employees sanding wood pieces. PAPRs will be available for employees who are unable to wear an APR.

**Prep-cleaning:** Average methylene chloride exposures measured at 70 ppm based on 8 hr. TWA exposure results for workers cleaning/stripping furniture pieces. Ventilation controls are planned, but will not be implemented until designs are completed and a contract has been let for installation of the controls. In the meantime, employees must wear supplied air hoods with continuous air flow, as required by the Methylene Chloride standard 1910.1052.

**Assembly:** Ventilation controls on sanders are in place, but employees continue to be exposed to respirable wood dust at 2.5 - 6.0 mg/m<sup>3</sup> (8 hour TWA); half-facepiece APRs with P100 filters and goggles are required for employees sanding wood pieces in the assembly department. PAPRs will be available for employees who are unable to wear an APR. The substitution for aqueous-based glues will eliminate exposures to formaldehyde, methylene chloride, and epoxy resins.

**Maintenance:** Because of potential IDLH conditions, employees cleaning dip coat tanks must wear a pressure demand SAR during the performance of this task.

Employees may voluntarily wear half-facepiece APRs with P100 cartridges when cleaning spray booth walls or changing booth filters and half-facepiece APRs with organic vapor cartridges when loading coating agents into supply systems. Although exposure monitoring has shown that exposures are kept within PELs during these procedures, **CCG** will provide respirators to workers who are concerned about potential exposures.

## **B. Updating the Hazard Assessment**

The Program Administrator must revise and update the hazard assessment as needed (i.e., any time work process changes may potentially affect exposure). If an employee feels that respiratory protection is needed during a particular activity, he/she is to contact his or her supervisor or the Program Administrator. The Program Administrator will evaluate the potential hazard, arranging for outside assistance as necessary. The Program Administrator will then communicate the results of that assessment back to the employees. If it is determined that respiratory protection is necessary, all other elements of this program will be in effect for those tasks and this program will be updated accordingly.

## **C. NIOSH Certification**

All respirators must be certified by the National Institute for Occupational Safety and Health (NIOSH) and shall be used in accordance with the terms of that certification. Also, all filters, cartridges, and canisters must be labeled with the appropriate NIOSH approval label. The label must not be removed or defaced while it is in use.

#### **D. Voluntary Respirator Use**

**CCG** will provide respirators at no charge to employees for voluntary use for the following work processes:

- Employees may wear half-facepiece APRs with organic vapor cartridges while working in the dip coat area.
- Warehouse workers may wear filtering facepieces.
- Spray Booth Operators may wear half-facepiece APRs with organic vapor cartridges while cleaning spray guns.
- Maintenance personnel may wear half-facepiece APRs with P100 cartridges while cleaning spray booth walls, and organic vapor cartridges while loading spray guns.

The Program Administrator will provide all employees who voluntarily choose to wear either of the above respirators with a copy of Appendix D of the standard. (Appendix D details the requirements for voluntary use of respirators by employees.) Employees choosing to wear a half facepiece APR must comply with the procedures for Medical Evaluation, Respirator Use, and Cleaning, Maintenance and Storage.

The Program Administrator shall authorize voluntary use of respiratory protective equipment as requested by all other workers on a case-by-case basis, depending on specific workplace conditions and the results of the medical evaluations.

#### **E. Medical Evaluation**

1. Employees who are either required to wear respirators, or who choose to wear an APR voluntarily, must pass a medical exam before being permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a physician has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use.
2. A licensed physician at where all company medical services are provided, will provide the medical evaluations. Medical evaluation procedures are as follows:
  - The medical evaluation will be conducted using the questionnaire provided in Appendix C of the respiratory protection standard. The Program Administrator will provide a copy of this questionnaire to all employees requiring medical evaluations.
  - To the extent feasible, the company will assist employees who are unable to read the questionnaire (by providing help in reading the

questionnaire). When this is not possible, the employee will be sent directly to the physician for medical evaluation.

- All affected employees will be given a copy of the medical questionnaire to fill out, along with a stamped and addressed envelope for mailing the questionnaire to the company physician. Employees will be permitted to fill out the questionnaire on company time.
  - Follow-up medical exams will be granted to employees as required by the standard, and/or as deemed necessary by the ABC medical clinic physician.
  - All employees will be granted the opportunity to speak with the physician about their medical evaluation, if they so request.
  - The Program Administrator has provided the ABC medical clinic physician with a copy of this program, a copy of the Respiratory Protection standard, the list of hazardous substances by work area, and for each employee requiring evaluation: his or her work area or job title, proposed respirator type and weight, length of time required to wear respirator, expected physical work load (light, moderate, or heavy), potential temperature and humidity extremes, and any additional protective clothing required.
  - Any employee required for medical reasons to wear a positive pressure air purifying respirator will be provided with a powered air purifying respirator.
  - After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided under the following circumstances:
    - \* Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.
    - \* The ABC medical clinic physician or supervisor informs the Program Administrator that the employee needs to be reevaluated;
    - \* Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation;
    - \* A change occurs in workplace conditions that may result in an increased physiological burden on the employee.
3. A list of CCG employees currently included in medical surveillance is provided in Table 2 of this program.
  4. All examinations and questionnaires are to remain confidential between the employee and the physician.

#### **F. Fit Testing**

1. Fit testing is required for employees wearing half-facepiece APRs for exposure to wood dust in Prep and Assembly, and maintenance workers who wear a tight-fitting SAR for dip tank cleaning. Employees voluntarily wearing half-facepiece APRs may also be fit tested upon request.
2. Employees who are required to wear half-facepiece APRs will be fit tested:

- Prior to being allowed to wear any respirator with a tight fitting facepiece.
  - Annually.
  - When there are changes in the employee' s physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.).
3. Employees will be fit tested with the make, model, and size of respirator that they will actually wear. Employees will be provided with several models and sizes of respirators so that they may find an optimal fit. Fit testing of PAPRs is to be conducted in the negative pressure mode.
  4. The Program Administrator will conduct fit tests following the OSHA approved Bitrex Solution Aerosol QLFT Protocol in Appendix B (B4) of the Respiratory Protection standard.
  5. The Program Administrator has determined that QNFT is not required for the respirators used under current conditions at CCG. If conditions affecting respirator use change, the Program Administrator will evaluate on a case-by-case basis whether QNFT is required.



# Confined Space Safety Program

## For CCG

### 1. BACKGROUND

A confined space is defined as any location that has limited openings for entry and egress, is not intended for continuous employee occupancy, and is so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV). Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, and bins. Entry into confined spaces without the proper precautions could result in injury and/or impairment or death due to:

- \* An atmosphere that is flammable or explosive,
- \* Lack of sufficient oxygen to support life,
- \* Contact with or inhalation of toxic materials, or
- \* General safety or work area hazards such as steam or high pressure materials.

The overall objectives of this procedure are to provide the minimum safety requirements to be followed while entering, exiting and working in confined spaces during environmental restoration work. This chapter provides pertinent details on the following:

- \* Duties and responsibilities,
- \* Identification and evaluation,
- \* Hazard assessment,
- \* Hazard controls,
- \* Entry permits,
- \* Entry procedures,
- \* Opening a confined space,
- \* Atmospheric testing,
- \* Isolation and lockout/tagout safeguards,
- \* Ingress/egress safeguards,
- \* Warning signs and symbols,
- \* Training, and
- \* Emergency response

## 2. DUTIES AND RESPONSIBILITIES

1. Project Manager, Competent Person, and Lead Personnel are responsible for implementing the confined space program in accordance with this procedure.
2. Project Manager, Competent Person, and Lead Personnel are responsible for implementing the confined space program and:
  - \* Ensuring that a list of confined spaces is maintained,
  - \* Ensuring that cancelled permits are reviewed for lessons learned,
  - \* Ensuring training of personnel is conducted,
  - \* Ensuring coordination with outside responders,
  - \* Ensuring equipment is in compliance with standards, and
  - \* Maintaining a master inventory of identified confined spaces.
3. Project Manager, Competent Person, and Lead Personnel are in charge of any confined space work and:
  - \* Ensuring requirements for entry have been completed before entry is authorized;
  - \* Ensuring confined space monitoring is performed by personnel qualified and trained in confined space entry procedures;
  - \* Ensuring a list of monitoring equipment and personnel qualified to operate the equipment is maintained by the Safety and Occupational Health Office;
  - \* Ensuring that the rescue team has simulated a rescue in a confined space within the past twelve months;
  - \* Knowing the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of exposure;
  - \* Filling out a permit;
  - \* Determining the entry requirements;
  - \* Requiring a permit review and signature from the authorized entry supervisor;
  - \* Notifying all involved employees of the permit requirements;
  - \* Posting the permit in a conspicuous location near the job;
  - \* Renewing the permit or have it reissued as needed (a new permit is required every shift);
  - \* Determining the number of attendants required to perform the work;
  - \* Ensuring the attendant knows how to communicate with the entrants and how to obtain assistance;
  - \* Posting any required barriers and signs;
  - \* Remaining alert to changing conditions that might affect the conditions of the permits, (i.e., require additional atmospheric monitoring or changes in personal protective equipment);
  - \* Changing and reissuing the permit, or issue a new permit as necessary;
  - \* Ensuring periodic atmospheric monitoring is done according to permit requirements;
  - \* Ensuring that personnel doing the work and all support personnel adhere to permit requirements;
  - \* Ensuring the permit is canceled when the work is done; and
  - \* Ensuring the confined space is safely closed and all workers are cleared from the area.

#### 4. Entry Supervisors

An Entry Supervisor is a qualified person authorized to approve confined space entry permits and is responsible for:

- \* Determining if conditions are acceptable for entry,
- \* Authorizing entry and overseeing entry operations,
- \* Terminating entry procedures as required,
- \* Serving as an attendant, as long as the person is trained and equipped appropriately for that role,
- \* Ensuring measures are in place to keep unauthorized personnel clear of the area,
- \* Checking the work at least twice a shift to verify and document permit requirements are being observed (more frequent checks should be made if operations or conditions are anticipated that could affect permit requirements),
- \* Ensuring that necessary information on chemical hazards is kept at the work site for the employees or rescue team,
- \* Ensuring a rescue team is available and instructed in their rescue duties (e.g., an onsite team or a prearranged outside rescue service), and
- \* Ensuring at least one member of the rescue team has current certification in first aid and CPR.

#### 5. Employees Entering Confined Space (Entrants)

Employees who are granted permission to enter a confined space are responsible for:

- \* Reading and observing the entry permit requirements;
- \* Staying alert to the hazards that could be encountered in a confined space;
- \* Using the protective equipment required by the permit;
- \* Immediately exit the confined space when:
  - Ordered to do so by the attendant,
  - Automatic alarms sound,
  - They perceive they are in danger, or
  - They notice physiological stresses or changes in themselves or co-workers (e.g., dizziness, blurred vision, shortness of breath).

## 6. Attendant

The Attendant should be stationed outside the work space and should:

- \* Be knowledgeable of, and be able to recognize potential confined space hazards;
- \* Maintain a sign-in/sign-out log with a count of all persons in the confined space and ensure all entrants sign in/sign-out;
- \* Monitor surrounding activities to ensure the safety of personnel;
- \* Maintain effective and continuous communication with personnel during confined space entry, work and exit;
- \* Order personnel to evacuate the confined space if he/she:
  - Observes a condition which is not allowed on the entry permit;
  - Notices the entrants acting strangely, possibly as a result of exposure to hazardous substances;
  - Notices a situation outside the confined space which could endanger personnel;
  - Notices within the confined space a hazard which has not been previously recognized or taken into consideration;
  - Must leave his/her work station; or
  - Must focus attention on the rescue of personnel in some other confined space that he/she is monitoring;
- \* Immediately summon the Rescue Team if crew rescue becomes necessary; and
- \* Keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of the unauthorized entry.

## 7. Rescue Team

The Rescue Team members should:

- \* Complete a training drill using mannequins or personnel in a simulation of the confined space prior to the issuance of an entry permit for any confined space and at least annually thereafter;
- \* Respond immediately to rescue calls from the Attendant or any other person recognizing a need for rescue from the confined space;
- \* In addition to emergency response training, receive the same training as that required of the authorized entrants; and
- \* Have current certification in first-aid and CPR.

### **3. Identification and Evaluation**

The Project Manager should ensure a survey is conducted of the work site to identify confined spaces. This survey can be partially completed from initial and continuing site characterizations, as well as other available data (e.g. blueprints, job safety analysis). The purpose of the survey is to develop an inventory of those locations and/or equipment that meet the definition of a confined space. This information should be communicated to personnel and appropriate procedures developed prior to entry. The initial surveys should include air monitoring to determine the air quality in the confined spaces. The following situations should be evaluated by competent personnel:

- \* Flammable or explosive potential,
- \* Oxygen deficiency, and
- \* Presence of toxic and corrosive material.

#### **1. Hazard Re-Evaluation**

The Project Manager should ensure the identification and re-evaluation of the hazards based on possible changes in activities, and/or other physical or environmental conditions, which could adversely affect work. A master inventory of confined spaces should be maintained. Any change in designation of a confined space will be routed through the Site Safety and Health Officer (SSHO) for review, prior to the change being made.

### **4. Hazard Assessment**

A hazard assessment should be completed prior to any entry into a confined space. The hazard assessment should identify the sequence of work to be performed in the confined space, the specific hazards known or anticipated, and the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level. No entry should be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who enter confined spaces should be informed of known or potential hazards associated with the confined spaces to be entered.

### **5. Hazard Controls**

Hazard controls include changes in the work processes and/or working environment with the objective of:

- \* Controlling the health hazards either by eliminating the responsible agents,
- \* Reducing health hazards below harmful levels, and
- \* Preventing the contaminants from coming into contact with the workers.

The following order of precedence should be followed in reducing confined space risks:

- \* Engineering controls, such as ventilation to limit exposure to hazards;
- \* Work practice controls, such as wetting of hazardous dusts, frequent cleaning; and
- \* Use of PPE, such as air purifying or supplied-air respirators.

#### 1. Engineering Controls

Engineering controls are those controls which eliminate or reduce the hazard through implementation of sound engineering practices.

Ventilation is one of the most common engineering controls used in confined spaces. When ventilation is used to remove atmospheric contaminants from the confined space, the space should be ventilated until the atmosphere is within the acceptable ranges. Ventilation should be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible, alternate protective measures or methods to remove air contaminants and protect occupants should be determined by the qualified person prior to authorizing entry. Conditions regarding continuous forced air ventilation should be used as follows:

- \* Employees should not enter the space until the forced air ventilation has eliminated any hazardous atmosphere,
- \* Forced air ventilation should be so directed as to ventilate the immediate areas where an employee is or will be present within the space,
- \* Continuous ventilation is maintained until all employees have left the space, and
- \* Air supply for forced air ventilation should be from a clean source.

#### 2. Work Practice (Administrative) Controls

Work practice (administrative) controls are those controls which eliminate or reduce the hazard through changes in the work practice (e.g., rotating workers, reducing the amount of worker exposure, housekeeping). Confined spaces should be cleaned/decontaminated of hazardous materials to the extent feasible before entry. Cleaning/decontamination should be the preferred method of reducing exposure to hazardous materials. Where this is not practicable, PPE should be worn by the entry personnel to provide appropriate protection against the hazards which may be present.

### 3. Personal Protective Equipment (PPE)

If the hazard cannot be eliminated or reduced to a safe level through engineering and/or work practice controls, PPE should be used. A qualified person should determine PPE needed by all personnel entering the confined space, including rescue teams. PPE which meet the specifications of applicable standards should be selected in accordance with the requirements of the job to be performed.

## 6. Entry Permits

The Confined Space Entry Permit is the major tool in assuring safety during entry in confined spaces with known hazards or with unknown or potentially hazardous atmospheres. The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit should be used to establish appropriate conditions. Before each entry into a confined space, an entry permit will be completed by a qualified person and the contents communicated to all employees involved in the operation and conspicuously posted near the work location. A standard entry permit should be used for all entries.

### 1. Key Elements for Entry Permits

A standard entry permit should contain the following items:

- \* Permit space to be entered;
- \* Purpose of the entry;
- \* Date of the permit and the authorized duration of the entry permit,
- \* Name of authorized entrants within the permit space;
- \* Means of identifying authorized entrants inside the permit space, e.g., rosters or tracking systems;
- \* Personnel, by name, currently serving as attendants,
- \* Individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry,
- \* Hazards of the permit space to be entered,
- \* Measures used to isolate the permit space and to eliminate or control permit space hazards before entry, e.g., lockout or tagout of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces;
- \* Acceptable entry conditions,
- \* Results of initial and periodic tests performed, accompanied by the names or initials of the testers and by an indication of when the tests were performed;

- \* Rescue and emergency services that can be summoned and the means, (e.g., equipment to use, phone numbers to call) for summoning those services,
- \* Communication procedures used by authorized entrants and attendants to maintain contact during the entry,
- \* Equipment to be provided for compliance with this section, (e.g., PPE, testing, communications, alarm systems, and rescue);
- \* Other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and
- \* Additional permits, such as for hot work, that have been issued to authorize work on the permit space.

A permit is only valid for one shift. For a permit to be renewed, several conditions should be met before each re-entry into the confined space. First, atmospheric testing should be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place. Second, a qualified person should verify that all precautions and other measures called for on the permit are still in effect. Finally only operations or work originally approved on the permit should be conducted in the confined space.

A new permit should be issued or the original permit reissued whenever changing work conditions or work activities introduce new hazards into the confined space. The employer should retain each cancelled entry permit for at least one year to facilitate the review of the confined space entry program. Any problems encountered during an entry operation should be noted on the pertinent permit so that appropriate revisions to the confined space permit program can be made.

## **7. Entry Procedures**

Whenever entry into a confined space is needed, either an Entry Supervisor or the person in charge of the job may initiate entry procedures, including the completion of a confined space entry permit. Entry into a confined space should follow the standard entry procedure.

The following are requirements for standard entry:

- \* Training to establish personnel proficiency in the duties required,
- \* Atmospheric testing for entry, and
- \* Atmospheric monitoring during the entry.

Before an employee enters the space, the internal atmosphere should be tested with a calibrated, direct-reading instrument. If a hazardous atmosphere is detected during entry:

- \* The space should be evaluated to determine how the hazardous atmosphere developed, and
- \* Measures should be implemented to protect employees before any subsequent entry takes place.

Personnel should be prohibited from entering hazardous atmospheres without wearing proper respiratory equipment as determined by qualified entry supervisors. The entire confined space entry permit should be completed for a standard entry. Entry should be allowed only when all requirements of the permit are met and it is reviewed and signed by an Entry Supervisor.

## **8. Opening a Confined Space**

Any conditions making it unsafe to remove an entrance cover should be eliminated before the cover is removed. When entrance covers are removed, the opening should be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent anyone from falling through the opening. This barrier or cover should protect each employee working in the space from foreign objects entering the space. If it is in a traffic area, adequate barriers should be erected.

## **9. Atmospheric Testing**

Atmospheric test data is needed prior to entry into any confined space. Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable conditions exist for entry into that space. If a person must go into the space to obtain the needed data, then Standard Confined Space Entry Procedures should be followed (i.e., rescue team, attendant, entry supervisor). Before entry into a confined space, a qualified person should conduct testing for hazardous atmospheres. The internal atmosphere should be tested with a calibrated, direct-reading instrument for the following, in the order given:

- \* Oxygen content,
- \* Flammable gases and vapors, and
- \* Potential toxic air contaminants.

Testing equipment used in specialty areas should be listed or approved for use in such areas. This listing or approval should be from nationally recognized testing laboratories such as Underwriters Laboratories or Factory Mutual Systems.

### 1. Evaluation Testing

The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity. The analysis should identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data and development of the entry procedure should be done by, or reviewed by, a technically qualified professional (e.g., OSHA consultation service, certified industrial hygienist, registered safety engineer, certified safety professional).

### 2. Verification Testing

A confined space which may contain a hazardous atmosphere should be tested for residues of all identified or suspected contaminants. The evaluation testing should permit specified equipment to determine that residual concentrations at the time of testing and entry are within acceptable limits. Results of testing (i.e., actual concentration) should be recorded on the permit. The atmosphere should be periodically retested to verify that atmospheric conditions remain within acceptable entry parameters. Initial testing of atmospheric conditions and subsequent tests after a job has been stopped should be done with the ventilation systems shut down. If the confined space is vacated for any period of time, the atmosphere of the confined space should be retested before re-entry is permitted. Further testing should be conducted with ventilation systems turned on to ensure the contaminants are removed and that the ventilation system is not causing a hazardous condition.

### 3. Acceptable Limits

The atmosphere of the confined spaces should be considered within acceptable limits whenever the following conditions are maintained:

- \* Oxygen - 19.5% to 23.5%,
- \* Flammability - less than 10% of the Lower Flammable Limit (LFL), and
- \* Toxicity - less than recognized ACGIH exposure limits or other published exposure levels (e.g. OSHA PELs, NIOSH RELs).

Whenever testing of the atmosphere indicates levels of oxygen, flammability, or toxicity that are not within acceptable limits, entry should be prohibited until appropriate controls are implemented. If the source of the contaminant cannot be determined, precautions should be adequate to deal with the worst possible condition in the confined space. If there is the possibility that the confined space atmosphere can become unacceptable while the work is in progress, the atmosphere should be constantly monitored and procedures and equipment should be provided to allow the employees to quickly and safely exit the confined space.

#### **10. Isolation and Lockout / Tagout Safeguards**

All energy sources which are potentially hazardous to confined space entrants should be secured, relieved, disconnected and/or restrained before personnel are permitted to enter the confined space. Equipment systems or processes should be locked out or tagged out or both per 29 CFR 1910.147 and ANSI Z244.1-1982, Lockout/Tagout of Energy Sources prior to permitting entry into the confined space. The current lockout/tagout program being used at the site should be used as guidance. In confined spaces where complete isolation is not possible, provisions should be made for as rigorous an isolation as practical. Special precautions should be taken when entering double walled, jacketed, or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.

Where there is a need to test, position or activate equipment by temporarily removing the lock or tag or both, a procedure should be developed and implemented to control hazards to the occupants. Any removal of locks, tags, or other protective measures should be done in accordance with ANSI Z244.1-1982.

#### **11. Ingress / Egress Safeguards**

Means for safe entry and exit should be provided for confined spaces. Each entry and exit point should be evaluated to determine the most effective methods and equipment to be utilized to enable employees to safely enter and exit the confined space.

Appropriate retrieval equipment or methods should be used whenever a person enters a confined space. Use of retrieval equipment may be waived by the designated qualified persons if use of the equipment increases the overall risks of entry or does not contribute to the rescue. A mechanical device should be available to retrieve personnel from vertical type confined spaces greater than five feet in depth.

## 12. Warning Signs and Symbols

All confined spaces that could be inadvertently entered should have signs identifying them as confined spaces. Signs should be maintained in a legible condition. The signs should contain a warning that a permit is required before entry. Accesses to all confined spaces should be prominently marked.

## 13. Training

**CCG** will provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of their duties in confined spaces. Training will be provided to each affected employee:

- \* Before the employee is first assigned duties under this section,
- \* Before there is a change in assigned duties,
- \* Whenever there is a change in permit space operations that presents a hazard for which an employee has not been trained, and
- \* Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required in this section or that there are inadequacies in the employee's knowledge or use of these procedures.

The training will establish employee proficiency in the duties required by this section and should introduce new or revised procedures, as necessary, for compliance with this section.

### 1. General Training

All employees who will enter confined spaces will be trained in entry procedures. Personnel responsible for supervising, planning, entering or participating in confined space entry and rescue will be adequately trained in their functional duties prior to any confined space entry. Training will include:

- \* Explanation of the general hazards associated with confined spaces;
- \* Discussion of specific confined space hazards associated with the facility, location or operation;
- \* Reason for, proper use, and limitations of PPE and other safety equipment required for entry into confined spaces;
- \* Explanation of permits and other procedural requirements for conducting a confined space entry;
- \* A clear understanding of what conditions would prohibit entry;
- \* How to respond to emergencies;
- \* Duties and responsibilities as a member of the confined space entry team; and
  
- \* Description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers, and method(s) for alerting attendants.

Refresher training will be conducted as needed to maintain employee competence in entry procedures and precautions.

## 2. Specific Training

### 1. Training for Atmospheric Monitoring Personnel

Training will include proper use of monitoring instruments such as:

- \* Proper use of the equipment;
- \* Knowledge of calibration;
- \* Knowledge of sampling strategies and techniques; and
- \* Knowledge of PELs, TLVs, LELs, UELs, etc.

### 2. Training For Attendants

Training will include the following:

- \* Procedures for summoning rescue or other emergency services, and
- \* Proper utilization of equipment used for communicating with entry and emergency/rescue personnel.

### 3. Training for Emergency Response Personnel

Training will include:

- \* Rescue plan and procedures developed for each type of confined space that are anticipated to be encountered,
- \* Use of emergency rescue equipment,
- \* First aid and CPR techniques, and
- \* Work location and confined space configuration to minimize response time.

### 4. Verification of Training

Periodic assessment of the effectiveness of employee training will be conducted by a qualified person. Training sessions will be repeated as often as necessary to maintain an acceptable level of personnel competence.

## **14. Emergency Response**

### 1. Emergency Response Plan

A plan of action will be written with provisions to conduct a timely rescue for individuals in a confined space should an emergency arise.

### 2. Retrieval Systems or Methods to Facilitate Non-entry Rescue

Retrieval systems will be used whenever an authorized person enters a permit space, unless the equipment increases the overall risk of entry or the equipment would not contribute to the rescue of the entrant. Retrieval systems should have a chest or full body harness and a retrieval line attached at the center of the back near shoulder level or above the head. If harnesses are not feasible or create a greater hazard, wristlets may be used in lieu of the harness. The retrieval line should be firmly fastened outside the space so that rescue can begin as soon as anyone is aware that retrieval is necessary. A mechanical device should be

available to retrieve personnel from vertical confined spaces more than five feet deep.