SAFETY MANUAL TABLE OF CONTENTS

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1. **SCOPE**

Outline the duties and responsibilities of the Project Manager, Superintendent, Foreman/Supervisor and Subcontractors.

2. **GENERAL**

The success of the SIERRAS CONSTRUCTION Safety Program is dependent on employee cooperation and strict compliance with established safety rules, regulations, policies and the commitment to safety as a value. While management and employees share safety responsibilities, management must establish the policies by which safety offenders are disciplined. Those individuals who refuse to comply with the SIERRAS CONSTRUCTION Safety Program in providing a safe place of employment will be notified in writing and subject to removal from the project.

**REQUIREMENTS**

A. **Project Manager**

The Project Manager is responsible for the overall administration and effectiveness of SIERRAS CONSTRUCTION’s Safety Program:

1. Plan and execute all work to comply with the stated objectives of the SIERRAS CONSTRUCTION Safety Program.
2. Authorize corrective action of unsafe acts and/or substandard safety conditions.
3. Provide personal protective equipment.
4. Provide training and personal protective equipment to employees for any hazardous conditions or material.
5. Enforce compliance with all applicable Federal, State, Client and SIERRAS CONSTRUCTION safety and Health Standards.
6. Review all accidents and institute corrective action to prevent recurrence,

B. **Superintendent**
The Superintendent is responsible for the Safety Program on a daily basis:
1. Perform safety inspections of project and direct the employee or Subcontractor to take necessary corrective action to eliminate unsafe acts and/or conditions.
2. Explain the safety policy to subcontractors prior to their start on the project.
3. Attend Subcontractor safety meetings and evaluate effectiveness.
4. Advise Project Manager of project safety status.
5. Conduct safety meetings.
6. Determine the personal protective equipment needed by employees.
7. Report and record promptly the results of all accident or incident investigations.

C. **Foreman/Supervisor**

The Foreman/Supervisor is responsible for the Safety Program at the employee level and is an integral part of an effective safety program. Efforts towards accident prevention determines the establishment of an injury free environment:
1. Educate the employee on safe work practices and methods at the time of the work assignment.
2. Ensure employees are trained for each job task that is assigned to them.
3. Provide the employee with the proper protective equipment and suitable tools for the job.
4. Monitor the correct use of such equipment.
5. Monitor Daily site conditions and practices. Immediately report any unsafe conditions and/or practices to Superintendent or Project Manager.
6. Acquaint and enforce all applicable safety requirements with the employee.
7. Set a good example.
8. Make a complete investigation of all accidents to determine the facts.
9. Assist in the completion of required Accident Reports.

D. **Subcontractor**

Each Subcontractor shall be directly responsible for preventing their employees from working under conditions which are unsafe, unhealthy or unsanitary. Their compliance with the
Occupational Safety and Health Act (OSHA), the Mine Safety and Health Act (MSHA) and the SIERRAS CONSTRUCTION Project Safety Program is mandatory. Disregard of accepted healthy and environmental standards will not be tolerated. Subcontractors will:

1. Have a Drug and Alcohol Program at least as stringent as SIERRAS CONSTRUCTION's Drug and Alcohol Program.

2. Monitor and prohibit the use of unsafe machinery, tools, materials or equipment.

3. Permit only qualified employees to operate equipment and machinery.

4. Instruct their employees in all applicable regulations concerning their work environment, and in recognizing and avoiding all unsafe conditions.

5. Instruct their employees in the safe handling and use of flammable liquids, gases, toxic materials, poisons, caustics and other harmful substances. Employees shall be made aware of the potential hazards, the necessary personal hygiene and the personal protective equipment required.

6. Provide training for employees required to enter confined or enclosed spaces and of the nature of the hazards involved. They shall also advise on the necessary precautions to be taken, and in the proper use of any personal protective equipment and emergency equipment required.

7. Supply Material Safety Data Sheets (MSDS) on all materials brought on the project that require them and provide a copy to SIERRAS CONSTRUCTION Project Management.

8. Conduct weekly safety meetings and provide a copy of the meeting record, to SIERRAS CONSTRUCTION Project Management.

E. Employee Safety Reprimand

When it is necessary to warn an employee of an infringement of company safety rules, a written reprimand must be issued on the Employee Warning Notice Form. The purpose of this letter is to document any violation(s) by an employee and actions taken by Company.

The Employee Warning Letter must be filled out immediately following infringement. The supervisor and employee shall complete applicable sections and sign the warning letter.

REFERENCES

29CFR1926.16

29CFR1926.21
1. SCOPE

Items that must be verified, posted, provided or on hand when a construction project is started.

2. GENERAL

The success of the SIERRAS CONSTRUCTION Safety Program is dependent on employee cooperation and strict compliance with established safety rules, regulations, policies and the commitment to safety as value. This section shall include, the minimum safety requirements needed to start work on a jobsite.

3. REQUIREMENTS

A. Establish means by which to receive emergency medical assistance.
B. Establish a location and routing to the nearest emergency room, clinic or physician’s office.
C. Provide readily available transportation or a communication system to contact an ambulance for transporting injured or ill employees.
D. Ensure that a medical facility is readily accessible or at least 1 employee with a valid certificate in first-aid training is at the job site.
E. A first-aid kit in a weatherproof container with sealed packages for each item shall be easily accessible at the job site.
F. Emergency telephone numbers shall be posted near telephones.
Q. Setup a bulletin board accessible to employees. The following items shall be included:

   1. Occupational Safety and Health Poster
   2. Worker's compensation poster for appropriate state.
   3. Emergency phone numbers, i.e fire department, ambulance; hospital.
   5. Crane Hand Signal Chart (if applicable)
   7. Evacuation Plan
NOTE:
Bulletin boards will be located where they are readily accessible to employees and be constructed in such a manner to provide protection for the information placed on it. On those cases where no jobsite trailer is available, gangboxes or other adequate means shall carry this information.

If SIERRAS CONSTRUCTION is working as a subcontractor, check with General Contractor on items A to F that might had already been established for the jobsite, and coordinate with their safety personnel/program.

H. The following items shall be on file, for use when required:
1. An OSHA 200 log.
2. Worker's compensation First Reports of Injury for the appropriate state.
5. Request for Medical Services.
7. Employee Safety Orientation and Handbooks.

I. A supply of the following personal protective equipment shall be on hand:
1. Hard hats for employees, visitors and suppliers.
2. Safety glasses with side shields and clear lenses.
3. Safety goggles with indirect venting, chemical goggles.
4. Disposable foam ear plugs.
5. Disposable respirators as appropriate.
6. Metal toe guards for use with compactors or pavement breakers when such activities are projected to take place.
7. Face shield with hardhat attachments.
8. Full body safety harness with shock absorbing lanyards.

9. High visibility reflective vests for employees, visitors and suppliers.

J. Potable drinking water with disposable cups.

K. One toilet per every fifteen (15) employees.

L. Fire extinguishers.

M. Containers for trash, scrap and waste.

NOTE:
If the project is for mining company or on mine property, it is important that you determine MSHA requirements. Contact the client, your Contract Manager or the Safety Department for assistance.

REFERENCES

29CFR 1910 and 1926
30CFR Parts 45, 48, 50, 56, 57, 58, 75, and 77
NFPA
NEC
40 CFR
49 CFR
Establish procedures relevant to compliance with the Occupational Safety and Health Act (OSHA) and the Mine Safety and Health Act (MSHA) requirements.

GENERAL

The Company policy is to permit inspections by representatives of regulatory agencies, (State and Federal Occupational Safety and Health Agencies, Mining Safety and Health Administrations and the Environmental Protection Agency (EPA).

REQUIREMENTS

A. Regulatory Agency Inspection

1. Upon arrival at the SIERRAS CONSTRUCTION work site, the Inspector will be directed to the project office.
2. All SIERRAS CONSTRUCTION supervision shall be informed of the Inspector's presence on site.
3. SIERRAS CONSTRUCTION will notify our client when applicable.
4. The Inspector shall wait for the designated SIERRAS CONSTRUCTION representative.
5. If the SIERRAS CONSTRUCTION representative is not available within thirty (30) - sixty (60) minutes, the Inspector shall be informed of this fact. SIERRAS CONSTRUCTION's policy requires the presence of the SIERRAS CONSTRUCTION representative during inspection and cannot proceed without the representative. Inform the Inspector that SIERRAS CONSTRUCTION does not require a warrant for OSHA inspections (MSHA has the right to inspect).
6. Once the SIERRAS CONSTRUCTION representative is available, the Inspector will hold an opening meeting. At this time, the Inspector's credentials will be reviewed.
7. If the Inspector has not mentioned the reason for the inspection the SIERRAS CONSTRUCTION representative should ask why it is being conducted. Learn the basis for the inspection, and limit the inspection to that reason. For example - if the Inspector wants to inspect a...
crane, limit the inspection to that crane. Upon completion of the opening meeting, the Inspector will proceed with the inspection.

A SIERRAS CONSTRUCTION representative shall accompany the inspector throughout the inspection. The only exception to this requirement is when the Inspector requests to talk to company employees in private.

NOTE:
_Agencies are entitled to privacy when questioning employees, unless the employee waives that right._

10. Throughout the inspection the SIERRAS CONSTRUCTION representative will be courteous to the Inspector, cooperative and respond to all questions.

NOTE:
_Detailed explanations are not encouraged as they tend to prolong the inspection._

11. The SIERRAS CONSTRUCTION representative or any other SIERRAS CONSTRUCTION employee is not to speculate when responding to questions.

12. If SIERRAS CONSTRUCTION is currently conducting an investigation of an accident, and the investigation is not completed, defer all answers to questions asked until the investigation is complete.

13. With the exception of trade secrets, the Inspector is authorized to take photographs and samples during the inspection. If the Inspector performs these actions, the SIERRAS CONSTRUCTION representative should do the same.

14. SIERRAS CONSTRUCTION representative should:
   a. Keep a detailed record of the scope of the inspection.
   b. List the SIERRAS CONSTRUCTION employees questioned by the Inspector.
   c. Note items of apparent interest to the Inspector.
   d. Record comments made by the Inspector.
   e. Record observations made during the inspection.
15. Upon completion of the inspection, the SIERRAS CONSTRUCTION representative shall request a closing meeting to be held. More than one SIERRAS CONSTRUCTION representative should be present to ensure that the Company understands all statements made by the Inspector.

16. Following the closing meeting, the company representative should prepare a detailed report of the inspection incorporating any record, notes, samples, photographs, etc., made or taken during the inspection. This report will be sent to the SIERRAS CONSTRUCTION Home office Attn: Safety Department.

B. Citations

In the event an OSHA or MSHA inspection is conducted on the project and the Inspector believes conditions found do not comply with the provisions of the law the nature of the alleged violation(s) will be described in a written citation with reference made to the applicable regulations of the law.

These conditions must be corrected on or before the date shown on each written alleged violation.

Copies of any citations must be faxed to the SIERRAS CONSTRUCTION Home office Attn: Safety Department the same day they are received.

C. Posting of Citation

Both OSHA’ and MSHA require that a copy of all citations be prominently posted at or near each place a violation referred to in the citation(s) occurred. It must remain posted until all violations are corrected or for three (3) working days, whichever period is longer. Working days meaning Monday to Friday – not including weekends and Federal holidays. The Act provides penalties for violations of the posting requirements.

D. Approval

After notification of proposed penalties, SIERRAS CONSTRUCTION has the right to contest any or all parts of the citation and the proposed penalties. If SIERRAS CONSTRUCTION fails to
contest within the fifteen (15) day time period, the citation and the penalties proposed will be deemed to be a final order and not subject to review by any court or agency.

E Abatement

SIERRAS CONSTRUCTION may file notice (letter) to contest the reasonableness of the time stated in the citation for the abatement of alleged violations. Alleged violations that are not contested must be corrected within the specified period noted in the citation. Failure to comply within the abatement period will result in further proposed penalties for each day the alleged violation has not been corrected. Timely correction of an alleged violation does not affect the initial proposed penalty. The OSH/MSH Acts provide that whoever knowingly gives false information is subject to fines and/or imprisonment or both. SIERRAS CONSTRUCTION employees involved in Regulatory Agency inspections on SIERRAS CONSTRUCTION Projects will act in a professional manner at all times, during the inspection.

REFERENCES

OSHA 29CFR 1903.1-21
MSHA 1977 THE ACT - Sections 103, 104,105, 107 and 110
STATE AGENCIES
1. SCOPE.

Establish procedures relevant to first aid/ medical services and recordkeeping / accident reports or near misses.

2. GENERAL

SIERRAS CONSTRUCTION will provide first aid services and arrange emergency transportation of the employee who becomes injured or ill on the job. Project Management is responsible for safety related reports concerning work-related injury or illness.

3. REQUIREMENTS

A. First Aid Medical Treatment

1. First aid supplies will be available to all employees for the treatment of a work related injury or illness.
2. Medical cases which require treatment beyond first aid will be referred to an off-site physician or hospital as determined by the severity of the injury or illness.

B. Emergency Transportation

1. The method of emergency transportation to the first aid facility or hospital will be prearranged. The hospital emergency room will be notified. All available information regarding the nature and extent of the illness or injury shall be given to the medical staff.

C. Non-Emergency Transportation

Transportation shall be provided to a first aid facility. A vehicle will be available at all times.

D. Injury/Illness Reporting Procedures

Project Management is responsible for ensuring safety related reports concerning a work related injury or illness are properly completed and maintained:
1. Request for Medical Services Form will be completed by a SIERRAS CONSTRUCTION representative and given to the employee prior to the employee being taken to a doctor or hospital for treatment. The use and function of this form shall be explained to the employee. It is important that each employee fully understands that the portion of the form (Doctor's Release) must be completed by the attending physician and returned to the Project by the employee before the individual can be allowed to return to work.

2. Supervisor's Injury/Accident Investigation Form will be completed for all injuries sustained by the employee requiring a doctor's attention.

3. Employer’s First Report of Injury or Illness will be used to advise the insurance company of a Worker Compensation claim. This will be completed within twenty-four (24) hours of the injury or illness:
   
   a. Additional State forms may be required.  
   b. Original copies of all medical paperwork & generated forms must be forwarded to SIERRAS CONSTRUCTION Home office Attn: Safety Department, with backup copies kept at the jobsite.

4. The physician is responsible for maintaining accurate records of all medical treatment provided to the employee and furnishing a copy to SIERRAS CONSTRUCTION.

NOTE:  
All Medical Records are confidential and must be kept in a secured locked file.

E. Return to Work

1. An employee who has sustained an on-the-job injury or illness may return to work provided that the attending physician has approved it in writing. The employee shall return to his or her normally assigned job if it is still available and he or she has met any physical restrictions or limitations.

2. Employees who are given restrictions to their work will not be permitted to return to work until a review of the case has been made by:
   
   a. Project Management  
   b. Attending Physician  
   c. Safety Department
REFERENCES

29 CPR 1904.1-.20
29 CPR 1926.23,50
30 CFR Part 50
1. SCOPE

Establish procedures for investigation and reporting of all injuries or illnesses which require medical treatment, first aid cases and near misses.

2. GENERAL

The purpose of the investigation is to identify all possible contributing causes so that future incidents, which are similar in nature, can be prevented. Investigations are to determine all the facts. These may have a bearing on legal liability. In the event of a serious accident, OSHA/MSHA must be notified. A complete investigation must be on file.

NOTE:
Investigations will be directed toward fact finding, not fault finding.

3. REQUIREMENTS

A. Investigation

The investigation shall begin as soon as possible after necessary notifications have been completed.

A written Accident Investigation Report shall be required:

1. When an employee reports an accident or injury, respond promptly to them in a positive manner.

2. Discuss and document the accident with the injured employee when, possible.

3. Discuss and document the accident with witnesses interviews.

4. Consider the following points for documentation:
   a. What was the injured employee doing prior to, and at the time of the accident? Was this part of his / her regular duties?
   b. Was the employee properly trained? Were procedures being followed?
   c. Did any other employee contribute to this accident?
d. Was the equipment or machinery which the injured employee was using in good working condition? Was it properly protected? Was it suited for the purpose for which it was being used?

e. Was the work space sufficiently lighted?

f. Were proper housekeeping conditions maintained?

g. How is the same type of work being accomplished by other employees?

h. Is there a safer way in which this work could be accomplished?

i. Was the injured employee in good health when reporting for work on the day of the accident?

j. Was post accident testing done?

B. Accident/Incident Reporting

All accidents and incidents including near misses, will be reported. A management reporting System will be established to notify:

1. Jobsite Management Personnel

2. SIERRAS CONSTRUCTION Main Office

3. Client

4. Utility (if required)

5. OSHA/MSHA (if required)

6. News Media - Follow the SIERRAS CONSTRUCTION Crisis Management Plan. Only the designated spokesperson shall communicate with the news media.

C. Accident Response

1. Treat injured employee(s).

2. Notify on site medical services or call ambulance if necessary.

3. Control incident area.

4. Prevent further harm to personnel in the area.

5. Notify management personnel.

6. Identify and segregate witnesses.
D. Witness interview and statements.

1. Witnesses should be immediately identified at the scene of the accident. Interview those individuals involved in the accident, and those who witnessed it.

2. Interview witnesses individually, and prevent discussion among the witnesses of the incident. Ask the witnesses to prepare statements of facts separately from one another while other witnesses are being interviewed.

3. The interviewer must be receptive, objective and listen carefully to each witness.

4. The more knowledgeable witnesses should be interviewed first.

5. The following questions should be asked:
   a. Time and location of incident.
   b. Environmental conditions: weather, lighting, temperature, noise, housekeeping, distractions, etc.
   c. Position of people, equipment, materials, and their relation to pre-contact, contact, and post contact events. Include the position of the witness being interviewed.
   d. Other witnesses if known by name, and their position.
   e. If anything was moved, repositioned, turned on or off, or taken from the scene (including injured) during pre-contact, contact or post-contact phases.
   f. Response of emergency teams and supervisory personnel, and their actions at the scene.
   g. What attracted the witnesses attention to the incident.

6. A formal written statement should be obtained from each witness interviewed. The witness should be informed of the purpose and intended use of his /her statement and who will see it.

E. Diagrams, Maps and Sketches

To understand the relative position of people, equipment, and material, diagrams, maps and sketches are helpful, these should include:
1. The injured.

2. Machines, vehicles, equipment, materials.

3. Parts broken off or detached from equipment or materials.

4. Objects which were broken, damaged, or struck during the incident.

5. Gouges, scratches, dents, paint smears, skid marks, etc., on surfaces.

6. Tracks or similar traces of movement.

7. Defects or irregularities in surfaces.

8. Accumulation of stains from fluids, whether existing before the incident, or spilled as a result of the incident.

9. Spilled or contaminated materials.

10. Areas of debris.

11. Safety devices and equipment.

F. Photographs

Photographs should be taken to provide:
1. Orientation of the scene of incident.
2. Record of the detail of injury or damage, including the position of a large number of damaged fragments.
3. Evidence of improper assembly of equipment, materials and structures.
4. Detail of marks, spills, and signs.
5. Records of disassembly of parts for analysis by examination.
6. Evidence of deterioration, abuse and lack of proper maintenance.
7. Location of parts overlooked during early stages of investigation.
8. A photographic log should be maintained detailing the subject, lens size, and direction. Points of interest should be noted.

G. Parts, Preservation and Examination
It is extremely important to preserve any equipment, parts or materials, necessary for evidence. Do not substitute any equipment, parts or materials. (The evaluation of those equipment parts or materials involved in the incident may lead to the possible cause of the incident.)

H. Important Evidence to Examine

1. Components of equipment, materials, or structures that are fractured, distorted, scarred, or ruptured.
2. Parts suspected of internal failure.
3. Parts suspected of improper assembly or mating.
4. Parts suspected of deficient material in fabrication, heat treatment, or bonding.
5. Parts that appear faulty in workmanship or design.
6. Parts improperly mounted or inadequately supported.
7. Parts requiring lubrication.
8. Controls and position of operation indicators,
9. Parts that are power sources: engines, motors, and pumps.
10. Substitute or modified parts.
11. Foreign objects and parts that seem different in size, location, shape, color.
12. Fluid spills and stains as well as parts that show signs of leakage.

REFERENCES

29 CFR 1926.20 - 23
30 CFR Part 50
1. SCOPE

Establish the means for instituting and reinforcing a carefully planned program of safety education, training and information.

2. GENERAL

This program includes, new hire safety orientation/indoctrination, supervisor/safety orientation, and weekly safety meetings.

3. REQUIREMENTS

A. New Hire Safety Orientation

Newly hired employees shall be required to have a safety orientation. The orientation is provided to all construction craft, supervisors and office staff. Safety orientation will include:

1. Employees are required to work safely and to adhere to the SIERRAS CONSTRUCTION Safety Program.
2. The reporting procedures for injuries and illness.
3. Employee attendance at weekly safety meetings is mandatory. Employees are encouraged to ask questions, offer suggestions and voice complaints regarding safety on the project.
4. Each employee is required to report all unsafe acts or conditions to their supervisor.
5. Employee Safety Warning Letters will be utilized in warning of unsafe acts by employees. An employee who has received a warning letter is subject to removal from the project if the violation cited in the letter is repeated, or if that violation is considered a no tolerance violation (ie: 100% Tie off).
6. The proper use of personal protective equipment is mandatory. Every employee who is required to wear personal protective equipment shall be instructed in its proper use.
7. Each employee is to be informed on established project emergency procedures in case of serious injury, fire or need for evacuation.
B. Supervisor Safety Orientation

It is necessary that each supervisor is knowledgeable of their safety responsibilities. This safety orientation shall highlight the Employee Safety Handbook and shall include the following items of responsibility:

1. Safe Work Areas - The supervisor shall be familiar with the crews’ work areas and ensure that safe conditions are maintained.
2. Safe Work Practices - The supervisors assigning work tasks shall ensure instruction in the safety practices, work methods and personal protective equipment required.
3. Emergency Procedures - Each supervisor shall be completely familiar with the project emergency procedures.
4. Accident Investigations - Supervisors are required to actively participate in the investigation of all accidents and incidents.

C. Safety Meetings

1. Supervisors shall hold safety meetings with their employees to discuss work practices and conditions related to construction safety.
2. Attendance at these safety meetings is mandatory. Once established, the day, time and location of these meetings shall not be changed.

D. In House Training Programs

SIERRAS CONSTRUCTION provides training and education to employees on the following topics:
1. Safety:
   a. Fall Prevention/Fall Protection
   b. Fire Safety (fire extinguishers)
   c. Confined Space
   d. Lock/out- Tag/out
   e. Fire watch/Hot Work Permits
f. Trenching and Excavations

g. Electrical Safety

h. Cutting and Welding.

i. Personal Protective Equipment

j. Rigging - Material Handling

k. Scaffolding

l. Forklift Operation

2. Health:

   a. Respiratory Protection
   b. Hydrogen Sulfide
   c. Lead
   d. Cadmium
   e. Arsenic
   f. Silica
   g. Bloodborne Pathogens

3. Other:

   a. Hazard Communication
   b. Hazardous Waste Operations and Emergency Response
   c. First Aid/CPR
   d. OSHA500
   e. MSHA
   f. Process Safety Management
   g. Accident Investigation
   h. Zero Accident Environment
E. Documentation: Safety training provided to employees shall be documented using the SAFETY TRAINING form attached

REFERENCES

29 CFR 1926.21
29 CFR 1926.28
30 CFR PART 48
1. SCOPE

To provide incentives for safe work practices through recognition and awards,

2. GENERAL

Awards of recognition for employee safe work behaviors established by the Main Office/Contract Manager or on a project basis.

REQUIREMENTS

A. Level 1

1. Eligibility
   Applicable to all non exempt SIERRAS CONSTRUCTION personnel actively engaged in field operations and not participating on any other bonus program.

2. Target
   a. No lost time recordable accidents
   b. No safety violations
   c. No unexcused absenteeism

3. Reward
   Based on crew safety record. Individual is penalized for absenteeism, but remainder of crew is not. Paid yearly. Administered by Main Office/Contract Manager in conjunction with Corporate Safety.

B. Level 2

1. Eligibility
   Applicable to exempt SIERRAS CONSTRUCTION personnel engaged in supervising field operations with a minimum of twenty thousand (20,000) hours annually under their direct supervision.
2. Target
   a. No lost time accidents.
   b. Must be better than a pre-determined recordable incident rate. (2006 Rate is 4.0)
   c. No serious safety violations.

3. Reward
   Gift certificates, belt buckles, safety award jackets, knives, etc. Administered by the Safety Department.

C. Level 3

   1. Eligibility
   SIERRAS CONSTRUCTION personnel who are in the bonus program (generally field personnel Superintendent III and above who have been with the Company at least one (1) year).

   2. Target
   A pre-determined lost time incident rate (LTIR) and a recordable incident rate (RIR). (2006 LTIR<.8 and RIR < 5.0)

   3. Reward
   A percentage of the over all bonus program applies to safety performance.
1. SCOPE

Implement the required procedures to reduce the exposure to recognized health and environmental hazards.

GENERAL

These guidelines are to provide maximum protection for all employees against known health hazards and to establish procedures for a minimum environmental impact on all projects.

REQUIREMENTS

A. Blood borne Pathogens - Exposure Control Plan

It is recognized that there is a potential for occupational exposure to employees who are required to render first aid and/or CPR at a project and who may come in contact with blood borne pathogens. This plan outlines the required procedures to reduce the exposure to infection with blood borne pathogens:

1. Blood borne pathogens are defined as pathogenic microorganisms that are present in human blood or body fluids and cause disease in persons who are exposed to blood or body fluids containing these pathogens. The two most recognized pathogens are the Hepatitis-B Virus (HBV) and the Human Immunodeficiency Virus (HIV) which results in the disease commonly known as AIDS.

2. "Universal Precautions" is an approach to infection control. Using "Universal Precautions" all human blood and certain human body fluids are treated as if they contain HIV, HBV, and other blood borne pathogens.

3. All Sierras Construction employees that may reasonably anticipate contact with blood or other potentially infectious materials with their skin, eye, mucous membrane, or through parenteral contact shall adhere to this exposure control plan. (Mucous membranes are the internal lining of the nose and parenteral contact is contact through openings in the skin such as needle sticks, human bites, cuts and abrasions).

4. In circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

5. When there is occupational exposure, employees will be provided and shall use personal protective equipment such as gloves, goggles, face shields, one way air valves, aprons or other appropriate equipment:

6. Personal protective equipment shall be replaced as soon as possible when contaminated.

7. All personal protective equipment and contaminated material shall be removed immediately upon leaving the work area and placed in a designated container for disposal.

8. Containers used for contaminated items shall be marked "Bio-Hazard".
9. Training:

a. All employees that are identified as having occupational exposure will participate in a training program.

b. Employees will be trained at the time of initial assignment to tasks where occupational exposure may occur and at least annually thereafter.

c. Additional training may occur when changes such as modification of tasks or procedures or when new tasks or procedures may affect employees' exposure.

d. At a minimum the training for employees with occupation exposure will include:


2) A general explanation of the epidemiology and symptoms of blood borne disease.

3) An explanation of the modes of transmission of blood borne disease.

4) An explanation of this exposure plan and where a copy will be kept.

5) An explanation of methods employees may use to recognize tasks that may involve occupational exposure.

6) An explanation of the methods and their limitations that will prevent or reduce occupational exposure.

7) Information on the selection, limitations, locations, decontamination, and proper disposal of contaminated personal protective equipment and materials.

8) Information on Hepatitis-B Vaccine, including its effectiveness, safety, method of administration, benefits of vaccination, and that vaccine will be administered without cost to the employee.

9) Information on proper procedures in the event of exposure to blood or body fluids, and post exposure follow-up.

10) An explanation of the warning labels and/or color coding systems used in handling and disposal of biohazard waste.

11) An opportunity for the employee to ask follow-up questions and obtain answers during the training.

A record of the training required by this standard shall be kept for at least three (3) years from the date the training occurred.

B. Lead Exposure
Prior to starting a project determination shall be made by the owner, client, and/or SIERRAS CONSTRUCTION of the possibility of lead exposure to employees. On projects with the reasonable belief or potential of lead exposure, an exposure assessment must be made.

Projects involving the use of construction materials containing lead or the potential disturbance of in-place lead paints and coatings should be targeted for detailed evaluation of their potential for lead exposure:

1. An action level of thirty (30) micrograms per cubic meter of air and a permissible exposure limit of fifty (50) micrograms per cubic meter of air has been established by OSHA for the construction industry. The above levels are based on an eight (8) hour time weighted average.

2. Exposure assessment will be accomplished by monitoring, or by objective data that may demonstrate a particular product, material or a specific process, operation, or activity, involves lead.

3. If the exposure assessment estimates an exposure level above that of the action level of thirty (30) Micrograms per cubic meter, engineering and work practice controls will be utilized.

4. Engineering and work practice controls shall be implemented to reduce and maintain employee exposure to lead at or below the permissible exposure limit to the extent that such controls are feasible.

5. On projects where engineering and work practice controls fail to reduce lead exposure to below the action level a medical surveillance program shall be established.

6. On projects where engineering and work practice controls fail to reduce lead exposure to below the permissible exposure limits, a regulated area will be established and a written compliance program will be implemented.

7. Training:
   Initial training prior to the time of job assignment will be conducted on projects where lead exposure exceeds the action levels. The training program shall include:

   a. The content of 29 CFR 1926.62.

   b. The specific nature of the operations that could result in exposure to lead above the action level.

   c. The purpose, proper selection, fitting, use, and limitations of respirators.

   d. The purpose and description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead.

   e. The engineering controls and work practices associated with the employee’s job assignment including training of employees to follow relevant good work practices.

   f. The contents of any compliance plan in effect.
g. Instruction to employees that special drugs called chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

h. The employee right of access to records.

REFERENCES

Blood borne Pathogens

OSHA
29 CFR Part 1910.20
29 CFR Part 1910.1030

Lead Exposure

OSHA
29 CFR 1926.59
29 CFR 1926.62
29 CFR 1910.20
49 CFR 1910.134
1. SCOPE

Safe working practices to minimize or prevent catastrophic results inherent from hazardous environments associated with process plants.

2. GENERAL

All employees are to be trained in the safety requirements that are necessary to perform work in a facility that operates under the Federal process safety management standard. In addition records shall be kept and available for inspection to document this training, level of competency and basic craft training for each employee.

3. REQUIREMENTS

SIERRAS CONSTRUCTION will ensure that employees assigned to work on process facilities are qualified in their crafts and are trained in the applicable aspects of safety. Implementation of SIERRAS CONSTRUCTION’s “Process Safety Management” will begin by requiring the client to submit all pertinent information required by the standard to conduct work safely.

A. Responsibilities

1. Client:

a. Provide SIERRAS CONSTRUCTION with all data pertaining to any and all technological processes where work is to be performed. Information shall include flow diagrams, block flow diagrams, toxicity information, corrosive data, chemical stability and hazards involved.

b. Provide information on all equipment used in the process, a Process Hazard Analysis (PHA) if appropriate, all temporary changes to the process system and an emergency action plan for the facility. In cases where this information is secret, SIERRAS CONSTRUCTION management shall sign the appropriate confidentiality agreement prior to the receipt of this information.

SIERRAS CONSTRUCTION Project Management:

a. General:

1) Receive and study all information provided by the client in order to have a complete understanding of the highly hazardous chemicals used in the process system.

2) Obtain all Material Safety Data Sheets regarding chemicals, and other materials used on the project.

3) Analyze all information provided, noting all existing potential hazards, have all safety and personal protective equipment available and provide orientation/training classes.

b. Skill Level Identification:

1) Responsible for testing all employees to find their level, of training and experience for each craft. If a Supervisor has the knowledge of an employee’s experience in a process unit and feels confident that they fully understand the procedures, he may, in lieu of training certify in writing...
that the individual has the knowledge and skills to safely carry out the work in accordance with the established procedures.

2) Assign helpers to experienced foreman/craftsmen to enhance the helpers knowledge and gain experience in their craft and ensure they follow safe work practices.

3) Not allow an employee to work in a facility for which he/she has no knowledge.

c. Training and documentation:

1) Train employees assigned to new work areas in a facility to assure they have all the knowledge and skills to conduct their work safely. Upon completion, the training shall be logged on the job safety assignment form that notes the process system, type of work to be performed, date/time of training and signature of trainer. Copies of this form shall be placed in the individual's personnel file.

2) Copy all test results or written certification to the employee's file on the project. Original copy of all test results shall be sent to the main office and placed in their personnel file.

3) Employees scoring less than eighty five percent (85%) on the individual craft test shall not be considered competent to work as a craftsman but maybe utilized as a helper.

4) Applicants failing to obtain a passing grade may continue to work as a helper shall be allowed to be retested after a period of time (normally three (3) months), or at the discretion of the Superintendent.

**B. Process Management Program**

1. Employee training: Employees shall be provided a safety orientation from Project Management, including the following subjects:
   a. Plant Emergency signals
   b. Plant Emergency telephone numbers
   c. Evacuation routes and assembly areas
   d. Smoking rules
   e. Traffic rules
   f. Environmental concerns
   g. Reporting hazards
   h. Work permits
   i. Highly hazardous chemicals/gases/materials

2. When work requires additional training, selected employees shall receive the following:
   a. Firewatch training,
   b. Cascade System/Self Contained Breathing Apparatus (SCBA) Supplied Air Training
   c. Rescue
   d. Competent Person (Trenching & Excavating)
   e. HAZWOPER
   f. Shielding of welding operations
3. Only employees that have completed the initial safety orientation and the training for highly hazardous chemicals/gases/materials will be allowed to access the work area. A list of trained employees shall be submitted to the client.

4. Project Management shall maintain a master list of all personnel that have received training, including the date it was conducted. A list of trained personnel shall be on file on specific subjects that require retraining by Federal or State Regulations such, as the yearly Hazardous communication (Right to Know) Program.

5. Employees who are new to the craft shall be given additional training.

C. Permits

Permits shall document the protection requirements, such as barricades and firewatch, indicate the authorized date(s), and identify the process and unit to be worked on, and the need (if any) for Personal Protective Equipment (PPE).

D. Mechanical Integrity/Quality Assurance

SIERRAS CONSTRUCTION shall assure all fabrications, equipment and procedures used are suitable for process applications, and are consistent with design specifications. All testing and inspections shall be documented by QA/QC representative or the project management designee.

E. Safety Audits

SIERRAS CONSTRUCTION Management shall assure that all requirements of the SIERRAS CONSTRUCTION Safety Program are in compliance, including the following records:

1. Training records on all assigned employees
2. Respirator training records
3. Hazard Communications Program (MSDS)
4. Air monitoring logs
5. Crane inspection forms
6. Rigging inspection forms
7. First aid logs
8. OSHA 200 and accident reports
9. Weekly safety meeting reports
10. All monthly inspection reports
11. Master list of all training conducted
12. All records required by Section 10 of this manual

REFERENCES

29 CPR 1926.64
HAZARD COMMUNICATION PROGRAM

1. SCOPE

Procedures provided to employees to assure exposure to hazardous chemicals and materials are eliminated or held to a minimum.

2. GENERAL

Information necessary for the safe use, handling and storage of hazardous chemicals and materials will be made available to employees, and includes guidelines on identification of chemical hazards and the preparation and proper use of container labels, placards and other types of warnings. This program may also be referred to as “Your Right to Know”.

3. REQUIREMENTS

A. Chemical Inventory

1. Sierras Construction will maintain an inventory of all known chemicals in use on its projects. A chemical inventory list shall be available from project management.

2. Hazardous chemicals brought onto the project by SIERRAS CONSTRUCTION shall be included on the same chemical inventory list.

B. Container Labeling

1. Chemicals shall be stored in their original, or approved smaller containers with proper labeling attached. Any container not properly labeled should be given to management for labeling or proper disposal.

2. Employees may dispense small quantities of chemicals into other than the original containers when intended for immediate use. All unused chemical left after work is completed must be returned to the original storage container.

3. No unmarked containers of any size are to be on the project.

4. SIERRAS CONSTRUCTION shall rely on manufacturer applied labels whenever possible, and shall ensure labels are maintained, complete with any appropriate hazard warning.

C. Material Safety Data Sheets (MSDS)

1. Employees working with hazardous chemicals may request a copy of the material safety data sheet (MSDS). Requests for MSDS should be made to the project management.

2. MSDS shall be available on the project to provide immediate reference to chemical safety information.
HAZARD COMMUNICATION PROGRAM

D. Employee Training

Employees shall be trained to work safely with hazardous chemicals during their safety orientation and annually thereafter. Employee training shall include:

1. Methods used to detect a release of a hazardous chemical(s) in the work place.

2. Physical and health hazards associated with chemicals being used.

3. Protective measures to be taken.

4. Safe work practices, emergency responses and the use of personal protective equipment.

5. Information on hazard communication standard including:
   a. Labeling and warning systems.
   b. An explanation of Material Safety Data Sheets.

E. Personal Protective Equipment (PPE)

The required PPE is available on all projects. An employee working with hazardous chemicals without the provided PPE is subject to disciplinary actions.

F. Emergency Response

1. Any incident of exposure or spill of a hazardous chemical/substance must be reported to project management at once.

2. Project management shall be responsible for insuring that proper emergency response actions are taken in leak/spill situations.

G. Hazards of Non-Routine Tasks

1. Project management shall inform employees of any special tasks that may involve possible exposure to hazardous chemicals during work assignment.

2. Review of safe work procedures and use of required PPE shall be conducted prior to the start of such tasks. Where necessary, areas shall be posted to indicate the nature of the hazard involved.

H. Informing Other Employers

1. Employers are required to adhere to the provisions of Hazard Communication Standard.

2. Information on hazardous chemicals known to be present shall be exchanged with other employers in the same area of the jobsite. Employers shall be responsible for providing necessary information to their employees.
3. All onsite employees shall have access to a copy of SIERRAS CONSTRUCTION’s hazard communication program.

I. Posting

Information shall be posted on the project bulletin board as required under the Hazard Communication Standard as follows:
1. Inventory List of Chemicals (see Section 11A)
2. Copy of Section 11.

REFERENCES

29 CPR 1926.59
1. SCOPE

Identify personal protective equipment designed to provide an effective barrier between a person and potential exposure to hazards.

2. GENERAL

Personal protective equipment must be used in addition to proper clothing. Proper clothing consists of long pants and shirts with sleeves. Dragging, baggy pants, baggy shirts, torn or loose long sleeves, boots with bad or torn toes, soles or heels will not be allowed. Supervisors will monitor/evaluate the use and effectiveness of all personal protective equipment and recommend improvements.

3. REQUIREMENTS

A. Basic Equipment

1. SIERRAS CONSTRUCTION shall ensure that the following personal protective equipment is available prior to the start of any construction activity:
   a. A supply of hard hats (meeting ANSI Z.89.1 standards). Orange color for crafts and white color for supervision. (Alternate colors may be required by owner.)
   b. A supply of safety glasses with side shields (meeting ANSI Z.87.1 standards) and side shields for prescription glasses.

   The following will be available for project specific requirements;
   a. Goggles.
   b. Full body safety harness with shock absorbing lanyards. Three (3) foot lanyards with rope grabs.
   c. Respiratory protective equipment as dictated by hazard.
   d. Hearing protection.
   e. Foot guards when contract calls for compacting, jack hammering, etc.
   f. Cutting goggles, shields, welding hoods, lens and welding gloves if welding and burning operations are anticipated.
   g. Full face shields (for operations producing flying chips, particles or sparks)
   f. Rubber boots, gloves, etc. (for concrete placing operations).

2. Project Management shall ensure that an adequate stock of the required equipment is available.

3. Employees are required to provide their own ANSI approved work boots with steel toe protection or equivalent.

B. Personal Protective Equipment

1. Personal Protective Equipment must meet the following requirements:
PERSONAL PROTECTIVE EQUIPMENT

a. Provide the maximum protection against the hazard to which the employee will be exposed.

b. Maximum comfort combined with minimum weight.

c. Minimum restrictions of essential body movement, vision, etc.

d. Durability and the ability to be maintained on the project.

e. Manufactured in accordance with the accepted standards for performance and materials, i.e: American National Standards Institute (ANSI), and National Institute for Occupational Safety and Health (NIOSH).

2. When the use of personal protective equipment is necessary, the use of such protection shall be mandatory. Failure to use protective equipment when necessary shall result in disciplinary action.

C. Head Protection

1. Company approved hard hats must be worn at all times. Hard hats need not be worn in the field office.

2. Hard hats cannot be altered in any way.

3. Hard hat decals must be approved by SIERRAS CONSTRUCTION management.

4. Hair must be contained by some means or manner that shall not cause danger to an employee from fire or entanglement in machinery.

5. Hard hats shall be routinely worn with the bill forward as the bill is designed to protect the face.

D. Hearing Protection

1. Engineering controls shall be utilized to reduce noise to below occupational exposure limits when ever possible.

2. Employees exposed to noise in excess of the Occupational Exposure Limits shall have hearing protection provided.

3. Employees are to be informed of the hazards associated with exposure to noise and the purpose and limitations of protective hearing devices. The wearing of this equipment is mandatory in areas where noise is in excess of Occupational Exposure Limits.

E. Eye and Face Protection

1. Approved safety glasses with side shields shall be worn by all employees and visitors during working hours in all areas outside the office.

2. Additional eye and/or face protection such as goggles, face shields, and welding shields are required at all times when engaged in operations such as welding, burning, grinding, chipping, handling chemicals, corrosive liquids, or molten materials.
F. Hand Protection

1. Suitable gloves shall be worn when handling materials and equipment.
2. Plastic or rubber-coated gloves are to be used for special types of work (e.g., solvents, chemically treated material, concrete).

3. Dielectric tested rubber gloves are to be used on all power line work and where there is possible contact with energized circuits (e.g., concrete breaking, drilling and excavating). Always inspect gloves before using.

G. Foot Protection

1. Employees are required to wear sturdy work boots with safety toe protection (steel toe or equivalent).
2. Employees shall be required to wear approved foot guards when safety toe work boots do not provide sufficient protection.
3. Tennis shoes; running shoes, light canvas shoes, sandals, etc., are not authorized for wear in construction areas.

H. Full Body Safety Harness, Lanyards and Life Lines

Employees whose work places them outside of any secured area otherwise protected by guardrails or where their work is to be performed on suspended scaffolds or any other working surface where they may be subject to a fall greater than six (6) feet shall wear and use, a full body safety harness with two (2) shock absorbing lanyards or equivalent.

I. Respiratory Protection

1. Employees who are or may be exposed to hazardous concentration of gases, vapors, smoke, fumes, mist or dust shall be provided, and required to wear, respiratory protective equipment designed to protect the employee from such concentrations. A written work site specific respiratory program shall be established and administered by a trained program administrator.

2. The written respiratory program shall identify and evaluate the respiratory hazard(s) in the work place and selection of appropriate respirator(s) shall be based on this evaluation.

3. A sufficient number of respirator models and sizes shall be provided so that the respirator is acceptable to and correctly fits the user.

4. A medical evaluation shall be provided to determine the employee’s ability to use a respirator before the employee is fit tested or required to use the respirator in the work place. The medical evaluation shall be provided by a physician or other licensed health care professional (PLHCP) using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.
5. Fit testing must be performed prior to initial use, or whenever a different face piece (size, style, model or make) is used. The fit test method (qualitative or quantitative) shall be established and incorporated into the written respirator program.

6. An area and equipment shall be established for the cleaning and disinfecting, storage, inspection and repair of respirators used by employees.

7. Training shall be provided to employees who are required to use respirators that will include proper use, limitation and maintenance. The training shall be comprehensive, understandable and recur annually or more often if necessary.

8. Work place evaluations shall be conducted to ensure that the written respiratory protection program is being properly implemented. Written information regarding training, medical evaluations, and fit testing shall be kept on site. Medical records must be kept separate.

NOTE:
Review of Section 17, Abrasive blasting.

REFERENCES

29 CFR 1926.52
29 CFR 1926.100-105
29 CFR 1910.132
29 CFR 1910.134
29 CFR 1910.138
1. SCOPE

Procedures to provide protection for employees exposed to falls above six (6) feet in elevation.

2. GENERAL

Provide guidelines for maximum protection for employees against falls from elevations above six (6) feet. Guidelines include planning, fall prevention and fall protection.

3. REQUIREMENTS

A. Planning

Individual project planning is necessary and should include at a minimum:

1. Schedules of project materials
2. Equipment, material and supplies needed for fall prevention and protection
3. Work sequence
4. Employee orientation
5. Training
6. Inspection
7. Maintenance
8. Rescue training

B. Fall Prevention

All projects shall make maximum use of fall prevention systems such as scaffolds, aerial lifts, personnel hoists, ladders and stairways.

1. Fall Prevention Systems:

a. These systems provide walking and working surfaces in elevated areas. Systems are free from floor openings, equipped with standard guard rail systems on all open sides and with closure apparatus for ladder openings or other points of access when required. These systems shall include; scaffolds, aerial lifts and other approved personnel hoisting apparatus.

b. Standard guard rail systems consist of a top rail approximately forty-two (42) inches above the walking/working surface, a mid-rail at twenty-one (21) inches above the walking/working surface and a four (4) inch high toe board, and the entire system must be capable of supporting two hundred (200) pounds of force in any direction.

c. Floor opening/hole covers are used to close openings and holes in floors, platforms and walkways. These covers must be capable of supporting the maximum potential load they may be subjected to. Covers are secured against displacement and identified as hole covers.
2. Personnel Lifts/Hoisting Devices:
   a. Employees riding in or working from lifts must secure their safety lanyard to the lift basket at all times.
      
   b. Lifting devices shall be placed on solid level surfaces so as to reduce the possibility of overturning.

3. Sky-Climbers and Spiders:
   a. Employees riding in or working from these devices shall be provided an independent lifeline and rope grab to which their safety lanyard shall be secured.
      
   b. Each lifeline shall be secured to an individual anchor point.

4. Crane Hoisted Personnel Baskets/Platforms
   Use of these devices shall comply with the safety procedures set forth in Section 22 of SIERRAS CONSTRUCTION’s Safety Manual.

C. Fall Protection

Employees in elevated areas six (6) feet or more above ground level or adjacent surfaces where a fall exposure exists shall secure their safety lanyard at all times to a structure, lifeline or approved fall arresting device capable of supporting five thousand four hundred (5400) pounds.

1. Fall protection equipment and systems:
   a. Shall be inspected prior to each use for damage and/or deterioration. Defective equipment shall be immediately removed from service and be destroyed or repaired.

   b. Shall be immediately removed from service if it has been subjected to a shock load.

   c. Shall not be used for any other purpose other than employee guarding.

2. Full Body Safety Harness and Shock Absorbing Lanyards:
   a. Shock absorbing lanyards shall be the double locking type and shall not exceed six (6) feet in length. A two (2) lanyard system shall be used when necessary.

   b. Full body safety harness and shock absorbing lanyards not furnished by SIERRAS CONSTRUCTION shall be inspected and approved by the project management prior to use.

3. Lifelines:
   a. Lifelines shall be capable of supporting five thousand four hundred (5400) pounds.

   b. Lifelines shall not be used for any purpose other than fall protection.
c. Anchor points for lifelines shall be capable of supporting five thousand four hundred (5400) pounds.

d. Horizontal lifelines shall be 3/8 inch wire rope cables as a minimum and shall be secured on each end by at least two (2) cable clamps.

e. Horizontal lifelines should be placed to, provide hook up points, at least waist high for personnel.

f. Vertical lifelines shall be 5/8 inch synthetic rope.

g. Vertical lifelines shall be used with approved rope grabs with three (3) foot lanyards designed for use with 5/8 inch rope.

h. Retractable lifelines shall be approved for use in fall protection.

i. Retractable lifelines shall be secured by means of shackles and/or wire rope slings or synthetic slings.

j. Retractable lifelines shall have a rope tag line attached for extending the line to lower elevations whenever necessary.

4. Temporary Work Platforms and Walkways:

All temporary work platforms or walkways shall be provided with a safe means of access/egress which allows personnel to be secured at all times. Rope grabs or retractable lifelines shall be used to achieve fall protection while ascending or descending the temporary work platforms or walkways.

5. Safety nets may be used in some situations as fall protection. The installation and use of safety nets shall be under the direction of the Safety Department.

REFERENCES

29 CFR 1926.28
29 CFR 1926.194
29 CFR 1926.105
29 CFR 1926.106
29 CFR 1926.451
29 CFR 1926.500
29 CFR 1926.651
1. SCOPE

Confined space entry requirements including, training, safety equipment, permitting, and standby personnel associated with confined space entry. For the purposes of this section, confined space means any space having a limited means of egress or which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

2. GENERAL

Most confined spaces worked in by SIERRAS CONSTRUCTION’s personnel are non-permit required spaces. If a hazard or potential hazard exist in the confined space, a permit will be required. A permit is written authorization specifying the location and type of work to be done, certifying that all existing hazards have been evaluated by the designated competent person, and that necessary protective measures have been taken to insure the safety of each employee. Project management is responsible for appointing the designated competent person.

3. REQUIREMENTS

A. Non-Permit Confined Space

Non-permit confined space means a confined space that does not contain or have the potential to contain any hazard capable of causing serious harm. These spaces and others may be identified by project management as a permit required confined space, In these instances, SIERRAS CONSTRUCTION will follow permit rules for the confined space.

B. Permit Required Confined Space

1. An Entry Permit shall:

   a. Be completed as far as possible prior to sampling. The person responsible for the confined space entry permit shall know the proper operation and calibration of all equipment to be used.

   b. Be for one shift.

   c. Be updated for each shift with the same requirements.

   d. Be updated with records of air sampling.

2. Compliance:

   a. All SIERRAS CONSTRUCTION employees who enter confined spaces or work in support of a confined space entry shall be trained on all required procedures and ensure that all the requirements have been satisfied and are strictly enforced.

   b. The supervisor responsible for the safe entry, as named on the entry permit, shall evaluate, plan and implement the procedures necessary to safeguard the employees assigned to the job.
c. The designated competent person responsible for safe entry shall be responsible for the issuance of all oxygen and gas detection equipment. Anyone noting a malfunction of any gas detector sampling device shall immediately evacuate all personnel, remove problem equipment from service and notify the designated person.

3. Training shall consist of:

a. Confined space hazard recognition.

b. Respirator training / Breathing apparatus.

c. Powered ventilation equipment use.

d. All rescue and support equipment use.

e. Emergency rescue procedures.

f. Lockout / Tagout, isolation and purging.

g. Air monitoring and gas detection equipment.

h. Personal protective clothing/equipment requirements.

4. Posting:

All confined space entrances are required to be posted. The posting shall include the following information: "Danger! Confined Space, Enter by Permit Only." When, a specific work practice or specific safety equipment is required, a statement shall be added to the warning sign.

5. Safety Equipment:

To enter a confined space, the following shall be available:

a. Oxygen and gas detectors to test for flammable, oxygen deficient and toxic atmospheres.

b. Respiratory, hearing and face protection.

c. Powered ventilation equipment if required to work in the confined space. Ventilation equipment shall be compatible and approved for the work environment.

d. Body protection.

e. Additional safety equipment such as a safety line and full body harness. The standby person shall also wear a full body harness with a safety line attached.

f. A self contained breathing apparatus (SCBA).

g. Radio communication.
6. Entering Confined Spaces:

   a. Isolation - Before entering, isolation procedures shall be completed and verified by SIERRAS CONSTRUCTION's competent person.
   
   b. Testing - Initial testing of the atmosphere shall be performed from outside of the Confined space. When testing indicates the atmosphere is not acceptable for employee entrance, the confined space must be purged and or ventilated.
   
   c. Purging - Purging is adjusting the atmosphere in a confined space to acceptable standard Permissible Exposure Limit (PEL), Lower Exposure Limits (LEL), etc. Purging is accomplished by displacing the atmosphere in the confined space with fluid or vapor (inert gases, water or steam) or by forced air ventilation.
   
   d. Ventilation - Mechanical ventilation shall be provided to maintain the atmosphere to allowable levels. The ventilating equipment shall be located to prevent recirculation of exhausted air or introduction of contaminants from outside of the confined space. Strict control on ignition sources shall be implemented. If the atmosphere cannot be made safe and breathing apparatus must be worn, continuous ventilation will be maintained at all times in an effort to keep the concentration of contaminants as low as possible.
   
   e. Lighting - All lighting equipment shall be grounded. Low voltage, battery powered or ground fault interrupter protected lighting systems shall be used.

7. Standby Rescue Personnel:

   a. Employees shall have no other assigned duties and meet the following training requirements:
      1) First Aid/CPR Trained.
      2) Self-Contained Breathing Apparatus (SCBA) or Cascade System
      3) Emergency Med-Evac Procedures
      4) Monitoring equipment.
   
   b. Personnel shall assure the following equipment is on location and in serviceable condition:
      1) Radio or Telephone communication.
      2) Gas/Oxygen detection equipment.
      3) Fire Extinguisher.
      4) First-Aid Kit/Stretcher.
      5) Required length of life line.
      6) Full Body Safety Harness.
      7) Flashlight.
      8) Self-Contained Breathing Apparatus (SCBA)
      9) Cascade System.
      10) Rescue Tripod.

   c. In the event of an emergency situation, Standby employees will take the following actions:
      1) Call the emergency over the communications system provided.
2) Attempt rescue from outside the confined space.

3) Do not attempt rescue inside the space until assistance is provided.

4) Administer First-Aid.

d. In the event of a difference between SIERRAS CONSTRUCTION's and the Client's entry procedures, the stricter of the two shall apply.

REFERENCES

29 CFR 1916.21
1. SCOPE

Implement procedures for Fire protection and prevention during construction.

2. GENERAL

Project management is responsible for the development of a Fire protection Program to be followed throughout all phases of construction and demolition work to eliminate fire hazards. This program includes the management of waste materials.

3. REQUIREMENTS

A. Protection Plan

1. Site layout with alternative access/egress routes.
2. Emergency phone numbers for nearest fire department.
3. Access to, and location of, visible fire fighting equipment.
4. Inspection and maintenance of fire fighting equipment.
5. Employee training in relating to above.

B. Prevention Plan

1. Regular clean up of all scrap materials and other trash. Rags, waste and combustible/flammable materials must be placed in tightly closed metal containers for disposal.
2. No materials (waste or usable) shall block access ways, exits or stairs.
3. No smoking and open flame signs in storage, painting, or refueling and service areas.
4. Storage tanks to be in lined berms.
5. Paints and similar materials to be stored in closed containers until used and kept in a well ventilated area away from excessive heat. If these materials are located within another building or structure, the structure shall be of either noncombustible construction or combustible construction having a fire resistance of no less than one (1) hour.
6. Open flames or spark producing operations shall not be permitted above or within ten feet of visqueen covered structures.
7. Non compatible materials which may create a fire hazard shall be segregated by a barrier having a fire resistance of at least one (1) hour.
8. Lights and heating units should be clear of combustible materials.

C. Portable Fire Fighting Equipment

1. One fire extinguisher rated 2A per three thousand (3,000) square feet or less per floor. Maximum access distance one hundred (100) feet.
2. At least one fire extinguisher per floor located near stairs.

3. Combustible liquid storage see next subsection.

D. Flammable and Combustible Liquids

1. Definitions and General Requirements:
   a. **Flammable** liquids are those that ignite at a temperature of 100º F or less. Examples are gasoline, lacquer thinners, and MEK. LPG has separate regulations.

   b. **Flammable** liquids storage, handling and use:
      1) Quantities less than one gallon, use original containers or an approved metal safety can.
      2) Quantity greater than one (1) gallon, only use approved metal safety container.
      3) For bulk storage approved containers and approved portable tanks shall be used. See next subsection for more details.

   c. **Combustible** liquids are those that ignite at temperatures greater than 100º F. Examples are diesel, kerosene, lubricants, and most paints.

   d. **Combustible** liquids storage handling and use:
      1) Original storage container may be used or a container labeled in accordance with hazcom standard.
      2) Bulk storage to be in approved containers or original containers. See next subsection for more details.

2. Indoor Storage of Flammable and Combustible Liquids:

   a. No more than twenty-five (25) gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet.

   b. Quantities of flammable and combustible liquid in excess of twenty five (25) gallons shall be stored in an approved cabinet.

   c. No more than sixty (60) gallons of flammable or one hundred and twenty (120) gallons of combustible liquids shall be stored in anyone storage cabinet. No more than three such cabinets may be located in a single storage area.

   d. Flammable and combustible liquids that exceed the permitted quantities for inside storage rooms shall be stored outside.

3. Storage Outside Buildings:

   a. Storage of containers (no more than sixty (60) gallons each) will not exceed one thousand one hundred (1,100) gallons in anyone pile or area. Piles or groups of
containers shall be separated by five (5) foot clearance. Piles or groups of containers shall not be nearer than twenty (20) feet to a building.

b. Within two hundred (200) feet of each pile or group of containers there will be a minimum twelve (12) feet wide access for fire fighting apparatus.

c. Outdoor portable tank storage:
   1) Portable tanks shall be a minimum of twenty (20) feet from any building. Two or more portable tanks grouped together having a combined capacity in excess of two thousand two hundred (2,200) gallons shall be separated by a five (5) foot clear area. Individual portable tanks exceeding one thousand one hundred (1,100) gallons will be separated by a five (5) foot clear area.

   2) Within two hundred (200) feet of each portable tank, there shall be a minimum twelve (12) foot wide access for fire fighting apparatus.

   3) Signs prohibiting smoking open flame or spark producing devices shall be posted on all flammable and combustible liquid storage tanks.

4. Fire Control for Flammable or Combustible Liquid Storage:

   a. At least one portable fire extinguisher having a rating of no less than 20-B shall be located outside of, but not more than ten (10) feet from the door opening into any room used for storage of more than sixty (60) gallons of flammable or combustible liquids.

   b. At least one portable fire extinguisher having a rating of no less than 20-B shall be located not less than twenty (25) feet no more than seventy-five (75) feet from flammable liquid storage areas located outside.

   c. At least one portable fire extinguisher having a rating of no less than 20-C shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

5. Dispensing Liquids:

   a. The transfer of flammable fuels from one container to another shall be done only when containers are interconnected (bonded) to prevent the discharge of static electricity.

   b. The dispensing units shall be protected against collision or other damage.

   c. Dispensing devices and nozzles for flammable liquids shall be of an approved type.

6. Handling Liquids at the Point of Use:

   a. Flammable liquids shall be kept in closed containers when not in use.

   b. Leakage or spillage of flammable or combustible liquids shall be cleaned up immediately and in a safe manner, in accordance to the environmental regulations.

Service and Refueling Areas:
a. **Flammable or combustible** liquids shall be stored in approved closed containers.

b. The dispensing hose shall be an approved type.

c. The dispensing nozzle shall be an approved automatic closing type without a latch open device.

d. All dispensing devices shall have, in the event of emergency, clearly marked and easily accessible switch(es) provided at a location remote from dispensing devices to shut off all power.

e. There will be no smoking, open flames or spark producing devices allowed in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of **flammable or combustible** liquids.

f. Signs prohibiting smoking and open flames shall be posted for **flammables** and **combustibles**.

g. All engines must be shut off during the fueling operation.

h. Each service or fueling area shall be provided with at least one fire extinguisher having a rating of no less than 20-BC located so that the extinguisher will be within seventy five (75) feet of each pump, dispenser, underground fill pipe opening or lubrication service area.

E. Liquefied Petroleum Gas (LP Gas)

1. Dispensing:
   a. Filling of fuel containers for equipment or motor vehicles from bulk storage containers shall be performed no less than ten (10) feet from the nearest masonry-walled building or no less than twenty five (25) feet from the nearest building or other construction and, no less than twenty five (25) feet from any building opening.

   b. Filling of portable containers or containers mounted on skids from storage containers will be performed no less than fifty (50) feet from the nearest building.

2. Containers and regulating equipment installed outside of buildings or structures shall be upright upon firm foundations and firmly secured.

3. Containers and Equipment Used Inside of Buildings or Structures:
   a. Systems utilizing containers having a water capacity greater than two and one half (2-1/2) pounds (nominal one (1) pound LP Gas capacity) shall be equipped with excess flow valves.

   b. Regulators shall be either directly connected to the container valves or to manifolds connected to the container valves.

   c. Valves on containers having water capacity greater than fifty (50) pounds (nominal twenty (20) pounds LP Gas capacity) shall be protected from damage while in use or storage.
d. Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the main burner and pilot in event of flame failure.

e. Containers having a water capacity greater than two and one half (2 1/2) pounds (nominal-one (1) pound LP Gas capacity) connected for use shall stand on a firm level surface and shall be secured in an upright position.

f. The maximum water capacity of individual containers will be two hundred and forty five (245) pounds (nominal one hundred (100) pounds LP Gas capacity)

4. LPG container storage is prohibited within buildings.

F. Temporary Heating Devices

1. Clearance and Mounting:
   a. Temporary heating devices shall be installed to provide clearance around combustible material.

   b. Heaters used in the vicinity on combustible tarpaulins, canvas or similar coverings shall be located at least ten (10) feet from the coverings. The coverings shall be securely fastened to prevent ignition.

   c. When in use, heaters shall be set horizontally level unless otherwise permitted by the manufacturer.

   d. Solid fuel heaters are prohibited.

   e. All boilers, stoves and other temporary heating apparatus shall be installed and operated in accordance with manufacturer specifications and/or recommendations.

   f. When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation.

2. Oil-Fired Heaters:

   a. Flammable liquid-fire heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure.

   b. Heaters which aren’t designed for flue connection shall be equipped with integral tanks having a capacity of not more than two (2) gallons.

   c. Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed or an automatic pump from a supply tank.

   d. Oil- fired salamanders are prohibited in buildings and on scaffolds.

3. LPG Heating Devices:
a. For temporary heating, heaters, (other than integral heater-container units) shall be located at least six (6) feet from any LP Gas container. This shall not prohibit the use of heaters specifically designed for attachment the container or to a supporting standard provided that they are designed and installed to prevent direct or radiant heat application from the heater onto the containers.

b. If two or more heater-container units of either the integral or non-integral type are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least twenty (20) feet.

c. When heaters are connected to containers for use in an unpartitioned area on the same floor, the total-water capacity of containers manifolded together for connection to a heater or heaters shall not be greater than seven hundred and thirty-five (735) pounds (nominal three hundred (300) pounds LP Gas capacity). Such manifolds shall be separated by at least twenty (20) feet.

G. Firewatch

1. General:
   a. Fire watch is the person or persons assigned to watch for fires in the vicinity of welding, cutting, spark producing or similar hot work, where there is a potential for a fire.
   
   b. The person assigned to this duty must be an employee who can remain calm during a crisis; and be aware of the surroundings while standing in one place for long periods of time.
   
   c. The fire watch shall wear a hi-visibility vest for identification, when exposed to Vehicular traffic.

2. Training:
   This training shall cover the following subjects:
   
   a. Fire Extinguishers
   
   b. Fire Hose / Fog Nozzles
   
   c. Covering / Openings
   
   d. Hot Work Permits
   
   e. Fire Hazard Recognition
   
   f. Evacuation Procedures

3. Duties:
   
   a. Assure the fire fighting equipment is in serviceable condition. --
   
   b. If a fire extinguisher is to be used in the performance of their duty, it shall be in position near their person at all times.
   
   c. Hoses, when used, shall be charged and held in hand.
d. Prior to the start of work, the fire watch shall read the Hot Work Permit for any special instructions.

e. Assure that all sewers, drains or equipment where the potential for ignition, and fire from hot slag exists are covered with fire blankets and sandbags in accordance with SIERRAS CONSTRUCTION / client standard operation procedures.

f. Survey the work area and remove or have removed any flammable material not being used for the work operation. The fire watch has the authority to STOP WORK whenever a hazardous situation exists.

g. The fire watch shall not leave the work area unless relieved by their supervisor or designee.

h. In certain situations, or as noted on the Hot Work Permit, the fire watch shall remain in position for thirty (30) minutes after the suspension of work operations.

i. If a fire situation occurs, the fire watch must take immediate action by shouting a verbal alert, and attempt to extinguish or suppress the fire until help arrives. If attempts at extinguishing the fire fail the fire watch shall evacuate the area.

REFERENCES

29 CFR 1926.150 – 155
29 CFR 1910.110
NFPA
1. SCOPE

Implement Hazard warning systems consisting of signs, signals and barricades.

2. GENERAL

Provide consistent means of identifying local or general hazards understandable by all employees, subcontractors and visitors.

3. REQUIREMENTS

A. Signs/Signals

1. Signs when required shall be visible at all times when work is being performed, and shall be removed promptly when the purpose for them no longer exist.

2. Danger signs shall be used only where an immediate hazard exists and have red as the predominating color for the upper panel, black out line on the borders and a white lower panel for additional sign wording.

3. Caution signs shall be used only to warn against potential hazards and have yellow as the predominating color, black upper panel and borders, yellow lettering of "caution" on the black panel, and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording.

4. Exit signs, when required, shall be lettered in legible red letters, not less than six (6) inches high, on a white field and the principal stroke of the letters shall be at least three-fourths inch in width. Safety instruction signs shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

5. Directional signs, other than automotive traffic signs, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.

6. Construction areas shall be posted with legible traffic signs at points of hazard. All traffic control signs or signals shall be normal highway signs or signals.

7. Accident prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment etc. They shall not be used in place of, or as a substitute for, accident prevention signs.

B. Barricades

1. Barricades shall be visible at all times when work is being performed, and shall be removed promptly when the hazard no longer exist.

2. Barricade tape, when used, shall be a minimum of two (2) inches wide and be colored red and black for "danger" and yellow and black for "caution". If timber barricade is used it should be painted with the same colors as barricade tape or the appropriate tape should be affixed to it.
3. Red and black barricade tape shall be used to designate an area of danger. Only the individual(s) who establishes a "danger area" may allow employees to enter. All others shall go around.

4. Yellow and black barricade tape shall be used to designate an area of caution. Employees shall be allowed to move through an area marked with the caution tape but only with knowledge of why the area is marked.

5. Signs should be placed with the barricade tape to identify the hazards.

REFERENCES

OSHA 29 CFR 1926.200
ANSI D6.1-1971
ANSI Z53.1-1.967
1. SCOPE

Establish procedures for the safe handling and storage of materials.

GENERAL

Project management is required to establish a material handling plan. This plan must take into account the weight and size of material, equipment and personnel required, distance of travel, and the stability of working and storage surfaces. Material storage and locations should be designated.

REQUIREMENTS

A. Material Handling - Manual

1. Lift material with your legs, keeping your back straight; do not use your back muscles.

2. Gloves are to be worn when working with sharp, abrasive objects or when splinters are possible.

3. If weight or size is excessive or the object is awkward, get help or consult with your supervisor.

B. Material Handling - Mechanical

1. Only employees trained in rigging shall handle, calculate, and rig loads.

2. Capacity of device (crane, forklift, chain fall, come-a-long) must be known prior to use.

3. Taglines are to be used to control suspended loads and to keep employees away from lifts made by mechanical equipment. Keep hands off loads.

4. Trucks and hauling equipment must not be moved once the tie-downs have been released.

C. Rigging Components

1. Shock Loads:
   
   a. Shock loads should be avoided.

   b. Safety factors are based upon standard normal operations and do not allow for excessive shock loads.

   c. It is the Operator's responsibility to avoid shock loads.

2. Wire Rope and Synthetic Web Slings

   The selection size of slings and chokers is the responsibility of the supervisor of the lifting operation:
a. Slings must be stored off the ground when not being used, preferably on a rack.
b. Wire rope slings should be kept lubricated to avoid rusting.
c. Synthetic web slings should be stored out of direct sun light.
d. Slings that are one and one half (1-1/2) inches in diameter and larger should be proof-tested to double the safe working load before the sling is accepted. This testing should be done by the supplier.
e. Use suitable softeners (wood or rubber) to prevent chokers from slipping where slings go around sharp corners.
f. When lifting two or more bundled pieces that are over twelve (12) feet long in a single lift use two (2) slings suitably separated.
g. Sling angles greater than sixty (60) degrees from the vertical are not recommended.
h. Do not use synthetic web slings in areas of high temperatures or around chemicals that could compromise the integrity of the sling.

3. Turnbuckles:
   a. Inspect for corrosion prior to use.
   b. Do not bend around obstructions, use only in tension.

4. Shackles:
   a. Use only forged alloy steel shackles with the safe working load stamped on their bales.
   b. It is recommended that a shackle one size larger than the sling diameter be used.
   c. Shackles rated at one hundred (100) tons or more must be magnetic-particle tested before each lift.

5. Cable Clips:
   a. U-bolt cable clips must have the U-bolt section on the dead or short end of the rope and the saddle on the live or long end of the rope.
   b. The number and spacing of the clips must be in accordance with a clip chart. These are found in rigging hand books and OSHA (see references). All clips must be drop forged steel.
   c. The clip nuts must be re-tightened after newly installed rope has been in use for an hour and periodically rechecked for tightness.

6. Eye Bolts:

   Manufactured eyebolts used for lifting will only be made from drop forged steel. Field fabricated eye bolts must be designed by a structural engineer.
7. Wedge Sockets:
   a. Wedge sockets must have the live or running end in line with pin hole.
   b. After pulling the wedge tight, at least one cable clip should be installed on the tail.

8. Lifting Lugs:
   Field fabricated lifting lugs must be designed by a structural engineer.

9. Spreader Bars:
   Field fabricated spreader bars must be designed by a structural engineer.

D. Storage of Materials

1. Store material on dunnage or pallets for ease of handling.

2. Material and equipment (pipe, drums, reels, trailers, etc.) must be chocked to prevent movement.

3. Light weight materials with large surface areas must be secured.

REFERENCES

29 CFR 1926.250
29 CFR 1926.251
30 CFR
1. **SCOPE**

Outline the safe use, care and maintenance of hand and power tools.

2. **GENERAL**

All hand and power tools and similar equipment, whether furnished by SIERRAS CONSTRUCTION or the employee, shall be maintained in a safe condition. All hand-held power tools shall be equipped with a constant pressure switch that will shut off the power when the pressure is released. This does not apply to bench mounted tools.

3. **REQUIREMENTS**

**A. Hand Tools**

1. Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung to the point that slippage occurs.

2. Impact tools, such as drift pins, wedges, and chisels, shall be kept free from mushroomed heads.

3. Wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

4. Tools shall not be used beyond their capacity.

5. Hand made extension handles (cheaters) are not to be used.

**B. Power Tools - Electric**

1. Electric power operated tools shall either be of the approved double insulated type or grounded. The use of electric cords for hoisting or lowering tools shall not be permitted.

2. Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Work rests shall be kept at a distance not to exceed one-eighth of an inch from the surface of the wheel.

**C. Fuel Powered Tools**

1. Fuel powered tools shall be stopped while being refueled, serviced, or maintained.

2. If using fuel powered tools in enclosed spaces the confined space standards will apply (Section 13).

**D. Pneumatic Power Tools**

1. Use of Compressed Air:

   a. Except where automatic shutoff valves are used, safety chains, clips, whip-checks or other suitable locking devices shall be used at hose to machines, hose to hose, and hose to connections of high pressure hose lines.
b. At no time shall compressed air be directed towards a person; Compressed air shall not be used for cleaning purposes except where reduced to less than thirty (30) pounds per square inch (psi).

c. The manufacturers’ safe operating pressure for hoses, pipes, valves, filters and other fittings shall not be exceeded.

2. The use of hoses for hoisting or lowering tools shall not be permitted.

3. Safety clips or retainers for tools shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally released.

4. Pneumatic hand tools shall be disconnected from the power source and pressure in hose lines shall be released before any adjustment or repair to the tools are made.

E. Powder-actuated Tools

1. Only employees who have been trained and certified in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool. The powder actuated tool manufacturer representative will normally train employees.

2. The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacture’s recommended procedure.

3. Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not be used until properly repaired.

4. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employee.

F. Abrasive Blasting

1. A competent person will assess what type hazards exist from the surface coating of material to be blasted. From this assessment and additional testing if required the composition and toxicity of the dust from those sources will be determined. From this determination the competent person will decide what respiratory equipment and blasting agents to use to minimize the hazard involved.

2. The concentration of the dust/fumes in the breathing area of the abrasive blasting operator, or any other worker shall be maintained below ten (10) milligrams per cubic meter.

3. Silica sand will not be used when other material is available.

4. The abrasive blast area shall be barricaded for a distance of fifty (50) feet, with signs posted stating, "ABRASIVE BLASTING-DO NOT ENTER".

5. The blast nozzle shall be bonded to prevent build-up of static electricity.
6. Hose couplings shall be made of metal and secured to the outside of the hose to prevent erosion and weakening of the couplings. Nozzle fittings must be made of metal and fit onto the hose externally. A dead man control must be provided either to cut off the air flow, or to signal the pot tender to cut it off. The pot tender shall be available to respond at all times.

7. The blast operator shall be provided with a supplied air hood respirator providing a steady flow of class "D" or better breathing air. Other compressed air may be used if a trap and carbon filter are installed and regularly maintained. A valve shall be installed to reduce the pressure down to requirements of the respirator in use.

8. Blast operators shall be equipped with heavy canvas or leather gloves and aprons, or equivalent protection.

9. Project management may determine that abrasive blasting operations be conducted after normal hours when a minimum number of employees are present in the work area.

10. Aisles and walkways should be kept clear of shot or similar abrasives.

11. All SIERRAS CONSTRUCTION employees involved in abrasive blasting operations shall receive respirator training in compliance with current regulations. Those selected to use the abrasive blasting equipment and material will receive training in its use, maintenance, and hazards involved.

REFERENCES

29 CFR 1910.94
29 CFR 1910.134
1. SCOPE

Delineate the safe use and handling of gas and arc welding and cutting equipment.

2. GENERAL

Employees whose work involves the use of welding and cutting equipment are to be made aware of the hazards: fire damage (property damage), explosive mixtures, asphyxiants, burns (personal injury), toxic fumes are all potential hazards. Training is required to include the safe handling, storing and usage of the equipment.

3. REQUIREMENTS

A. Welding and Cutting - Gas

1. Storage Requirements:
   a. Cylinders shall be kept away from all sources of heat.
   b. Inside of buildings, cylinders shall be stored in a well ventilated, well protected, dry location at least twenty (20) feet from highly combustible materials. Cylinders should be stored in specifically assigned places away from elevators, stairs, gangways, and emergency exits. Assigned storage spaces shall be located where cylinders can not be knocked over or damaged by passing or falling objects or subject to tampering by unauthorized personnel.
   c. Empty cylinders shall have their valves closed, capped and stored separate from full cylinders.
   d. Cylinders shall be stored with the valve end up and secured.
   e. Valve protection caps shall always be in place, hand tight except when cylinders are connected for use.
   f. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary, for short periods of time while cylinders are actually being hoisted or carried.
   g. A fire extinguisher shall be no closer than twenty-five (25) feet but not further than fifty (50) feet from fuel gas storage places.
   h. If storage area is at dock height, appropriate guard, railing and safe access shall be provided.
   i. When cylinders are raised or lowered to another elevation by cranes, a purpose made rack shall be used.

2. Fuel Gas Cylinder Storage Requirements (propane, acetylene, natural gas):
   a. Warning signs shall be in place and shall read, "Danger – No Smoking, Matches, Open Lights or Flames".
   b. Inside a building, cylinders, except those in actual use or attached for use, shall be limited to a total gas capacity of two thousand (2,000) cubic feet. Liquefied Petroleum Gas storage is prohibited within buildings.

3. Oxygen Storage Requirements:
a. Storage of oxygen cylinders shall be separated from fuel or gas cylinders or combustible materials (especially oil or grease), a minimum of twenty (20) feet or by a noncombustible barrier at least five (5) feet high having a fire-resistant rating of at least half (1/2) hour.

b. Warning signs shall be in place and shall read, "Danger - No Smoking, Matches, Open Lights; or Flames".

4. Fuel Gas and Oxygen Usage:

a. Before connecting regulators to cylinders, the valve must be carefully cracked open to low out any foreign particles. Then the regulator (in the closed position) may be connected to the cylinder. Stand to one side of the gauge and open the cylinder valve slowly.

b. Regulator valves on fuel gas cylinders should be opened a quarter turn only. Regulator valves on oxygen cylinders must be opened all the way.

c. Valve wrenches must be kept in place during use.

d. Fifteen (15) psi should not be exceeded on the torch side of the gauge when using acetylene.

e. When lighting a torch, open the fuel gas valve on the torch before opening the oxygen valve. Use an approved spark lighter. Do not use matches or cigarettes to light a torch.

f. All compressed gas cylinders should be kept in bottle carts or racks when transported or in use.

g. All cutting torch sets must be broken down at the end of the shift with regulators removed and protective caps screwed on hand tight.

h. Compressed gas cylinders must be tied off vertically to an adequate support while in storage, transit or use.

i. Oil and grease must be kept away from oxygen regulators, hose and fittings.

j. Compressed gases shall not be used to clean off clothing, blow out anchor holes, or to clean work areas.

k. All hoses, gauges and torches must be inspected prior to use.

l. Cylinders, regulators and hoses are to be placed where they are not exposed to sparks and slag.

m. Anti-flash back arresters must be installed on all regulators or built into the regulator.

n. Compressed gas cylinders shall not be taken into confined spaces.

o. Torches, hoses and regulators shall not be left in a confined space when not in use.

p. A fire extinguisher will be in close proximity to all welding and cutting operations.

q. Ventilation will be provided for welding and cutting operations in enclosed spaces.
B. Welding and Cutting - Arc

1. Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a adequate capacity to safely handle the maximum rated current required by the electrodes shall be used.

2. All ground connections for electric welding shall be inspected to be mechanically strong and electrically effective.

3. When electrode holders are left unattended, the electrode must be removed.

4. Spent welding rods shall be placed in a suitable container.

5. Cable in poor repair shall not be used.

6. When it becomes necessary to connect or splice lengths of cable to one another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. Any exposed metal parts shall be insulated.

7. The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current.

8. Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return.

9. When the operator has occasion to stop or leave the work for any appreciable length of time, or when the machine is to be moved, the power supply shall be turned off.

10. Prior to arc welding and cutting, the work area must be inspected to ensure that sparks or molten metal will not fall on combustible materials or other employees.

11. Suitable fire extinguishing equipment shall be immediately available at all welding and cutting locations.

12. Employees engaged in arc welding and cutting shall wear an approved hood with hard hat, proper protective gloves and long sleeves or welders sleeves.

13. In poorly ventilated areas, adequate ventilation or approved respiratory equipment must be used.

14. Safety shields or barricades shall be placed around welding and cutting where needed to protect others from direct rays of the electric arc.

15. A welder, unless working behind a shield or barricade, shall not strike an arc until nearby workers are given ample warning.

REFERENCES

OSHA
29CFR1916.350
29CFR 1926.351
30CFR
1. **SCOPE**

Establish the requirements to protect employees from hazards associated with electric shock, electrical generated explosions, fire, and heat.

2. **GENERAL**

The protection of employees in electrical operations including grounding, bonding, battery charging rooms, assured grounding program, cadwelding, temporary lighting, inspection and maintenance requirements.

3. **REQUIREMENTS**

A. Protection of Employees

1. Employees shall not be permitted to work in proximity of any part of an electrical circuit that may cause electrical shock when contacted. Employees shall be protected against electric shock by de-energizing the circuit and grounding it or by guarding it with an effective means of insulation or other protection.

2. Whenever possible, equipment will be locked, and tagged out of service before any work is to be performed on any circuit. It is recognized that, it may be necessary to make tests on energized equipment or wiring.

Prior to beginning work:

   a. Identify the circuit to be worked on or tested.
   b. Use test leads and equipment listed for the voltages used.
   c. Voltages of six hundred (600) or less require the employee to:
      1. Use leather gloves or wiremen rubber gloves rated at one thousand (1000) volts, while testing.
      2. Use of a buddy as a safety person is encouraged.
   d. Voltages in excess of six hundred (600) volts nominal between phases:
      1. Employee shall use equipment listed and rated for the voltages involved.
      2. Rubber gloves tested for at least twenty thousand (20,000) volts shall be worn while making measurements. Use of the rubber glove without the leather protector is forbidden.
      3. All testing procedures must be approved by the Electrical Superintendent or other responsible supervisor. The procedures must be understood by all those concerned before work proceeds.
      4. The buddy system is to be used at all times while working with high voltages.
      5. "HOT" line tools are to be used by employees who have been trained in the proper use of them.
      6. Wear approved face shield in addition to safety glasses.
      7. Shall not wear rings, watches or other jewelry while testing.
3. Workspace around Equipment:
   Sufficient space shall be provided and maintained in the area of electrical equipment to permit safe operation and maintenance of such equipment.

4. Lockout and Tagging of Circuits (see procedure on ELECTRICAL II):
   a. Equipment or circuits that are de-energized shall be rendered inoperative and have tags and locks/lockout devices attached at all points where such equipment or circuits can be energized.
   b. During the start-up phase, controls that are to be deactivated during the course of work on energized or de-energized equipment or circuits shall be tagged.

5. Ground Fault Circuit Interrupter (GFCI):
   a. All one hundred and twenty five (125) volt, single phase, fifteen (1.5), twenty (20) and thirty (30) Amp receptacle outlets used by employees shall have GFCI protection during construction.
   b. GFCI's shall be inspected, tested and the results recorded monthly.

6. Construction Site:
   Every precaution shall be taken to make any necessary open wiring inaccessible to unauthorized personnel.

B. Grounding and Bonding

1. Portable and/or Cord and Plug Connected Equipment:
   a. The noncurrent-carrying metal parts of portable and/or plug-connected equipment shall be grounded.
   b. Portable tools and appliances protected by an approved system of double insulation or its equivalent need not to be grounded. Where such an approved is used, the equipment shall be marked accordingly.

2. Fixed Equipment:
   Exposed noncurrent-carrying metal parts of fixed electrical equipment including motors, generators, frames and tracks of electrically operated cranes, electrically driven machinery, etc., shall be grounded.

3. Extension Cords:
   Extension cords used with portable electric tools and appliances shall be of three-wire type and shall be maintained in good condition in accordance with the Assured Grounding Program.

4. Bonding:
   a. Conductors used for bonding and grounding stationary and moveable equipment shall be of ample size to carry the anticipated current.
b. A secure and positive metal-to-metal contact, shall be made when attaching bonding and grounding clamps or clips.
c. Tags shall be plainly labeled to identify the equipment circuits being worked on.

5. Temporary Wiring:

All temporary wiring shall be effectively grounded.

C. Temporary Lighting

1. Temporary lights shall be equipped with guards to prevent accidental contact with the bulb. Guards are not required when the construction of the reflector is such that the bulb is deeply recessed.
2. Temporary lights shall be equipped with heavy duty electric cords with connection and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this type of suspension. Splices shall have insulation equal to, or greater than that of the cable. Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.
3. Portable electric lighting used in moist and/or other hazardous locations, for example; drums, tanks and vessels shall be operated at a maximum of twelve (12) volts.

D. Equipment Installation and Maintenance

1. Flexible cable and Cords:
   a. Cable passing through work areas shall be covered or elevated seven (7) feet to protect it from damage which would create a hazard to personnel.
   b. Worn or frayed electric cables shall be removed from service,
   c. Extension cords shall be protected against accidental damage caused by traffic, sharp corners or projections and pinching in doors or elsewhere.
   d. Extension cords shall not be fastened with metal staples, hung from nails or suspended by wire or any other conductive material. Insulated staples or plastic ties from nails are acceptable.
   f. Cables passing through or into junction boxes, switch gear, etc. shall be protected against physical damage by grommets, box connectors, etc.
2. Switches, Circuit Breakers and Disconnecting Means:
   a. All switches, circuit breakers, disconnecting means, feederlines and branch circuits shall be legibly marked to indicate their purpose and voltage unless located and arranged so the purpose is evident.
   b. Boxes and disconnecting means installed in a damp or wet location shall be waterproof to the extent that water can not enter or accumulate.
E. Battery Rooms and Battery Charging

1. General Requirements:
   a. Batteries of the non-sealed type shall be located in enclosures with outside vents or in well ventilated rooms so arranged as to prevent the escape of fumes, gases or electrolyte spray into other areas.
   b. Ventilation shall be provided to ensure diffusion of the gases from the battery to prevent the accumulation of an explosive mixture.
   c. Proper personal protective; equipment (PPE) is required; face shields, aprons and rubber gloves shall be provided for workers handling acid or batteries.
   d. Facilities for quick drenching of the eyes and body (safety showers and eye washes) shall be provided within twenty-five (25) feet of the work area for emergency use.

2. Charging:
   a. Battery charging installations shall be located in areas designated for that purpose.
   b. When charging batteries, the vent caps shall be kept in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning.

F. Assured Grounding Program

In addition to the GFCI protection, the following Assured Equipment Grounding Conductor Program shall be established on all projects.

1. General:
   a. The employee assigned to carry out this program will be the electrical superintendent, electrical foreman, or their designated competent person.
   b. This program is required on all Sierras Construction projects regardless of client requirements.
   c. This program and the monthly inspection log must remain on the project and be available during inspections.

2. Responsibility
   a. Each employee (tool room and equipment user) shall be trained to visually check daily for external damage to, or defects of, each piece of electrical equipment before it is used: Training may be included as part of the weekly site safety meeting. Training must be documented.
   b. The trained employee shall check male and female plug ends to make sure there is a tight connection with no exposed wires, no breaks in the insulation, and that the grounding connection of the plug is operable.
   c. The designated competent person shall test each piece of portable electric equipment, tool, and extension cord for proper grounding, electrical continuity, and polarity, at the beginning of each month.

3. Assured Grounding Program Log
An assured grounding log shall be kept on each project. The log will list all equipment, tools and cords that must be inspected along with the results of the inspection.

4. Color Coding

If the electrical equipment, tool or cord passes the required inspection, colored tape shall be attached to the power cord in accordance with the Sierras Construction Assured Grounding Program and the Color Code shown in the appropriate form.

G. Cadwelding

Only competent persons approved by project management will perform cadwelding. The competent person shall review this procedure prior to conducting a cadweld. A hot work permit may be required on some projects. In addition to the standard personal protective equipment, a face shield and leather gloves are required: Flame retardant clothing is recommended.

Procedure:

1. Dry the connection and the mold with a torch.
2. Clean dried end with a brush to remove all dirt and oxides.
3. When welding to a steel surface use a rasp, or an approved grinding wheel to remove paint, rust and mill scale from area to be welded ensuring that bright metal is showing.
4. Position mold over connector with conductor ends under center of the tap hole, gap distance, if required; as noted on mold tabs.
5. Lock mold handles.
6. Insert round metal disk in bottom of crucible (ensure it covers tap hole)
7. Dump in weld material, ensuring proper amount of shot is used and mold is sealed properly.
8. Sprinkle starting material on mold lip and over weld material.
10. Prior to igniting the powder in the mold, the competent person will clear the area of all non-essential personnel to prevent inhalation of toxic fumes. Ensure the surplus powder is removed from the immediate area.
11. Ignite with a flint igniter (Do not use matches, cigarettes or torch).
12. Wait ten (10) to fifteen (15) seconds after burn is completed, then open mold and remove from finished connection.
13. Remove slag and dust with a clean rag, mold cleaning tool, or bristle brush. Do not use a wire brush.
14. Discard mold if excessive leakage occurs around the mold or if mold disk seat is worn or chipped.

REFERENCES

29 CFR 1926-402 - 408
29 CFR 1926-402 - 416
29 CFR 1926-402 – 417
29 CFR 1926-402 - 441
1. SCOPE

Establish a procedure necessary to identify the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing, or installation of devices or parts related to or in close proximity of machines or equipment.

2. GENERAL

This procedure shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any installation, servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

3. REQUIREMENTS

Protect employees by following the corresponding procedure as outlined on Sierras Construction's form as follows:

See Form next Page.
Lockout Procedure

Purpose

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing, or installation of devices or parts related to or in close proximity of machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any installation, servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Compliance With This Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance, or installation of devices or parts related to or in close proximity to the referenced machine, shall not attempt to start, energize, or use that machine or equipment.

Sequence of Lockout

(1) Notify all affected employees that servicing, maintenance or other type of work is required on a machine or equipment or close to it and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.
(2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

Type(s) and magnitude(s) of energy, its hazards and the methods to control the energy.

(3) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.).

Type(s) and location(s) of machine or equipment operating controls.

(4) De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

Type(s) and location(s) of energy isolating devices.

(5) Lock out the energy isolating device(s) with assigned individual lock(s).

(6) Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

Type(s) of stored energy – methods to dissipate or restrain.

(7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.
Caution: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

Method of verifying the isolation of the equipment.

(8) The machine or equipment is now locked out.

"Restoring Equipment to Service." When the servicing, maintenance or work close to the machine is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

(1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

(2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

(3) Verify that the controls are in neutral.

(4) Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require reenergization of the machine before safe removal.

(5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for used.