TABLE OF CONTENTS

PAGE

POLICIES

Policy Statement

It is the policy of Graves Construction Inc. to provide all employees with a safe and healthful work environment as free as possible from recognized hazards. It is also policy to maintain and actively support a comprehensive employee safety and health program. Graves Construction Inc. has reached a high level of safety consciousness and is proud of its achievement in providing state-of-the-art solutions and techniques in incident prevention. Our goal is to not only maintain our status but to continue to improve in incident prevention.

Objectives

Major objectives of this safety and health program are:

- Protect people (employee and others), property, and the environment from potential hazards.
- Provide a uniform policy of safety management consistent with the requirements of governmental safety, health, and environmental regulations.
- Establish and maintain an effective safety and health program involving all levels of the organization including managers, supervisors, and employees.
- Cooperate and assist clients, customers, and others involved in the work area to maintain a safe and healthful workplace.

Responsibilities

Individual responsibilities are listed below, but all individuals, labor and management alike, shall work together in a cooperative effort to eliminate the hazards that cause incidents:

- Project Manager--The Project Managers' commitment and active support is vital to the success of the safety and health program. The Project Managers shall demonstrate through their active day-to-day involvement in safety and health that they are interested in and committed to incident prevention. The Project Manager is responsible for implementing the safety and health program, and shall ensure that appropriate personnel and equipment are provided on the site to meet the goals and expectations outlined in the Graves Construction Inc. Safety and Health Program Manual. The Project Manager shall meet with the Manager of Safety and Health before job startup to discuss safety and health issues. During this meeting, provisions shall be made for adequate safety supplies and staffing for the project. The Program Checklist shall be used to help in this task (Appendix A-1).

- Supervisor--Supervisors are to make safety and health a part of all jobs and insist that jobs are done correctly and safely the first time and each time after that. Supervisors are to ensure that employees are properly trained and have the appropriate equipment to do the job safely. They must also consult with employees and other members of the staff about potential safety and health problems and ask for assistance, suggestions, and opinions concerning control measures. Supervisors are also responsible for the following:

    - As a primary objective, plan each day's work operations to prevent incidents and injuries.

    - Provide the employee with the time, material, equipment, and training necessary to carry out the work plan.

    - Be receptive and act on employees' safety and health concerns. Resolve all safety issues within the company hazard correction framework.

    - Encourage employee participation in the identification and correction of safety and health issues.

    - Communicate the status of all aspects of the project safety and health program to each employee.

    - Ensure that all employees understand and can carry out company emergency procedures.

- Employees--Once employees have been properly trained and are provided with adequate surrounding and tools to perform their jobs, they must follow the established safety rules and procedures. Since job site conditions are constantly changing, each employee must remain alert to recognize potentially hazardous situations and take necessary control measures to prevent incidents before and during their job assignments. If a job cannot be performed safely, it must not be done until it can be done safely. Additional responsibilities include:

    - Make every effort to familiarize yourself with and comply with all company safety and health requirements.

    - Complete the Safety and Health Test and discuss any items missed.

    - Fill out the form documenting that the employee has received a copy of the Employee Safety Manual.

    - Implement supervisor's work plan and identify and correct any unforeseen hazards.

    - Make every effort to correct and report all hazards that could cause incidents or injuries within the company hazard correction framework.

    - Express freely any suggestions or ideas to improve the project safety and health program.

- Participate in project Training Programs' Safety Task Assignment Meetings, as well as required training as deemed necessary by the Project Manager.

- Manager of Safety and Health is responsible for making the decision on how to staff the project regarding a full-time safety and health representative whose full duty is the administration of the safety and health program. Since all projects may not require these services full-time, the Manager of Safety and Health, will decide who will be responsible for part-time safety responsibilities on the particular site. The person designated will be required to perform safety functions, conduct incident investigations, compile statistics, perform audits, generate safety reports, etc.

  The Manager of Safety and Health will meet with the Project Manager prior to the start of the job to discuss safety and health issues. During the meeting, the two individuals will ensure arrangements are made to account for local medical services, arrange for proper personal protective equipment, and adequate and qualified safety staffing, discuss and plan contingency and emergency procedures, etc.

Graves Construction Inc.-Client Communications

- Before mobilization on the job site, Graves Construction Inc. will develop a site-specific safety plan. This will be done by identifying the hazards associated with the scope of work, and planning systems to mitigate these hazards:

- As part of the site safety plan, lines of communication between Graves Construction Inc. and the client must be established. By establishing the communication before the project mobilization, future problems may be avoided. A communication plan should identify:

  - The Graves Construction Inc. contact if the client has a safety concern.

  - The client contact if Graves Construction Inc. has a safety concern.

  - The Graves Construction Inc. and client contact in the event of a plant or work site evacuation.

  - The time and location of regularly scheduled meetings between Graves Construction Inc. and the client to discuss safety.

- Prior to the beginning of construction, Graves Construction Inc. job site management and the client should meet to finalize the safety plan and address specific safety concerns. At this time, solutions to unusual safety concerns or hazards should be discussed.

Safety Policy for Subcontractors

Each employer on a job site is responsible for the health and safety of its workers. Subcontractors are obligated to comply with all federal, state, and local rules and regulations concerning safety and health and are to develop specific safety and health programs that

either meet or exceed the requirements set forth in this manual. Subcontractors must also tailor programs to meet specific requirements that the Owner deems necessary. The following general safety rules will also be observed:

- Site supervisors shall actively participate in the safety and health programs and attend such activities as safety meetings, inspections, etc. Each subcontractor shall designate a qualified site safety representative whose duty will be to monitor site safety functions. Each week, a Subcontractor Safety Meeting will be held; all subcontractors shall be present.

- All subcontractors shall hold weekly “tool-box” and daily safety task assignment (STA) meetings with their workers. “Tool-box” and STA meeting minutes shall be kept and forwarded to the Graves Construction Inc. site safety representative.

- Each subcontractor employee must attend an orientation program that outlines and introduces them to the site, specific safety rules and regulations, and other indoctrination procedures as deemed necessary by Graves Construction Inc.

- Subcontractors shall properly train and inform their employees on the use and location of emergency equipment as well as make them aware of emergency procedures such as first aid, ambulance, and fire calls.

- Subcontractors shall conduct daily inspections of their job areas to detect problems, correct hazardous conditions, enforce rule violations, and abate other hazardous safety and health issues as deemed necessary by Graves Construction Inc.

- Subcontractors shall supply their workers and ensure the use of personal protective equipment as required by local laws, regulations, codes, and Graves Construction Inc.

- The subcontractor site supervisor shall give his current address and telephone number to the project manager so that he can be contacted after hours in case of emergency.

Job Hazard Analysis (JHA) Policy

- Construction is a dynamic process; it is ever changing in physical and environmental forms until the construction process is completed.

- The purpose of a job hazard analysis is to develop a preliminary hazard analysis on work operations as to their potential for injury, or property damage, or both. Once potential hazards have been identified, procedures can be developed to eliminate or mitigate their potential for occurrence.

- Direct benefits of the job hazard analysis are as follows:

    - Potential for injury or property damage eliminated/mitigated.

    - Identifies hazards.

- Improves safety.
- Defines job procedures.
- Provides training.
- Increases awareness.
- Provides improvement in job methods.

- During the planning stages of the project work, activities are flagged that require job hazard analysis. Further work operations requiring job hazard analysis may be identified by weekly walk arounds, safety meetings, or safety committee meetings.

- The below listed personnel shall be assembled to develop a job hazard analysis for each identified work operation:
  - Graves Construction Inc. site safety representative.
  - Project Manager.
  - Foreman.
  - Employee representative.
  - Safety committee representative.
  - Subcontractor representative(s).
  - Owner representative.

- Once a work operation has been identified and the above referenced personnel have prepared the job hazard analysis, the following shall take place:
  - Affected employees shall be trained using the JHA as a base document.
  - Once the training is complete and all provisions of the JHA have been met, the work can be performed.

- The job hazard analysis shall be constructed by using the Graves Construction Inc. Job Hazard Analysis Form (Appendix A-2).

Inspections and Abatement of Hazards

- Formal safety and health inspections shall be conducted daily by supervisors, safety representatives, and employees to detect and correct safety problems, and potential safety problems before they turn into incidents, injuries, and/or illnesses. Informal safety and health inspections are to be conducted continuously by

managers, supervisors, and employees as they perform their assignments. Thus, jobs are to be inspected before, during, and after they are performed to help ensure they are being performed safely. Daily Work Area Inspection Reports are to be filled out by foremen/supervisors and returned to the site safety representative at the end of each day (Appendix A-3).

- Formal copies of inspection reports will be produced each week by the site safety representative and forwarded to the Project Manager. The inspection report will identify areas that need attention and will assign responsible parties with the task of abating the hazard. An abatement period will also be given. The responsible party shall abate the hazard in the abatement period given, or suggest to the safety representative alternative methods of performing the task. If there is disagreement between the safety representative, responsible party, and Project Manager and an agreement cannot be reached onsite, the Manager of Safety and Health will be contacted to settle the matter.

- The Manager of Safety and Health or his designee, will periodically visit the job site to audit and review the effectiveness of the safety and health program.

SUBSTATION OUTAGE

- Before outage, a Substation Outage Plan must be completed and submitted for approval by the project Field Manager or his designee (Appendix A-4).

- All employees involved in the grounding process must use appropriate Personal Protective Equipment (PPE) as listed below.

    1. Standard PPE (hardhat, safety glasses, etc.)
    2. Hot work gloves with leather shells.
    3. Insulated overshoes.
    4. Flame retardant clothing (where required by client).
    5. Hot stick within calibration date.
    6. Voltage tester (fuzzer).

- After grounds are applied, they must be “caution” taped off so if they become energized no one will come in contact with the ground.

Grounding Procedure

- The following procedure must be followed when applying grounds. (See Appendix F).

Enforcement Policy

Enforcement is a vital tool that must be used in a successful safety and health program. First line supervisors are required to issue violations to personnel under their direction when violations take place. Project management and onsite safety and health representatives also have the authority and responsibility to write violations. It is the Project Manager’s responsibility to ensure that enforcement procedures are being utilized and followed on a consistent and fair basis:

- Employees must follow the established safety rules, regulations, policies, and procedures. Failure to follow these rules and regulations will result in disciplinary action and/or discharge. Rules and procedures pertaining to employee safety and health are the most important rules and procedures at the workplace and are enforced by supervisors to protect Graves Construction Inc.’s most important resource: employees.

- All employees are required to abide by the provisions of the safety and health program. Violations or disregard of these requirements or other safety instructions shall be grounds for the following disciplinary procedures:

    - Any supervisor who willfully, knowingly, or negligently permits a violation of the safety and health program, any governmental safety and health regulations, laws, rules, or instructions that result, or could result, in serious personal injury, property damage, damage to company equipment, or safety citations is personally accountable to top management for his/her actions. Supervisors are also responsible for their employees’ actions and may face disciplinary actions when their employees violate the project safety and health

rules. Supervisors will be reprimanded in accordance with the following disciplinary procedures outlined below.

- Any non-supervisory employee who knowingly violates the safety and health program, any governmental safety and health regulations, laws, rules, or instructions that result, or could result, in serious personal injury, property damage, damage to company equipment, or safety citations shall be subject to disciplinary action appropriate for the severity of the violation. The following shall be considered minimums:

  (1) First instance: Verbal warning.

  (2) Second instance: Written warning.

  (3) Third instance: 1 to 3 days off.

  (4) Fourth instance: Discharge.

- The foregoing disciplinary procedures are the minimum procedures to be followed in this enforcement policy. The severity of the violation may be grounds for more severe disciplinary action, such as longer suspension or immediate discharge. The "Employee Notice of Violation" form shall be used for this purpose (Appendix A-5).

- When a work operation is being performed and does not meet Graves Construction Inc., governmental, or Owner rules or regulations, management personnel, including the site safety representative, have the authority to **STOP WORK.** This **STOP WORK** order shall be adhered to and work shall cease until the hazard(s) have been abated to the satisfaction of the site safety representative. The individual(s) and supervisor(s) involved in the work operation shall be made aware of the violation and shall be involved in the abatement process. If the violation is willful or flagrant, disciplinary actions shall be utilized.

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PROGRAM ELEMENTS

Education and Training

- All GCI Construction Managers will complete the OSHA 10 hour class.

- Before assigning an employee to work on a specific assignment or project, the employee should be instructed on the safety and health hazards associated with the assignment or project and the proper procedures to be used to avoid the hazards. The Project Manager is responsible for ensuring that all required training is provided. Prior to the start of a job, the Project Manager, with the assistance of an Graves Construction Inc. safety and health specialist, shall identify areas where specific training is needed and shall make arrangements with the Manager of Safety and Health to provide a qualified trainer or trainers for this purpose.

- At least one employee on the job site will have current CPR/First Aid training.

- OSHA mandates specific training requirements. It is the Project Manager's responsibility to ensure an employee receives the required training applicable to his work assignment. The following is a list of OSHA mandated training requirements.

- All standards are referenced from 29 CFR Part 1926:

    - .20 (4) General Safety and Health Provisions—Operating equipment or machinery.

    - .21 (B) (2) through (6) General—Recognition and avoidance of unsafe conditions. Handling of poisons, caustics, and other harmful substances. Avoiding injuries associated with harmful plants or animals. Safe handling of flammable liquids, gases, or toxic materials. Safe procedures for entering confined or enclosed spaces.

    - .50 (c) Medical Services and First Aid—Services and personnel to administer medical/first aid care onsite.

    - .53 (b) Ionizing Radiation—Competent persons performing work that involves radioactive materials and X-rays.

    - .54 (a) (b) Non-ionizing Radiation—Qualified people assigned to operate laser equipment.

    - .55 (b) Gases, Vapors, Fumes, Dusts, and Mists—Monitoring, administrative controls, PPE, and respirator use when dealing with these substances.

    - .1101 Asbestos, Tremolit, Anthophylite, Actinolite—Engineering control, work practices, and PPE requirements when working with materials containing asbestos.

- .59 Hazard Communication—Training, identifying, informing, and protection procedures used when dealing with hazardous chemicals in the work area.

- .101 (b) Hearing Protection-Ear protection devices shall be fitted or determined individually by a competent person.

- .103 (c) (1) Respiratory Protection (Selection, Issuance, Use and Care of Respirators)—Instructions on limitations and uses of equipment for both IDLH and normal use.

- .150 (a) Fire Protection (General Requirements)—As warranted by the project; the use of fire brigades.

- .150 (c) (1) (viii) Portable Fire Extinguishers—Inspection and maintenance in accordance with the following ANSI Standard 10A-1970 items:

  (1) 1110—The owner or occupant of a property in which fire extinguishers are located has an obligation for the care and use of these extinguishers at all times. By doing so, he is contributing to the protection of life and property. The nameplate(s) and instruction manual should be read and thoroughly understood by all persons who may be expected to use extinguishers.

  (2) 1120—To discharge this obligation, he should give proper attention to the inspection, maintenance, and recharging of this fire protection equipment. He should also train his personnel in the correct use of fire extinguishers on the different types of fires that may occur on his property.

  (3) 3020—Persons responsible for performing maintenance operations come from three major groups:
  Trained industrial safety or maintenance personnel.
  Extinguisher service agencies.
  Individual owners (e.g., self employed…).

- .201 (a) (2) Signaling (Flagmen)—Signaling directions by flagmen shall conform to ANSI D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways.

- .302 (e) (1) Powder Operated Hand Tools (Powder Actuated Tools)—Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate the powder actuated tool.

- .304 (f) Woodworking Tools (Other Requirements)—All woodworking tools and machinery shall meet the requirements of ANSI 01.1-1961, Safety Code for Woodworking Machinery:

  (1) From ANSI Standard 01.1-1961 9.7 Selection and Training of Operators—Before a worker is permitted to operate any woodworking machine, he shall receive instructions in the hazards of the machine and the safe method of its operation.

- .350 (d) Gas Welding and Cutting (Use of Fuel Gas)—The employer shall thoroughly instruct employees in the safe use of fuel gas.

- .351 (d) (1) through (5) Arc Welding and Cutting (Operating Instructions)--Employers shall instruct employees in the safe means of arc welding and cutting.

- .400 (h) (3) (ii) Ground Fault Protection—Designate one or more competent persons to identify hazards and give them authority to correct them.

- .417 (a) (b) (c) Lockout and Tagout of Circuits—Employees involved in the energy control program must be given training on the procedures utilized for employee protection.

- .451 (a) (3) Scaffolding—No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons.

- .550 (a) (1) (5) and (6) Cranes and Derricks—Employers shall comply with manufacturer's specifications. A competent person shall inspect the equipment before, during, and after use. Must keep records of annual inspection that are performed by the proper authority.

- .552 (a) (1) Material Hoists, Personnel Hoists, and Elevators—Employer shall comply with the manufacturer's specifications and limitations.

- .602 (c) (1) (vi) Material Handling Equipment—All industrial tricks must be used in accordance with ANSI B56.1-1969, Safety Standards for Powered Industrial Trucks. Operators shall be trained in the safe operation of the piece of equipment.

- .604 (a) (1) Site Clearing—Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

- .650 (l) General Protection Requirements (Excavations, Trenching, and Shoring)—Daily inspections of excavations shall be made by a competent person. If evidence of possible cave-ins or slides is apparent, all work in the excavation shall cease until the necessary precautions have been taken to safeguard employees.

- .701 (a) (4) Forms and Shoring—Imposition of any construction loads on the partially completed structure shall not be permitted unless such loading has been considered in the design and approved by the engineer-architect.

- .752 (d) (4) Bolting, Riveting, Fitting-Up, and Plumbing-Up—Plumbing-up guys shall be removed only under the supervision of a competent person.

- .800 (c) (2) (iii) and (iv) Tunnels and Shafts (Air Quality and Ventilation)—Competent person shall check affected areas for flammable gas before power is restored and work resumed. When fans have been shut down, no

employee is to enter before they are restarted and the environment declared safe.

- .800 (e) (1) (xiii) Fire Prevention and Control—Rescue teams made up of five individuals that have been trained in rescue operation, the use of breathing equipment, and knowledgeable in fire fighting techniques.

- 1926.800 (k) (1) Haulage—Equipment that is to be used during a shift shall be inspected by a competent person each shift. Equipment defects shall be corrected.

- .803 (a) (1) and (2) Compressed Air—There shall be a competent person designated by the employer who is familiar with compressed air and its aspects.

- .850 (a) Preparatory Operations—Prior to starting demolition operations, an engineering survey shall be made that accounts for the stability of the structure and possible effects on adjacent structures or properties.

- .852 (c) Chutes—A substantial gate shall be installed in each chute at or near the discharge end. A competent person shall be assigned to control the operation of the gate, and the backing and loading of trucks.

- .859 (g) Mechanical Demolition—During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material.

- .900 (a) General Provisions (Blasting and Use of Explosives)—The employer shall permit only authorized and qualified persons to handle and use explosives.

- .900 (k) (3) (I) The prominent display of adequate signs and warning against the use of mobile radio transmitters on all roads within 1,000 feet of blasting operations.

- .901 (c) (d) and (e) Blaster Qualification—A blaster shall be qualified, by reason of training, knowledge, or experience, in the field of transporting, storing, handling, and use of explosives, and have a working knowledge of state and local laws that pertain to explosives. Blasters shall be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.

- All employee training shall be documented. Included in the documentation should be a description of the items covered in the training session, the length of the training session, the name and job title of the instructor, and an attendance roster signed by each employee receiving the training.

Safety Orientation

- In addition to OSHA required training programs, all newly hired employees, regardless of their position, are required to attend a safety orientation prior to beginning their duties. The training is to include applicable safety videos, walk around orientation to the project and hazards, indoctrination to the Graves Construction Inc. Safety and Health Program, review of specific owner requirements, job site policies, and other topics indicated by project conditions.

- All new hires shall display colored tape (each project will designate the appropriate color) on their hard hat the first 30 days of employment. By identifying new hires, others more familiar with the project safety requirements, can assist and help the new workers in expediting their indoctrination in the Graves Construction Inc. safety and health program and its requirements.

- The new hire safety orientation shall include, but not be limited to, the following topics when applicable to the scope of work:

    - Employer/employee responsibilities under OSHA.
    - Procedures for reporting and correcting unsafe conditions and practices.
    - Job hazard analysis procedures.
    - Eye, head, hearing, and foot protection requirements.
    - Safe lifting procedures – back injury prevention.
    - Respiratory protection requirements.
    - Fall protection program requirements.
    - Scaffolding and scaffold tag requirements.
    - Signs, barricades and flagging procedures, and responsibilities.
    - Perimeter and open hold guarding requirements.
    - Techniques to avoid slips, trips, and falls.
    - Housekeeping and orderliness requirements.
    - Fire protection and hot-work permits and procedures.
    - Company vehicle and seat belt use requirements.
    - First-aid treatment locations and responsible parties.

- Incident reporting requirements.
- Construction emergency action plans and evacuation routes.
- Trenching and excavation requirements.
- Confined space entry procedures and permits.
- Safe tunneling and blasting procedures.
- Material handling, rigging procedures, and crane safety.
- Electrical safety including GFCI use and inspection.
- Safe clearance procedures (lockout/tagout, overhead power lines).
- Hazard communication and MSDS log locations.
- Special project/Owner requirements and procedures.

- In addition to the above referenced presentation, the following shall be discussed:
  - Graves Construction Inc. Commitment to Safety—Safety shall not be sacrificed for production; therefore, every reasonable effort will be made to ensure that employees can accomplish the safe completion of assigned tasks.
  - Employee Safety Responsibilities—The ultimate success of a safety and health program depends upon the full cooperation of each individual employee. Employees shall protect the health and safety of themselves and other workers and cooperate with site management's safety efforts. All employees are to understand and follow the Graves Construction Inc. Safety and Health Program Manual, job site safety policies, and other applicable rules and regulations. All employees have a responsibility to identify and correct hazardous situations, or bring them to the attention of job site supervision.
  - Injury Management—Every injury, no matter how slight, shall be reported to that employee's foreman or other appropriate supervisor. Employees are to be informed of the name and address of the local company medical provider or health care facility and are to use that facility for first aid treatment. All injured employees are to be accompanied to the physician by a management representative. Any employee who has obtained outside medical treatment for an alleged work site injury or illness must report the injury or illness and the name of the attending physician to his/her supervisor no later than the first normally scheduled workday following his or her outside medical treatment. Failure to comply with this policy may result in the denial of workers' compensation benefits and may be cause for termination.
  - "Tool-Box" Safety Meetings— All employees shall be informed that their attendance at scheduled "tool-box" safety meetings is mandatory. This will

allow employees to ask questions, offer suggestions, and air concerns regarding safety on the project.

- Safety Task Assignment Meetings—Each day, foremen are required to gather their crews to discuss the daily activities. As a condition of employment, all employees must attend these meetings. Safety questions and concerns are to be asked in this forum. It is the foreman's responsibility to ensure that his/her employees are prepared for their tasks, i.e., providing PPE, fall protection, tools, and equipment. It is then the employee's responsibility to follow his/her foreman's instructions and perform his/her duties in a safe manner. Employees are required to sign the Safety Task Assignment form before being adjourned from the meeting (Appendix A-6). Failure to attend or failure to sign in may be cause for disciplinary actions.

- Reporting Unsafe Acts or Conditions—Each employee shall be informed that if he/she sees a situation which creates a job site hazard, he/she is to correct it or bring it to the attention of his/her supervisor. Employees shall also be encouraged to offer safety suggestions whenever he/she feels his/her input will be beneficial.

- Disciplinary Action—If an employee engages in any unsafe work practice and/or violates known and accepted safety practices, rules, or laws, he/she is subject to immediate removal from the project by unpaid suspension or permanent dismissal, with or without written or verbal warning or shortcoming statement, at the discretion of management.

- Emergency Procedures—Each employee shall be briefed on established project emergency procedures so that they may respond correctly in case of serious injury, fire, evacuation, or other conditions.

- Drug and Alcohol Policy—Employees shall be made aware of the Graves Construction Inc. Drug and Alcohol Policy. Procedures detailing the makeup and intent of the program need to be presented. Employees are to be made aware of the requirements and know why a drug-free workplace is important to Graves Construction Inc.: to ensure a safe and healthful work environment as free from recognizable hazards as possible.

- Procedures for Correcting Safety and Health Hazards—Employees shall be made aware of the Graves Construction Inc. Procedures for Correcting Safety and Health hazards. These procedures are outlined in the employee handbook.

- One vital key to success of safety and health programs is holding first line supervision accountable for safety and health performance. Since foremen and other supervisors play such a key role, it is necessary that each supervisor know his/her safety responsibilities.

- Supervisor safety training shall include the following items of responsibility:

  - Safe Work Areas—The supervisor shall be familiar with his/her crews' work areas and ensure that safe conditions are maintained. Upon identification of

an unsafe condition, it will be the responsibility of the supervisor to make sure those conditions are corrected before work continues.

- Safe Work Practices—When the supervisor assigns work to a crew, he/she shall ensure that they are instructed in the proper work methods, and the proper use of personal protective equipment and tools to perform the job safely.

- Supervising for Safety—The supervisor shall monitor the crew's progress to assure that safe work practices are being used.

- "Tool-Box" Safety Meetings

- Safety Task Assignment Meetings

- Emergency Procedures—Each supervisor shall become completely familiar with the project emergency procedures so that they can provide the needed leadership required in case of serious injury, fire, evacuation, or other situations.

- Incident Investigations—Supervisors are required to actively participate in the investigation of any incidents that result in:

  (1) Personal injury to a crew member—This includes the filling out of the Incident Report form (Appendix A-7) and its return, on the same day, to the project field office.

  (2) Equipment or property damage in the supervisor's area of responsibility. Fill out the Incident Report (Appendix A-7) and return it, the same day, to the project field office.

  - Additional/Periodic Training—It may be necessary for supervisors to attend specific training courses that emphasize construction safety and health. When the need arises, and the courses are available, management should make every effort to get the supervisors under their direction into those courses. Supervisors shall annually attend refresher training and instruction as deemed necessary by OSHA mandates, or Project Managers/Manager of Safety and Health's request.

Tool-Box Safety Meetings

- Supervisors shall hold "tool-box" safety meetings with their crews at the beginning of each new job and at least weekly thereafter to discuss procedures, suggestions, past incidents, and educational material pertaining to the work involved. These meetings shall be held on Monday at the beginning of the first shift each week. Safety problems of the previous week, conditions to be expected in the coming weeks, material safety data sheets, etc., shall be discussed along with first-aid, reporting of incidents, and other general safety topics. "TOOL-BOX" SAFETY MEETINGS ARE MANDATORY—EVERY EMPLOYEE MUST ATTEND OR FACE DISCIPLINARY ACTIONS. To keep the meetings a valuable educational experience, the following ideas are suggested:

- Keep the meetings moving, avoid redundancy on one particular topic.
- Use illustrated material and demonstrations to make key points.
- Discuss one topic at a time.
- "Tool-Box" meetings are not a gripe session; they are used to keep employees informed, so keep control of the meeting.

- Supervisors conducting the meetings shall use the Safety Task Assignment Report (STA) form (Appendix A-6). All attendees must sign the report form and items discussed shall be explained in the appropriate sections. The STA form shall be forwarded to the Project Manger and the site safety representative. These records must be obtained in a project file for at least 3 years after completion.

Safety Task Assignment Meetings

- Each day, foremen are required to gather their crew to discuss the daily activities and assignments. During this gathering, foremen shall discuss safety aspects of individual's jobs and tasks. This is to raise employee awareness and get them thinking about safety at the beginning of the day. It is the foreman's responsibility to ensure that his/her employees have the appropriate personal protective equipment, are provided adequate fall protection as required, and have the proper tools and materials necessary in order to perform their assigned tasks. The foreman is responsible for filling out the Safety Task Assignment form (Appendix A-6) and forwarding it to his/her supervisor. Safety task assignment meetings are mandatory and are required to be held every day. Individuals that do not attend or foremen that do not hold the meetings will be subject to disciplinary action.

Project Bulletin Board

- Designated Drivers/Operators form will be posted on bulletin board.

- In order to promote safety and maintain a highly visible safety profile on the work site, the project shall establish safety bulletin boards. Bulletin boards of a sufficient size to accommodate the following materials may be fabricated on the job or requisitioned:
  - Appropriate OSHA and Workers' Compensation Information posters.
  - Emergency phone numbers (fire department, ambulance, hospital, police, etc.). Also include the project field office number.
  - Crane hand signal chart.

- Appropriate safety posters, publications, and communications from the project and home offices.

- Each month, the site incident statistics shall be posted on the bulletin board to keep the employees aware of the safety progress.

- Bulletin boards shall be located where they are readily accessible and may be easily read by employees. A safety suggestion box may be secured near the bulletin board to encourage anonymous participation in the Graves Construction Inc. safety program.

Pre-employment Procedures

- Prior to starting work, employees that are to perform work on the project shall be required to assist in the completion of the following:

  - Submit a pre-employment drug and alcohol test sample. The sample must be given in accordance with the Graves Construction Inc. Drug and Alcohol Policy. The sample must be tested and the results returned to Graves Construction Inc. before the employee is allowed to start performing work activities onsite.

  - Submit to a fitness for duty physical. Refer to Graves Construction Inc. Employment Guidelines.

  - Attend the site safety orientation program and successfully complete all required safety training.

  - Complete a specific task orientation with his/her respective foreman or supervisor. The attending supervisor will determine if the employee has the required skills and abilities to safely perform the tasks that will be assigned to him/her.

  - Temporary employees will be drug tested prior to starting work.

  - Site temporaries will be requested to attend orientation prior to starting work.

- Once all of these items have been accomplished, and the employee has successfully completed and passed them to the satisfaction of site management, that individual will be allowed to perform work activities on the project site.

Designation of Competent Persons

- Prior to the start of construction, the Project Manager and site safety representative shall designate competent persons for various operations performed on the project. They shall use the Competent Person Designation form (Appendix A-8). The form shall be filled out, the individuals identified shall be notified, and it should be kept in the project files. At various times throughout the project, the form will need to be updated. Updating shall be done by the Project

Manager and site safety representative and the procedures outlined above shall be accomplished.

- It is the Project Manager's responsibility to ensure that the individuals identified as competent persons have the required knowledge, experience, and training to fulfill their duties. As a condition of holding the designation, all competent persons must not only have the knowledge, experience, and training, but also have the authority to Stop Work when a particular operation, under their scope, is not being performed correctly. When this happens, the competent person, along with project management, shall abate the hazards and declare the operation safe before allowing work to continue.

Procedures for Correcting Safety and Health Hazards

In order for the safety and health program to be effective, the following procedures for correcting safety and health hazards must be followed. The procedures were developed to reach a solution to detect safety and health problems without outside interference.

Steps to follow when a hazard is observed:

- If the hazard is within the authority of the craftsman, they shall take steps to solve the problem. This may include talking to the craft foreman if appropriate.

- If the craftsman cannot solve the problem, he/she shall report the situation to his/her foreman.

- If the situation is still not corrected, site safety representative shall bring the problem to the attention of the Graves Construction Inc. Project Manager.

- If the situation is still not corrected, the site safety representative should inform the Graves Construction Inc.-Manager of Safety and Health.

OPERATION OF EARTHMOVING EQUIPMENT

Operating Earthmoving Equipment

- No one will operate earthmoving equipment until the following criteria is met:
  - Safety orientation on equipment.
  - Reading of Operator's Manual.
  - Demonstrate to a supervisor, his ability to operate equipment.

Maintaining of Training Records

- Training records are updated weekly.
- To add an employee, they must meet the above requirements and have signed the Training Attendance Sheet that is forwarded to the Safety Department.
- To remove an employee from the equipment list, a written statement with documentation on reason employee should be removed, must be submitted to the Safety Department.

LOCKOUT/TAGOUT CLEARANCE PROCEDURES

Requirement

Whenever service, maintenance, or inspection is performed on machines, equipment, or electrical circuits, it must be done with the machine, equipment, or electrical circuit stopped and isolated from all sources of energy. The energy isolation device(s) for that machine, equipment, or electrical circuit must be locked out and tagged out in accordance with a documented procedure. The Owner's lockout/tagout procedure shall be followed when required. Employees involved in the lockout/tagout program must be given training. When subcontractor employees are performing work within a plant or facility, they must coordinate with the Owner and any other employer to ensure that no employees are endangered. When a group of employees are performing a servicing, maintenance, or inspection activity, each employee must be afforded protection equivalent to the utilization of individual lockout/tagout.

Control of Hazardous Energy Procedure (Lockout/Tagout)

Purpose. This procedure establishes the minimum requirements for the lockout/tagout of energy isolating devices whenever maintenance, servicing, or inspection is done on machines, equipment, or electrical circuits. It shall be used to ensure that the machine, equipment, or electrical circuit is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing, maintenance, or inspection where the unexpected energization or startup of the machine, equipment, or electrical circuit or release of stored energy could cause injury.

Compliance with this Program. All contractors are required to comply with the restrictions and limitations imposed upon them during the use of lockout/tagout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment that is locked out to perform servicing, maintenance, or inspection shall not attempt to start, energize, or use that machine or equipment. Failure to follow the control of hazardous energy procedure will result in disciplinary action.

On the project site, a lockout/tagout log (Appendix A-9) shall be kept by the electrical superintendent. He/she is responsible for administering locks and tags, keeping documented records of who is administered a lock or tag, and documenting when the locks or tags are returned. He/she is also responsible for ensuring that the lockout/tagout program is being followed, and evaluating the program for effectiveness.

Sequence of Lockout

Notify all affected employees that servicing, maintenance, or inspection is required on a machine, equipment, or electrical circuit and that the machine, equipment, or electrical circuit must be shut down and locked out to perform the servicing, maintenance, or inspection.

The authorized employee shall refer to any and all sources to identify the type and magnitude of the energy that the machine, equipment, or electrical circuit utilizes; shall understand the hazards of the energy; and shall know the methods to control energy. This needs to be documented on the Lockout/Tagout Safe Work Permit (Appendix A-10).

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

Deactivate the energy isolation device(s) so that the machine, equipment, or electrical circuit is isolated from all energy sources.

Lock out the energy isolation device(s) with assigned individual locks(s).

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.

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) and 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.

The machine, equipment, or electrical circuit is now locked out. The employee(s) that installed the lock shall apply tag(s) identifying who locked the piece out, the date, and the time.

Restoring Equipment to Service

When the servicing, maintenance, or inspection is completed and the machine, equipment, or electrical circuit is ready to return to normal operating condition, the following steps shall be taken.

Check the machine, equipment, or electrical circuit and the immediate area around the machine, equipment, or electrical circuit to ensure that nonessential items have been removed and the machine, equipment, or electrical circuit components are operationally intact.

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

Verify that the controls are in neutral.

Remove the lockout/tagout devices and re-energize the machine, equipment, or electrical circuit.

> Note: The removal of some forms of blocking may require re-energization of

the machine before safe removal.

Notify affected employees that the servicing maintenance or inspection is completed and the machine, equipment, or electrical circuit is ready to use.

HAZARD COMMUNICATION PROGRAM

Introduction

In order to reduce the risk of hazardous chemical exposure and maintain consistency with the Occupational Safety and Health Administration (OSHA), Hazard Communication Standard 29 CFR 1910.1200, Graves Construction Inc. has prepared and adopted the following written Hazard Communication Program to be implemented by Graves Construction Inc. and all of its subsidiary firms herein referred to individually and collectively as "Graves Construction Inc."

The purpose of the program is to inform the employees of chemicals know by Graves Construction Inc. to be in their workplaces that may create a health or safety hazard. Employees with potential exposure will be provided with information and training on their safe use and handling precautions and emergency and first aid procedures.

Potentially Hazardous Chemicals

OSHA defines a "hazardous chemical" as any chemical that creates a physical or health hazard. A chemical is a health hazard if there is statistically significant evidence, based on at least one valid scientific study that acute or chronic health effects may occur in exposed employees. A chemical is a physical hazard if there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, organic peroxide, oxidizer, pyrophoric, or unstable (reactive or water reactive). Health hazards include chemicals that are carcinogens, toxic, or highly toxic agents (reproductive toxins, irritants, corrosives, sensitizers, hepatoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes).

Although chemical hazards of a chemical can be objectively defined in terms of testing requirements, health hazards' definitions are less precise and more subjective.

For hazard assessment purposes, OSHA uses the following definitions:

- Corrosive—A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact in animal testing.

- Highly toxic—A chemical in any of the following categories:

  - A chemical that has a median lethal does (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rates weighing between 200 and 300 grams each.

  - A chemical that has a median lethal does (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24

hours with bare skin of albino rabbits weighing between 2 and 3 kilograms each.

- A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour to albino rats weighing between 200 and 300 grams each.

- Irritant—A chemical that is not corrosive, but which causes a reversible inflammatory effect on living tissue by a chemical action at the site of contact when tested on the intact skin of albino rats.

- Sensitizer—A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

- Toxic—A chemical falling within any of the following categories:

  - A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

  - A chemical that has a median lethal does (LD50) of more than 200 milligrams per kilogram, but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours with the bare skin of albino rabbits between 2 and 3 kilograms each.

  - A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million, but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for 1 hour to albino rats weighing between 200 and 300 grams each.

Mixtures of chemicals are evaluated for health hazards on the basis of data covering them or on the basis of data on any constituent chemical which comprises 1 percent or more of the mixture. If a constituent chemical comprises 0.1 percent or more and is a carcinogen, the mixture must be considered carcinogenic. If a mixture component represents less than 1 percent but might result in workplace exposures exceeding OSHA permissible limits or in harm to employees, the mixture is deemed a hazardous chemical.

A list of hazardous chemicals and mixtures known by Graves Construction Inc. to be present in your workplace can be obtained from your supervisor. The list identifies each chemical and mixture and the areas where such are used or stored. This list will be reviewed by the Program Administrator and updated as hazardous chemicals are removed from or introduced into your workplace. Graves Construction Inc. employees on field assignments working in another employer's workplace who suspect they are working around hazardous chemicals can request the other employer to provide a copy of the Material Safety Data Sheet (MSDS). The Program Administrator shall be advised and sent a copy of the MSDS.

Material Safety Data Sheet

The Material Safety Data Sheet (MSDS) is the main vehicle for communicating the hazards and safe handling and emergency procedures for each individual hazardous chemical in the workplace.

Chemical manufacturers and importers must obtain or develop a MSDS for each hazardous chemical they produce or import. Employers must have a MSDS for each hazardous chemical which they use in their workplace. For each chemical that is hazardous, Graves Construction Inc. will keep on file a MSDS. This sheet will provide specific information about the chemical, including the chemical and common name of the substance, the physical and chemical characteristics of the substance, the substance's physical and health risks (skin contact, inhalation, absorption), permissible exposure levels, whether the hazardous chemical is considered to be a carcinogen, precautions for safe use and handling, protective equipment and other information ensuring the safe industrial use of chemicals, the potential for fire explosion and reactivity, emergency and first aid measures, the name and address of the chemical manufacturer or supplier who prepared the MSDS, and the date the MSDS was prepared. All hazard information known to the manufacturer should be included on the MSDS.

Material Safety Data Sheet Responsibilities

The director of purchasing should be responsible for obtaining the MSDS on each hazardous material purchased by Graves Construction Inc. Individuals responsible for purchasing at other Graves Construction Inc. facilities shall have the same responsibilities. In addition, they shall keep a master file on all MSDSs received by the firm. A copy must be sent to the Program Administrator and to the manager of the department downstream who will ultimately use the product. When there is a choice of products, the least toxic shall be purchased.

The Program Administrator will review the MSDS to the extent of ascertaining that the sheets are complete and not obviously unacceptable.

On project work sites, MSDSs are to be collected by the shipping and receiving handler and forwarded to the site safety representative who will then put the MSDSs in a log book. Keep MSDSs filed in an orderly process.

The shipping and receiving handler shall also keep copies of MSDSs and request, from the supplier, any MSDS that does not come in with the load.

Employee Access to Material Safety Data Sheets

The manager of each department where hazardous materials are received, stored, or used shall maintain a notebook containing MSDSs for each hazardous material in the workplace. They must ensure that these MSDSs are readily accessible during each work shift to employees when they are in work area. Employees are expected to review the MSDS before using any hazardous material.

On project work sites, MSDS locations are to be developed by the site safety representative. Employees are to view the MSDSs at these locations.

Labeling

The site supervisor and warehouse manager shall ensure that all containers of hazardous chemicals received by Graves Construction Inc. have labels affixed to them that identify the hazardous chemical in the container and provide appropriate hazard warnings consisting of the specific dangers associated with exposure to the hazardous chemical.

The managers of each department where hazardous chemicals are stored and used are required to ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked with information giving the identity of the hazardous chemicals and appropriate hazard warnings. The managers shall ensure that labels are prominently displayed on all containers of hazardous chemicals. In order to maximize employee safety, the employees must assist in this task. Employees should take care not to deface or remove warning labels from containers of hazardous chemicals. The labels must remain on the containers of hazardous chemicals and remain legible at all times. Employees should promptly notify their supervisor of missing or defaced labels.

In addition, an employee should not transfer a hazardous chemical from a labeled container to an unlabeled container unless the unlabeled container will be under the employee's exclusive control during the employee's work shift. The chemical should not be left in the unlabeled container after the employee leaves work. Employees should not use chemicals they find in unlabeled containers.

Employee Training

All employees who may be exposed to hazardous chemicals under normal operating conditions, while performing non-routine tasks, or under foreseeable emergencies will receive training on how to use or handle safely, all hazardous chemicals present in their work areas.

Training responsibility will be the responsibility of the Program Administrator. Employee training sessions will include specific instructions on the following:

- The location of copies of the written hazard communication programs.
- The location of all hazardous materials within their work place.
- The location of the MSDSs and instructions on how to read and interpret information on labels and MSDSs.
- An explanation of the requirements of the standard and how the hazard communication program works in their specific workplace.
- Detection of the presence or release of a hazardous substance.
- Measures employees can take to protect themselves from the hazards.

- Education as to the physical and health hazards of the chemicals and hazardous materials in the employee's workplace.

- An explanation of specific procedures put into effect by Graves Construction Inc. to provide protection such as safe work practices, emergency procedures, and the use of personal protective equipment.

The hazard communication program will use various methods of training including lectures, videos, slides, question and answer sessions, quizzes, or other appropriate formats.

All new employees will receive training prior to their performing assigned duties in work areas where hazardous chemicals are used or present. All employees will receive appropriate training whenever a new chemical is introduced into their work area.

To document the training, all employees are to sign the Hazard Communication Program Training Certification at the end of their training session.

Supervisor/Employee Responsibilities

Supervisor Responsibilities

- Review and post written program.

- Obtain and post MSDS sheets for chemicals being used.

- Assure proper labeling of containers.

- Provide necessary personal protective equipment.

- Assure proper handling and use of chemicals.

- Train/retrain routine users as required.

- Facilitate response to questions or inquiries related to this program.

Employee Responsibilities

- Read labels and material safety data sheets.

- Know where to find information about workplace chemicals.

- Follow warnings and instructions.

- Use the correct protective clothing and equipment when handling hazardous substances.

- Learn emergency procedures.

- Practice sensible, safe work habits.
- Ask your supervisor when in doubt.

INDUSTRIAL HYGIENE

Industrial hygiene is primarily concerned with the control of occupational health hazards that arise as a result of, or during, work. The purpose of industrial hygiene is devoted to anticipation, recognition, evaluation, and control of hazards or stresses in the workplace that may cause illness, injury, or significant discomfort. These are the fundamental concepts of providing all employees with a healthy working environment.

Program. An industrial hygiene program shall consist of the following:

- A database of information related to the workplace (e.g., processes, employee characteristics, chemical used).
- Methods to organize and administer the evaluations and controls required to provide a safe and healthful work environment.
- Access to trained and qualified personnel to perform the functions of the program.
- Management support.

Recognizing Hazards. The various factors or hazards that may cause illness, injury, or significant discomfort can be classified as chemical, biological, ergonomic, and human factors:

- Chemical Hazards—These develop from excessive exposure to concentrations of chemicals in the work environment. Workers can be exposed through inhalation, ingestion, or skin contact.
- Physical Hazards—These include noise, vibration, temperature extremes, and radiation (ionizing and non-ionizing).
- Biological Hazards—These include molds, fungi, bacterial, and viral agents found in the workplace.
- Ergonomic and Human Factors Hazards—This area of industrial hygiene concerns itself with the “person/machine” interface.

Respirator Program

This respirator program is intended to control the employee’s exposure to undesirable atmospheric conditions in the course of performing his/her assigned tasks. OSHA Standard 29 CFR 1926.134 states that respirators must be used if administrative and/or engineering controls fail to reduce air contaminants to an acceptable level. The use of respirators must follow the OSHA Standard 29 CFR 1926.134 as follows:

- Selection—Respirators shall be selected based on the anticipated hazards present in the work area. Selection shall be made by a competent industrial hygienist, safety manager, or other technically qualified person.

- Air Quality—Information based on several factors must be used to determine air quality and the selection of the proper respirator such as the following:

  - Following chemical manufacturer's recommendations for use of a product (MSDS).

  - Conducting air sample tests in the work area.

  - Using data from NIOSH recommendations.

  - `Compliance with OSHA 29 CFR 1910—Subpart Z standards.

Training and Fit Testing. Respirator users shall be instructed in the use, care, cleaning, and inspection of the respirator, limitations of the respirator, factors affecting face piece-to-face seal, the proper way to don the respirator, the procedures for performing a positive and/or negative pressure fit test each time the respirator is worn, and methods to determine when filters and cartridges need to be replaced.

All respirator users must be determined medically fit to use a respirator. This requirement can be met by performing a pulmonary function test which should be a part of the post job placement health screening. In addition, all respirator users shall be fit tested prior to the use of any respirator to identify the respirator which provides the best face piece-to-face seal. All persons anticipating a need for respirator usage should make previous arrangements with their supervisor who will contact one of the persons listed above for assistance.

At the time of fit testing, each prospective respirator user will be appropriately trained as described above, and will be apprised of the existence and specific need to adhere to policies set forth in this respirator program. After completion of all training, the Respirator Protection Training Record must be completed by the trainer, signed by the user, and filed in the employees file.

Issuance of Respirators. All respirators will be issued for individual use only. After each use, the respirator must be cleaned, disinfected, and visually inspected for defects, repaired, and stored in such a manner to prevent tampering, contamination, or damage. The individual user is responsible for determining whether used filters and cartridges are still adequate for reuse based on the training provided. If there are any questions on whether or not the cartridge or filter can be reused, a new cartridge or filter should be used.

Cleaning of Respirators. Respirators must be cleaned by totally dismantling all parts and washing them in warm water and/or an acceptable cleaner supplied by the manufacturer. Following the washing, a thorough rinsing with clean warm water is required. The rinse shall be followed by sanitizing in a 50 ppm concentration of chlorine in water (2 tablespoons chlorine bleach to 1 gallon of water). The respirator and all parts shall then be air dried, inspected, and stored.

Storage of Respirators. Workers shall store their respirators in plastic bags that are then placed in boxes. The respirators shall be stored totally assembled (without filters or

cartridges), in a manner so as to not distort or allow pressure on the face piece. Clean respirators shall not be placed in a storage bag which previously contained a contaminated respirator. Individuals shall write their name on the storage container to avoid use by another person.

Inspection of Respirators. Respirator inspection shall take place during cleaning and before use by the individual user. The integrity and condition of the face piece, straps, inhalation and exhalation valves, gaskets, speaking diaphragms, etc., shall be checked and any worn or defective parts shall be replaced.

Work Area Surveillance. The respirator user shall be alert to changing environmental conditions while in the field, so that any corresponding changes in required respiratory protection can be appropriately made. This is the responsibility of the individual wearer; however, project supervision is responsible for informing the user of other operations that might contaminate his/her work area.

Respirator Program Evaluation. An evaluation and updating of this established respirator program and policies shall be performed in the following cases:

- Should problems arise.
- As needed to comply with changing federal government regulations.
- As a minimum, on a yearly basis.

Pulmonary Function Testing. During pulmonary function testing, any persons demonstrating less than 80 percent reduced pulmonary functions from the expected norm, or exhibiting difficulty in breathing during fit testing or respirator usage shall be required to undergo a complete physical evaluation by a doctor before a respirator will be checked out for the individual's use. The person so noted must then have a signed statement by a qualified physician stating that he/she is physically able to wear a respirator under expected conditions, prior to being issued a respirator. The Project Manager shall ensure that a local physician is set up to perform these duties.

Approved Respirators. Only NIOSH approved respirators will be stocked and available for use by Graves Construction Inc. employees. It is the responsibility of the person ordering respirator supplies to ensure that only approved respirators are purchase.

Qualitative Fit Test Method

Although several methods are recommended by OSHA for fit testing purposes, Graves Construction Inc. has adopted the isoamyl acetate (banana oil) method as the recommended type to be used on all projects.

Isoamyl acetate method:

- Respirator Selection—Respirators shall be selected as described in the respirator selection procedure except that cartridge type respirators shall be equipped with organic vapor cartridges.

- Fit Test Procedure—The following shall be followed:
  - The test conductor shall review this method with the test subject before testing.
  - The test subject shall be allowed to smell a weak concentration of the banana oil to familiarize the subject with the characteristic odor.
  - The test subject shall properly put on the respirator selected and wear it for at least 10 minutes before starting the fit test.
  - The test subject shall perform the conventional positive pressure and negative pressure fit tests. Failure of either check shall be cause to select an alternate respirator.
  - Crush an isoamyl acetate fit test ampule, such as the North Part No. 7002, or equivalent.
  - The test conductor shall hold the crushed swab 2 to 3 inches from the face seal area of the test subject and move around the whole perimeter of the mask.
  - The test subject shall be instructed to do the following exercises while the respirator is being challenged by the banana oil. Each exercise shall be performed for 1 minute:

    (1) Breathe normally.

    (2) Breathe deeply. Be certain breaths are deep and regular.

    (3) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not dump the respirator against the shoulder.

    (4) Nod head up and down. Be certain motions are complete and made every second. Inhale when head is in the full up and down positions.

    (5) Talk. Talk aloud and slowly for several minutes.

    (6) Jog in place.

    (7) Breathe normally.
  - The test subject shall indicate to the test conductor if the characteristic smell of banana oil is detected. If detected, the test conductor shall stop the test. In this case, the tested respirator is rejected and another shall be selected.
  - This fit test shall be performed in a location with ventilation sufficient to prevent general contamination of the testing area by the test agent.
  - Documentation of employee fit testing shall be recorded.

Facial Hair. Any established facial hair in the sealing surface of the respirator is prohibited. Respirator users shall be clean shaven in order to provide and acceptable seal.

Eyeglasses. The temple bar of eyeglasses can cause leakage around the face masks; therefore, plain safety glasses should be removed when wearing full face piece respirators. A special respirator eyeglass insert is available for personnel who must wear corrective glasses.

GASES, VAPORS, FUMES, DUSTS, AND MISTS

Special considerations shall be given to all operations, materials, and equipment that emit toxic gases, fumes, vapors, dusts, or mists into the working environment. If it is determined that such atmospheric contaminants may be released into areas where persons are employed, the concentrations of the contaminants shall be brought within safe limits by design and engineering controls, such as ventilation, filtration, or installation of exhaust systems. When contaminants cannot be adequately controlled by design and engineering methods, special operating procedures should be developed that provide the equivalent protection. Acceptable safe limits for contaminants are those recommended in the latest edition of the "Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment," published by the American Conference of Governmental Industrial Hygienists, and 29 CFR Parts 1910.1000 through 1910.1047.

Testing. Approved testing devices shall be used for determining concentrations of toxic and flammable gases, vapors, fumes, dusts, mists, and oxygen deficiency. Tests shall be performed, and collected data shall be analyzed and evaluated by a competent person. The use of Graves Construction Inc. industrial hygienists may be necessary. Work site environments should be sampled and evaluated during initial start of operation and once each shift thereafter until the environmental hazard has been abated. More stringent testing and evaluating requirements for specific operations or functions contained elsewhere in these standards supersede these requirements.

Periodic Verification. The efficiency of the control system, equipment, devices, and methods shall be checked and verified periodically. Control systems shall be operated continually during operations where persons are exposed to airborne contaminants or flammable gases.

Maintenance. Exhaust systems and air cleaning equipment shall be designed and installed in a manner that facilitates routine maintenance and the removal of dust or other collected material without contaminating the general atmosphere.

Disposal. Toxic materials removed by exhaust systems or other methods shall be disposed of in a manner that will not create a hazard to other employees or the public.

Portable Equipment. Airborne contaminants exceeding acceptable safe limits created by portable equipment, such as saws, drills, and grinding machines, shall be effectively controlled at the source.

Oxygen Deficiency. Employees shall not be permitted to enter or work in atmospheres containing less than 19.5 percent oxygen, by volume, unless provided with and trained in the use of applicable respiratory protective devices.

Asbestos

The Federal Occupational Safety and Health Administration has established a standard (29 CFR 1926.1101) which controls construction worker exposure to asbestos. This standard applies to all Graves Construction Inc. employees who work in areas in which asbestos has been determined to be present.

Definition. Asbestos is any material containing 1 percent or more of asbestos, tremolite, anthophyllite, or actinolite.

Procedure. It will be the policy of all Graves Construction Inc. job sites to prevent exposure of employees to asbestos. Graves Construction Inc. employees are to be trained to identify material which may be asbestos, but removal or encapsulation shall be performed by a licensed, trained asbestos abatement contractor.

The following procedure is required when handling asbestos:

- Major sources of potential exposure:
  - Opening boxes containing asbestos materials.
  - Cutting insulation, transite, or asbestos/cement pipe with hand or power tools.
  - Mixing asbestos with cement for fireproofing materials.
  - Removing or installing asbestos roofing and siding.
  - Removing asbestos leak sealant material.
  - Cadwelding.
  - Asbestos friction pad or brake work.
  - Using asbestos fire blankets or hot gloves.
  - Removing old insulation from lines and vessels.
  - Grinding or sanding on gaskets, floor tiles/mastic, or paints/coatings containing asbestos.
- Methods of recognizing asbestos:
  - Assume that insulation or other suspicious materials contain asbestos unless there is positive proof that they are asbestos-free (refer to the material's MSDS when in doubt).
  - Proof that a material is asbestos-free may be obtained by laboratory analysis or by a reliable marking system used at the facility. Examples of marking

systems include colored bands, threads or flecks incorporated into insulation, or stencils.

- The client often has identified asbestos through his own asbestos recognition and abatement program.

- Prohibited Activities—All employees should be instructed to avoid contact with asbestos, including the following prohibited activities:

  - Drilling holes, sanding, or otherwise damaging materials containing asbestos.

  - Dusting floors, ceilings, moldings, or other surfaces in asbestos contaminated environments with a dry brush or sweep with a dry broom.

  - Vacuuming up asbestos containing debris.

  - Removal of ceiling tiles below asbestos containing materials without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures.

  - Removal of dry ventilation system filters.

  - Shaking out ventilation system filters.

- Notifications:

  - The US Environmental Protection Agency (EPA) or the appropriate designated office requires notification as follows:

    (1) Normally, the owner of the facility where asbestos removal is taking place is responsible for notifying the EPA. (Copy of notification documentation shall be kept on file.)

    (2) 10-day advanced notice for asbestos demolition of at least 260 linear feet on pipes or at least 160 square feet on facility components.

    (3) 20-day advanced notice for asbestos demolition of at least 260 linear feet on pipes or less than 160 square feet on facility components.

    (4) As soon as possible for any emergency demolition.

    (5) State, county, and/or city agencies may also require notification.

    (6) All employees working in the vicinity of asbestos abatement work are to be informed of the following:

      (a) The type of work being performed.

      (b) The location of the work.

(c) Restricted areas where access is required, and their restrictions.

(7) Keep in mind that each state has the right to meet or exceed the federal standard.

- Monitoring:
  - Permissible Exposure Limits (PEL): In accordance with the OSHA asbestos standard for the construction industry, the PEL is 0.1 fiber per cubic centimeter (f/cc of air as an 8 hour time weighted average). There is also an excursion limit of 1 f/cc as averaged over a sampling period of 30 minutes.
  - Monitoring must be performed whenever Graves Construction Inc. employees work in an area where concentrations of asbestos can be reasonably expected. Asbestos abatement procedures will not be performed by Graves Construction Inc. employees but by a licensed asbestos abatement contractor.
- Training—Training shall include the following information:
  - Health effects associated with asbestos exposure.
  - Methods of recognizing asbestos on each project.
  - The nature of operations specific to each project which could result in exposure to asbestos.
  - Contents of the OSHA Standard 29 CFR 1926.110l.
- Regulated Areas:
  - Upon identification of asbestos, and prior to commencing asbestos work by a contractor, barricades and warning signs will be erected at a sufficient distance to permit a person to read them and take precautions prior to entering an area in which asbestos abatement is in progress. The purpose of barricading signs is to do the following.

    (1) Limit access.

    (2) Minimize number of people within the area.

    (3) Protect people outside from exposure to asbestos.

    - Warning signs shall read:

      (1) Danger.

      (2) Asbestos.

      (3) Cancer and Lung Disease Hazard.

      (4) Authorized Personnel Only.

(5) Respirators and Protective Clothing Required.

- Cleanup and Disposal:
  - Cleanup and disposal of asbestos waste bags, drums, and containers shall be the responsibility of the asbestos abatement contractor.
  - All asbestos disposal waste bags, drums, and containers must be marked:

    (1) Danger.

    (2) Contains Asbestos Fibers.

    (3) Avoid Creating Dust.

    (4) Cancer and Lung Disease Hazard.

Non-asbestos Fiber Precaution

Refractory Ceramic Fiber. Recently published toxicological studies have indicated potential health risks to employees exposed to refractory ceramic fibers. As a result of this information, specific handling procedures are recommended. The following is a brief summary of the refractory ceramic fiber information and the recommended work practice:

- Potential Sources—Refractory ceramic fibers are glassy, alumina silica products which are created from molten masses of synthetic raw materials or naturally occurring kaolin clays. The fibrous material, manufactured by different companies is marketed under numerous trade names, including:

Kaowool	Kaolana	Uni-Bloc	Unifelt	Fibralana
Pyro-Log	Ultrafelt	Saber Bloc	Fiberfrax	Ace Kaowool
Pyro-Bloc				

- Refractory ceramic fibers are used in different applications such as foundry work, heat treatment, forging, and chemical refining and processing.

- Health Hazards—Animal studies have indicated that inhalation of refractory ceramic fibers can potentially cause lung tumors. However, the studies have been contradictory. In order to clarify some of the uncertainties raised, new studies have been designed to evaluate the human experience as well as further animal studies with refractory ceramic fibers.

Irritation of the skin and upper respiratory area have also been reported by individuals working with refractory fiber-containing materials. This irritation is a reaction caused by the sharp broken ends of fiber that rub or become embedded in body tissue.

The permissible exposure level has been established by the manufacturers at 2 fibers/cubic centimeter. Refractory ceramic fiber material that has been in service at elevated temperatures (greater than 1,600ºF) may undergo partial conversion to cristobalite, a form of

crystalline silica that can cause severe respiratory disease. The amount of cristobalite present will depend on the temperature and length in service.

Recommended Work Practices. When installing, fabricating, repairing, or removing any refractory ceramic fiber material, the following precautions shall be followed:

- Wear long-sleeved, loose fitting clothing (preferably disposable coveralls) and gloves to prevent skin contact. Unwashed work clothes should not be brought home by employees.

- Safety glasses, goggles, or face shields shall be worn whenever refractory ceramic fiber materials are being applied overhead or in areas where loose particles may get into the eyes.

- An approved respirator should be worn to protect against breathing contaminated air.

- Mechanical dust collection systems should be used whenever refractory ceramic fiber materials are sawed or sanded by machine. All handling and cutting should be done in a manner that will create the least amount of airborne dust (wet method).

- If refractory ceramic fiber particles accumulate on exposed skin, wash the area gently with warm water and mild soap.

- Avoid unnecessary rehandling of scrap materials by keeping waste disposal equipment as close to the working areas as possible.

Heat Stress

The following conditions shall be observed on projects when hot weather work arises. Supervisors shall evaluate the extent of how heat affects workers and shall act accordingly to minimize the risks that workers are subject to. When the temperature rises watch out for:

- Heat Stroke—Heat stroke is the most serious of health problems while working in hot environments. It occurs when the human thermo-regulatory system simply breaks down under stress and sweating stops. There may be little warning to the victim that a crisis stage has been reached. Just why this happens is not known, but when it does, the body's only effective means of getting rid of excess heat is gone.

  A heat stroke victim's skin is hot, dry, and usually red or spotted. Body temperature is 105ºF or higher and rising. He/she is mentally confused, delirious, perhaps in convulsions, perhaps unconscious. Unless the victim receives quick and adequate treatment, death can occur.

  An ambulance should be summoned immediately, but first aid is also vital. The worker should be removed to a cool area, his/her clothes thoroughly soaked with

water, and the body vigorously fanned to increase cooling. Further treatment at a medical facility will continue the cooling process and monitor for a variety of complications that may accompany the disorder. Early recognition and treatment of heat stroke after it occurs is the only means of preventing permanent brain damage or death.

- Heat Exhaustion—Heat exhaustion includes several clinical disorders, all of which reveal similar symptoms. The condition is caused by the loss of fluid in sweating, sometimes by the loss of salt, and often by both. The worker with heat exhaustion still sweats, but experiences extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit and/or lose consciousness. The skin is clammy and moist, and complexion is pale or flushed, and the body temperature is normal or slightly higher.

  In most cases, treatment is simple. Have the victim rest in a cool place and give him or her plenty of lightly salted liquids. Mild cases may result in spontaneous recovery with this treatment. Severe cases may require care for several days. There are no known permanent effects. CAUTION—persons with heart problems or those on a low sodium diet or intake should consult a physician on what to do under these conditions.

- Heat Cramps—Heat cramps are painful spasms of the working muscles of those who sweat profusely in heat, who drink large quantities of water, but fail to replace their bodies' salt loss. The drinking of water tends to dilute the body's extracellular fluids, while it continues to lose salt. Soon, the low salt in the muscles causes painful cramps. Cramps may occur during or after work hours, and may be relieved by taking salted liquids by mouth, or by taking saline solutions intravenously for a more immediate effect.

- Fainting—A worker who is not used to hot environments and who stands erect and immobile in the heat may simply black out. With enlarged blood vessels in the skin and in the lower part of the body, blood may pool there rather than return to the heart to be pumped to the brain. Once lying down, the worker should soon recover. Further moving around can prevent fainting due to blood pooling.

- Heat Rash—Heat rash, also known as prickly heat, is likely to occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. The sweat ducts are plugged, the sweat glands inflamed, and a rash soon appears. When extensive, or when complicated by infection, prickly heat can be so uncomfortable as to reduce a worker's performance. This condition can be prevented by occasionally resting in a cool place and by regularly bathing.

- To avoid these situations, employees should be instructed on how to prepare for the heat, lessen the amount of exposures, take rest breaks, drink plenty of fluids, and explore possible use of protective clothing. Employees shall not be exposed to working conditions that are hazardous to their health.

Cold Stress

Hypothermia results when the body loses heat faster than it can produce it. It is continued loss of heat, occurring in a natural or man-made environment despite protective clothing and the bodily defenses. When this occurs, blood vessels in the skin constrict in an attempt to conserve vital internal heat. Hands and feet are first affected, then involuntary shivers begin. This is usually the first warning sign of hypothermia. Further heat loss produces difficulty of speech, loss of memory, loss of manual dexterity, collapse, and finally death.

Effects on the Body. Temperature of hands and feet can fall as much as 40º to 50ºF below normal body temperature without lasting harm.

The body's sense of cold is a relative factor. Many cases of exposure have occurred in temperatures well above freezing. How cold the body gets depends on many things in addition to air temperature. Moisture on the skin and clothes can conduct heat away from the body much faster than when the skin is dry.

Heat is lost from the body through evaporation even in cold environments. The amount of heat loss from the water evaporating from the skin is not reduced greatly in the cold under ordinary conditions. In fact, water loss decreases even less as the environment becomes colder since there is an increase in the quantity of water loss in respiration compensating for the lesser amount from the skin.

Wind Chill Index. Wind chill is the effect when the wind blows away the thin layer of air that acts as an insulator between the skin and the surrounding air. In still air at 30ºF, the body feels cool, but at the same temperature with a wind 25 miles per hour, the skin gets bitterly cold.

The body's circulatory response to cold reduces blood flow to the skin and extremities. Frostbite, also called congelation, describes the damage that results when tissue temperature falls below freezing as a result of exposure to cold. Superficial frostbite can damage the skin and the tissues immediately below it.

Control Measures. Clothing is a barrier between the body and the environment for the transfer of heat affecting it. Frostbite and hypothermia can be controlled by wearing clothing appropriate to specific types of cold environments. Usually, such clothing combines a wind and waterproof outer layer and multiple, light inner layers designed to produce a dead air space between the body and the outer layer. Cold weather gear may have an effect on maneuverability and efficiency controls.

At extremely low temperatures (below -49ºF), thermal respirators are needed to avoid freezing of lung tissue. Additional defenses include vigorous activity and rubbing affected tingling surfaces to stimulate local

circulation. Numb surfaces should not be rubbed. If practical, treat affected parts with warm water or warm compresses. Outdoor workers are likely victims of hypothermia if they do not take necessary precautions to ward off exposure and exhaustion.

Insects, Vermin, and Snakes

Protection from exposure to insects, vermin, or snakes shall include the following controls as are necessary to eliminate or reduce the hazard:

- Boots, hoods, netting, gloves, masks, or other necessary personal protection.
- Repellents.
- Drainage, spraying, burning, or destruction of breeding areas.
- Smudge pots and aerosols for protecting small areas.
- Elimination of unsanitary conditions which propagate insects or vermin.
- Inoculation of exposed employees when recommended by a consulting physician.
- First aid and medical facilities available to treat infected employees.
- Instruction in recognition and identification.
- On job sites where insects, vermin, or snakes are present, site supervision shall instruct employees on the avoidance of such hazards. Any and all control methods mentioned above shall be used to protect workers. First aid and medical services shall also be made aware of the hazards and prepare for occurrences.

Poisonous Plants

In areas where employees are exposed to poison ivy, oak, sumac, or other poisonous plants, the following protective measures shall be taken as appropriate:

- Removal or destruction of the plants.
- Protective clothing shall be worn.
- Protective ointments and wash-up solutions provided.
- Soap and water shall be available for washing exposed skin.
- Approved first aid and medical facilities shall be available for treatment of infected employees.
- Immunization shall be provided for exposed employees as recommended by a consulting physician.
- Instruction in recognition and identification shall be provided.

Acids, Caustics, and Harmful Chemicals

Handling, storage, and use of acids, caustics, and harmful chemicals or materials shall be in accordance with the manufacturer's recommendations and under supervision of a qualified person. Storage of these chemicals and products shall be in areas accessible only to authorized persons. Employees working with acids, caustics, or any other harmful chemical should refer to the Graves Construction Inc. Hazard Communication Program.

Disposal. Disposal of surplus, excess, or waste materials and containers shall be carried out so as not to contaminate or pollute water supplies, rivers, lakes, reservoirs, or streams and shall comply with federal, state, and local regulations.

Protective Clothing and Equipment. Persons handling these substances shall wear protective clothing and use protective equipment as specified by the chemical's MSDS and other requirements as outlined in this manual.

First Aid. First aid and medical facilities adequate to effectively treat exposed persons shall be available. The facility must be made aware of the potential hazards and be prepared and supplied to adequately treat an affected employee.

Emergency Facilities. Chemical laboratories, battery charging rooms, and operations requiring use of large amounts of these materials shall have an emergency approved type eyewash and shower immediately available to the work area.

Non-ionizing Radiation

The following requirements shall be utilized when working around lasers:

- Restriction—Only continuous wave (cw) lasers with output power levels of $10mW/cm^2$ (10 milliwatts per square centimeter) or less and installed and operated in accordance with these standards shall be used. When laser power output exceeds 10 mW/cm^2, laser operational procedures should be developed and monitored by a qualified laser safety officer; employee exposure levels shall not exceed nationally recognized safe values (TLVs, PELs), and the laser equipment and system conform to recommended procedures and control measures contained in the latest edition of ANSI Z136.1, Standards for the Safe Use of Lasers.

- Qualified Personnel—The installation, adjustment, and operation of laser equipment shall be performed by competent personnel trained in the use of lasers. Proof of qualification and training shall be in the possession of the operator when operating laser equipment.

- Eye Protection—Individuals working or entering areas in which a potential exposure to direct or reflected laser light exceeding 0.005 watt (5 milliwatts) shall wear laser safety goggles which will provide protection

for the specific wavelength of the laser and be of an optical density, attenuation factor, and design of laser eye protection as set forth for the operation.

- Warning Signs—Areas in which lasers are used shall be posted with standard laser warning signs.

- Beam Shutters—Beam shutters or caps shall be used or the laser turned off when laser transmission is not being performed. When left unattended for extended times such as lunch period, shift change, etc., the laser shall be turned off.

- Deflectors—Only mechanical or electronic devices shall be used as deflectors for guiding the internal alignment of the laser.

- Beam Location—Revolving laser units shall be operated only above or below the eye level of individuals unless the areas are inaccessible to persons and posted accordingly. The laser beam shall not be directed at individuals.

- Weather Conditions—Wherever possible, lasers shall not be used when it is raining, snowing, or there is dust or fog in the air. In any event, individuals shall be kept out of range of the source and/or target areas during these conditions.

- Labeling Equipment—Laser equipment shall bear a label indicating the manufacturer maximum output and beam spread.

- Light Intensities—Individuals shall not be exposed to light intensities exceeding the following:

    - Direct Staring—1 microwatt per square centimeter.

    - Incidental Observing—1 milliwatt per square centimeter.

    - Diffused Reflected Light—2.5 watts per square centimeter.

- Microwaves—Individuals shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.

Benzene

This section provides guidelines for achieving compliance with the OSHA Benzene Standard (29 CFR 1910.1028). The OSHA standard applies to all Graves Construction Inc. employees at job sites where employees are exposed to mixtures containing greater than 0.1 percent benzene, unless specifically exempted by the standard.

General. Benzene is a petrochemical derivative present in small quantities in most frequently encountered gasoline and solvents. Significant potential for exposure to benzene exists primarily in refinery work, although any manufacturing facility using solvents may have benzene present.

Permissible Exposure Limits (PELs). Employees shall not be exposed to an airborne concentration of benzene greater than 1 ppm as an 8 hour time weighted average (TWA), or 5 ppm as averaged over any 15 minute period (short-term exposure limit or STEL).

Regulated Areas. Regulated areas will usually be established by the client. If Graves Construction Inc. is responsible for establishing a regulated area, it should have signs posted at all access points and be clearly marked with barricade tape. The boundaries should be established with a direct-reading instrument whenever possible, otherwise judgment must be used. Access must be limited to authorized personnel. At a minimum, authorized personnel will have received benzene hazard training and fit testing on any protective equipment they are required to wear.

Exposure Monitoring. Employee exposure monitoring must be conducted at least once for each job in each work area that contains benzene. If the client does not conduct monitoring on Graves Construction Inc. employees, then we will do it ourselves.

Respiratory Protection. Respirator selection will be based on Table I in the OSHA standard. Training and fit testing will be done in accordance with the respirator protection program in this manual.

Protective Clothing. Graves Construction Inc. will use the protective clothing specified by the client and applicable OSHA standards. Most impervious materials are adequate for incidental contact; however, tasks requiring total immersion or extended contact with the liquid may require more selectivity. Viton and polyvinyl alcohol (PVA) are the best materials for gloves, but both have specific drawbacks. Consult the Manager of Safety and Health, or an industrial hygienist for assistance when selecting protective equipment.

Medical Surveillance. Monitoring will identify jobs with potential exposure greater than 0.5 ppm of airborne benzene as an 8 hour TWA. If the employee performs these tasks for at least 30 days per year (equivalent to 2-1/2 days per month or about 12 percent of the time), then he or she is required to be enrolled in a medical surveillance program. Exposure to greater than the PEL (1 ppm 8 hour TWA or 5 ppm STEL) for more than 10 days per year also requires medical surveillance.

The initial exam must be conducted prior to assignment to a job which involves the exposure level and frequency described above. The exam must include an occupational history, which should be done on the provided Benzene Related Medical History form (Appendix A-20) and presented to the physician for review.

The exam also includes blood tests. There will be up to a 1 day delay between the time the blood is drawn and the time the results are received. If you want to bring the person onto the job site before these results are received, do not allow him/her to work with benzene until medical clearance is obtained.

Pulmonary function testing is required by the standard if respirators will be worn for at least 30 days per year. For our purposes, pulmonary function testing should be done on all initial benzene physicals.

Emergency exams, including a urinary phenol test, are required if employees are exposed to benzene in an emergency situation. The standard defines emergency as "any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which may or does result in an unexpected, significant release of benzene." (Use Appendix A-19 to document Emergency Exams.)

In the event of an emergency exposure, urine samples may be collected onsite at the end of the shift and sent to the clinic. There is no need to send the employee to the doctor unless he or she is exhibiting symptoms of overexposure. Symptoms of overexposure may include:

- Nausea.
- Severe headache.
- Loss of muscle control.
- Flushed face.
- Nose bleeds.

Arrangements should be made in advance for a laboratory or clinic to perform the analysis and a method of transporting the samples. Sample guidelines are included in the Guidelines for Evaluation of Emergency Exposure to Benzene form. Since several over-the-counter drugs may increase urinary phenol levels, the Questionnaire and Release form shall be completed by the employee at the time the sample is given.

The standard requires that certain information be provided to the physician. The package includes a written Physician's Opinion form, which should be completed and provided to both the Graves Construction Inc. employee and the site safety representative within 15 days of the examination.

Communication of Hazards. Training on signs, labels, and MSDSs should be conducted as part of routine hazard communication training. More detailed training should be completed prior to assignment to a work area which contains benzene.

Graves Construction Inc. subcontractors who may be exposed to benzene must be informed of the presence of benzene and the existence of the OSHA standards. The subcontractor shall provide Graves Construction Inc. with a list of employees who have been trained and fit tested with respirators according to the standard.

Recordkeeping. A file should be prepared for each employee who is participating in the benzene program. The Documentation Checklist for Benzene Standard form, should be used in the front of each file to be sure that all pertinent items are included. These files should be sent to the Graves Construction Inc. Personnel Department at the end of the job.

Employees may obtain copies of their medical records and exposure monitoring results by completing a written request form. This information must be released to anyone designated by the employee in a written request. The Manager of Safety and Health shall be notified if the employee requests the release of information to a third party.

If the client conducts the monitoring, we must receive copies of sample data sheets or summaries that contain at least the following information:

- Date.
- Duration.
- Results.
- Descriptions of sampling and analytical method.
- Name and social security number of employee.
- Job classification of employee.
- Description of type of work.

Observation of Monitoring. Employees will normally observe monitoring as part of their routine jobs. When you conduct monitoring, explain the purpose of what you are doing and briefly describe the procedure to the employees involved.

Inorganic Arsenic/Lead Policy

- Definition:
    - "Inorganic Arsenic" means copper aceto-arsenic and all inorganic compounds containing arsenic except arsine, measured as arsenic (As).
    - "Lead" (Pb) means metallic lead, all inorganic lead compounds, and organic lead soups. Excluded from this definition are all other organic lead compounds.
- Permissible Exposure Limits (PELs)—Graves Construction Inc. will assure that no employee is exposed to inorganic arsenic or lead at concentrations greater than or equal to the permissible exposure limits (PELs). Areas where concentrations exceed or are equal to the PEL are to be designated regulated areas. The PEL for inorganic arsenic is 10 micrograms per cubic meter of air, averaged over an 8 hour period. The PEL for lead is 50 micrograms per cubic meter of air, averaged over an 8 hour period. Initial determinations shall be conducted in areas where exposure may be possible. The action level for inorganic arsenic is 5 micrograms per meter cubed averaged over an 8 hour period. The action level for lead is 30 micrograms per meter cubed averaged over an 8 hour period.
- Notification of Use—When Graves Construction Inc. is required to establish a regulated area (refer to 1926.1118 (f)) for inorganic arsenic, job site management will notify the area OSHA office within 60 days by writing an Inorganic Arsenic Notification letter (Appendix A-22).
  Projects expecting exposures to lead/arsenic are to amend job site policies to notify all workers of potential exposures and receive written consent for medical surveillance, environmental monitoring, etc., as a condition of employment.
- Compliance—Graves Construction Inc. will implement a written plan to reduce exposures to below the PEL by means of engineering and work practice controls. Use the Inorganic Arsenic/Lead Compliance Program for assistance when developing the program (Appendix A-23). The plan shall be revised and updated at least every 6 months to reflect the current status of the program.
- Employee Information and Training—Graves Construction Inc. shall institute a training program for all employees who are subject to exposure above the action level. That training shall be repeated quarterly. For assistance, refer to the Inorganic Arsenic/Lead Employee Training Program (Appendix A-24) and Inorganic Arsenic/Lead Pre-Job Checklist (Appendix A-25).
- Exposure—Monitoring will be conducted each week in all work areas where arsenic and/or lead are, or may be present, until at least two consecutive measurements, taken at least 7 days apart, are below the action level. Once the monitored area is below the action level, no further monitoring of that area is required unless conditions change so as to lead management to believe that earlier monitoring results may no longer be representative of the actual work environment. All monitoring programs shall be coordinated through the site safety representative.
  Samples are to be collected for each shift in each work area. Determinations of airborne exposure levels are to be made from air samples that are representative of each employee's exposure to inorganic arsenic and/or lead over an 8 hour period.

Employees are to be notified in advance of the monitoring and may be present to observe the process. They are entitled to receive an explanation of the measurement procedures and to record the results obtained.

Within 5 working days of the receipt of the exposure assessment, Graves Construction Inc. must notify each employee of the results that represent that employee's exposure. Whenever results indicate exposure in excess of the PEL, the notice must state "Permissible Exposure Limit Was Exceeded," and state the corrective action taken to reduce exposures to below the PEL.

- Regulated Areas—Graves Construction Inc. must designate all regulated areas. Regulated areas are to have signs posted at all access points and be clearly marked with barricade tape. Access must be limited to authorized personnel. In regulated areas, employees may not:
  - Eat or drink.
  - Smoke.
  - Chew tobacco or gum.
  - Apply cosmetics.
- Protective Work Clothing and Equipment—For all employees entering a regulated area, Graves Construction Inc. will provide clean protective work clothing and equipment appropriate to the work operations. This may include:
  - Coveralls or similar full-body work clothing.
  - Gloves, and shoes or coverlets.
  - Face shields or vented goggles when necessary to prevent eye irritation.
  - Impervious clothing for employees subject to exposure to arsenic trichloride.
  - Respirators and appropriate filter cartridges.

Graves Construction Inc. is responsible for cleaning, laundering, or disposing of protective clothing as well as repairing or replacing the protective clothing and equipment as needed to maintain its effectiveness. At the completion of a work shift, all protective clothing is to be removed in change rooms and placed in closed containers. Contaminated containers of protective clothing and equipment which are to be removed from the workplace are to be labeled:

CAUTION: Clothing contaminated with inorganic arsenic/lead; do not remove dust by blowing or shaking. Dispose of inorganic arsenic/lead contaminated wash water in accordance with applicable local, state, or federal regulations.

Any person who cleans or launders clothing is to be informed in writing of the potential harmful effects.

- Respirators—All persons that may be required to wear a respirator must first have a pulmonary function test and be determined physically capable of wearing a respirator. All requirements and procedures outlined in the respirator program shall apply.
  In addition, respirator shall be cleaned and filters changed daily. Employees who wear respirators may leave the work areas to wash their face and respirator face piece to prevent skin irritation.

- Housekeeping—A written housekeeping and maintenance plan must be kept. The plan is to list the frequency for housekeeping operations, and for cleaning and maintaining dust collection equipment. Refer to the inorganic arsenic/lead compliance program for assistance.
  All surfaces must be maintained as free as practicable from accumulations of inorganic arsenic and lead. Floors may not be cleaned by the use of compressed air, and shoveling, sweeping, and brushing may be used only where vacuuming or other relevant methods have been tried and found to be effective. Maintenance and cleaning of equipment must be carried out to maintain its effectiveness. Vacuums are to be used and emptied in a manner to minimize the re-entry of inorganic arsenic and lead into the workplace. Only HEPA filtered vacuums shall be used for these purposes.

- Hygiene Facilities and Practices—For employees required to enter regulated areas:
  - Graves Construction Inc. will provide clean change rooms. These will be equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment. Employees who are required to shower should not leave the work site wearing any clothing or equipment worn during the work shift.
  - Graves Construction Inc. will provide shower facilities to assure that employees shower at the end of each work shift.
  - Graves Construction Inc. will provide readily accessible lunchroom facilities. These will be located outside the regulated area. Graves Construction Inc. will assure that lunchroom facilities are as free as practicable from inorganic arsenic and lead contamination. Employees shall not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust/inorganic arsenic has been removed by vacuuming or other effective cleaning method.

- Employees must wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

- Medical Surveillance—All medical examinations are provided without cost to employees, without loss of pay, and at a reasonable time and place:

  - Inorganic Arsenic—All employees who are, or may be, exposed above the action level at least 30 days per year must be placed in a medical surveillance program and given an initial medical examination. The examination must include those elements described in the OSHA standard. Employees exposed to inorganic arsenic will receive a closing examination upon termination of employment. In addition, examinations will be provided at least annually for covered employees who are under 45 years of age with fewer than 10 years of exposure over the action level. The examinations will be provided at least semiannually for other covered employees.

  - Lead—Initial examinations will be available to employees who are exposed at, or above the action level on any one day. This examination includes biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels. However, participation in a medical surveillance program is not required unless the employee's blood lead level analysis is at, or above, 40 micrograms per deciliter.
    All employees who are, or may be exposed, at or above the action level at least 30 days in any consecutive 12 months must be placed in a medical surveillance program. Employees exposed to lead for 30 days or more, or who received an initial examination, will receive a closing examination upon termination of employment. In addition, full medical examinations will be provided annually for all covered employees. These examinations include those elements as described in 29 CFR 926.62. Biological monitoring will be provided as follows:

    (1) Every 2 months for the first 6 months of exposure and every 6 months thereafter for all employees in a medical surveillance program.

    (2) Every 2 months for all employees whose last blood analysis indicated a blood lead level at, or above, 40 micrograms per deciliter.

    (3) Employees whose blood lead level is, at or above, 50 micrograms per deciliter, are to be removed from exposure until two consecutive analyses indicate that his/her blood lead level is at, or below 40 microgram per deciliter; such employees are to be monitored on a monthly basis.

    If Graves Construction Inc. selects the initial physician, the employee may designate a second physician to review any findings, determinations, or recommendations. The second physician may conduct examinations and laboratory tests as necessary to facilitate this review. If the two

physicians cannot resolve a disagreement, then they will designate a third physician to review the case. Graves Construction Inc. is responsible for costs of these medical reviews.

Graves Construction Inc. must provide to the treating physician:

(1) A copy of the OSHA lead standard and appendices.

(2) A description of the affected employee's duties.

(3) The employee's exposure level or anticipated exposure level.

(4) A description of any personal protective equipment used.

(5) Any prior blood lead determinations.

(6) All prior written medical opinions concerning the employee.

Within 5 working days after receipt of biological monitoring results, Graves Construction Inc. will notify each employee in writing of his/her blood lead level. Graves Construction Inc. will also provide to each affected employee a copy of a written medical opinion containing the information as required in the Federal Lead Standard (29 CFR 1926.62).

- Signs and Labels:
  -- Inorganic Arsenic:

  (1) Areas regulated for exposure to inorganic arsenic must be posted with signs bearing the following information: Danger, Inorganic Arsenic, Cancer Hazard, Authorized Personnel Only, No Smoking or Eating, Respirator Required.

  (2) All shipping or storage containers must be labeled as follows: Danger, Contains Inorganic Arsenic, Cancer Hazard, Harmful if Inhaled or Swallowed. Use Only With Adequate Ventilation or Respiratory Protection.

  -- Lead:

  (1) Areas regulated for exposure to lead must be posted with signs bearing the following:

  Warning, Lead Work Area, Poison, No Eating or Smoking.

- Recordkeeping:
  - In accordance with the OSHA standards, Graves Construction Inc. must establish and maintain an accurate record of all monitoring, medical surveillance, and compliance with this policy.
  - Graves Construction Inc. must also keep, or assure that the examining physician keeps, medical records including those elements described in the OSHA standards.

- All of these records should be sent to the Graves Construction Inc. home office in Jackson, South Carolina at the end of the job. Such records shall be stored and maintained for 40 years. Three months prior to the disposal of all records, Graves Construction Inc. shall notify the OSHA area director of its intent to dispose of the records. The area director may ask for the records for his/her review. If this happens, then Graves Construction Inc. will transmit the records to the area director within the 3 month period.

- These records are to be available to OSHA inspectors and any affected employees. The Manager of Safety and Health shall be notified if the employee requests the release of information to a third party.

Graves Construction Inc. Hearing Conservation Program

Employees shall be protected from the effects of harmful noise levels. This responsibility shall include provisions for determining the presence of harmful noise levels and the implementation of an effective hearing conservation program when noise levels exceed the values set forth herein. The Project Manager shall ensure that noise levels are monitored in all areas where employees are working. Noise levels should be documented using the Noise Level Survey form. These noise levels shall be evaluated by a qualified and trained individual (Graves Construction Inc. industrial hygienists may assist in this task; contact the Manager of Safety and Health).

Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown below when measured on the A-scale of a standard Type 112 sound meter at a slow response:

Duration per Day, Hours	Sound Level, dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105

0.5	110
0.25 or less	115

Sound levels shall be measured by qualified personnel using sound level meters meeting current ANSI S1.4 "Specification for Sound Level Meters," or dosimeters meeting current ANSI S1.25, "Specifications for Personnel Noise Dosimeters."

Periodic Monitoring. Noise monitoring or measuring shall be conducted when exposures are at or above 85 dBA or when employees complain of the loudness of the noise. To determine if areas are at or above 85 dBA, an initial noise monitoring shall be conducted by a qualified person when the project is started as well as in excessively noisy areas.

Engineering controls such as barriers, mufflers, walls, etc., shall be used when practicable. The use of such devices shall be an effective countermeasure that reduces the noise levels below the action level.

Administrative controls such as rotating affected individuals out of the noisy areas shall be used when deemed practicable by the Project Manager. The individuals performing the operation shall be closely monitored and their exposure limits shall not exceed the amount of time deemed safe by the noise level chart for any reason.

When sound levels exceed those set forth in the table above, and engineering or administrative controls are not practicable or effective, hearing protection devices shall be provided and used, and an effective hearing conservation program shall be administered. This program is to incorporate the following minimal provisions:

- Audiologist—The services of a recognized audiologist are to be employed to serve as a consultant in establishing and carrying out an effective hearing conservation program. Exceptions may be granted to this requirement when conditions warrant a lesser degree of protection. The Project Manager shall consult with the Manager of Safety and Health when a hearing conservation program is required. Graves Construction Inc. industrial hygiene specialists may be called in to set up the program.

- Hearing Protectors—Employees are to be provided and required to use hearing protectors that meet ANSI S3.19 and attenuate employee exposure to at least the safe noise level.

- Education and Training—Employees shall be informed of hazardous areas through appropriate signs and instructions (preferably in tool-box and STA meetings). Training on the proper use and maintenance of hearing protectors is also to be provided.

VEHICLES AND EQUIPMENT

Designated Drivers/Operators Procedures

Graves Construction Inc. has adopted a procedure to ensure that only designated employees drive or operate company equipment. This will serve to provide a safe place to work, reduce insurance premiums, and maintain our excellent corporate image. The following information outlines the procedures required:

- All employees who are required to drive company vehicles or operate rubber tired equipment must provide a current, valid drivers license to their supervisor, prior to starting work.

- All individuals who are asked to drive an Graves Construction Inc. vehicle shall let Graves Construction Inc. know if they have been convicted of any of the following violations within a 3 year period from when asked to operate a vehicle:

  - Driving while intoxicated or under the influence of alcohol or drugs. Driving while impaired.

  - Failure to stop and report an accident.

  - Vehicular homicide, manslaughter, or assault.

  - Reckless driving.

  - Possession of an open container of alcoholic beverage.

  - Speed contests, drag racing, or attempting to elude police.

  - Making a false report.

  Any employee convicted of two or more major violations in a 3 year period and/or a suspended license will not be allowed to drive or operate company equipment.

- Equipment operators must also possess verified experience and/or training for each piece of equipment to be operated.

- New crane operators must:

  - Possess verified training and experience for the specific crane to be operated.

  - Have adequate vision and hearing with no history of epilepsy or disabling heart condition.

The superintendent should consult with the site safety representative regarding a potential crane operator's qualifications prior to hiring.

The superintendent shall list the names of authorized drivers/operators on the form provided and post it in the field office (Appendix A-18). There will be no exception, and violators will be subject to disciplinary action to include termination.

Any questions regarding these procedures should be directed to the site safety representative or the Manager of Safety and Health.

Company Drivers

Operating a safe vehicle shall be the responsibility of the driver and his supervisor. The following responsibilities also apply to operators and their supervisors:

- It is the driver's responsibility to assure that the vehicle is in safe operating condition and that adequate seats and seat belts are provided and used by all passengers transported while the vehicle is in motion.

- Drivers shall observe all traffic safety regulations at all times. Special traffic regulations may be implemented by an owner of a project. It is the driver's responsibility to know those regulations. Drivers are responsible for their own traffic violation tickets.

- Any driver operating a company vehicle, found to be under the influence of alcohol or marijuana, or any other controlled or illegal substance, shall be subject to disciplinary action, including discharge.

- Any driver involved in any accident where damage is sustained to the vehicle or other property, shall report the accident to his/her supervisor, and the site safety representative immediately. The driver must complete the Incident Report at the scene, and submit it to the site safety representative the same day of occurrence.

Earthmoving Equipment and Trucks

All equipment shall be maintained in safe working condition and shall be appropriate and adequate for the intended use.

Equipment shall only be operated by qualified, authorized personnel. Equipment maintenance is to be performed only by qualified mechanics.

Equipment operators and truck drivers shall make a pre-shift walk-around safety inspection of their equipment, and any conditions that affect safe operation shall be corrected before further use.

Equipment shall not be operated unless all required guards and safety devices are in place and functioning.

Careless, reckless, or otherwise unsafe operation, or use of equipment shall be grounds for dismissal.

Before performing any service or repair work, all equipment shall be stopped and positively secured against movement or operation, unless it is designed to be serviced while running, in accordance with the manufacturer's instructions.

When equipment is serviced or repaired, the operator shall dismount until the service or repair is completed and then make a complete walk-around safety check before remounting.

All bi-directional earthmoving equipment with an obstructed view to the rear, shall be equipped with an automatic backup alarm which can be heard above and distinguished from the surrounding noise level. Subcontractors and suppliers' delivery trucks must have a signal man in full view prior to, and during, any reverse motion operation on the project if their equipment is not equipped with a backup alarm.

All off-highway earthmoving equipment and trucks such as loaders, dozers, scrapers, motor graders, rock trucks, tractors, rollers, and compactors shall be equipped with rollover protective structures (ROPS) and seat belts, in accordance with applicable regulations. Seat belts shall be used by the operators of all equipment provided with ROPS.

Mobile equipment shall not be left unattended unless parked securely to prevent movement, with all round engaging tools lowered to the ground, brakes set, and the engine off.

Equipment parked at night shall be lighted, barricaded, or otherwise clearly marked where exposed to traffic.

Personnel shall not be transported or ride on equipment or vehicles which are not designated for that purpose.

When fueling equipment or vehicles with gasoline or liquified petroleum gas (LPG), the engine shall be shut down.

Haul roads shall be designed, constructed, and maintained for safe operation consistent with the type of haulage equipment in use. Standard traffic control signs shall be used where necessary.

Elevated roadways shall have axle high berms or guards maintained on their outer banks.

Additional precautions are required when operating equipment on streets and roads open to public vehicular traffic. Appropriate warning signs and flagmen must be utilized to stop traffic when a piece of equipment must cross or enter an active lane of traffic. Equipment must be inspected before start of operation each morning to determine that it is street legal as follows:

- All lights are working.
- Audible horn and backup systems.
- Brakes are in good repair.
- Windows are clean and obstructions removed.
- Rear view mirrors are clean and adjusted.
- Warning triangle is affixed to the rear when moving in traffic.

The applicable contents of this section must be discussed with all subcontractors and suppliers prior to them operating trucks and/or equipment onsite, and full compliance is enforced.

Forklifts and Self-Propelled Aerial Platforms

All forklift operators shall complete forklift training prior to operating a forklift. The Forklift Safety form shall be signed by the operator and his/her supervisor and filed prior to any operating.

All self-propelled aerial platform operators and users shall receive training prior to operating a piece of equipment.

The Safety Rules for Self-Propelled Aerial Platforms form shall be signed by the operator and his/her supervisor and filed prior to operating a piece of equipment.

Prior to operating a self-propelled aerial platform, the piece of equipment must receive an inspection before each use. The operator shall fill out the form completely each day and return the forms to the safety department at the end of each week. Refer to the Self-Propelled Aerial Platform Inspection form .

OSHA INSPECTION PROCEDURES

Introduction

OSHA is authorized to conduct workplace inspections to determine whether employers are complying with standards and to enforce the General Duty Clause, which requires that every working man/woman must be provided with a safe and healthful workplace. Project management shall fully cooperate with OSHA Compliance Officers (COs).

Inspections are usually conducted without advanced notice. In fact, alerting an employer, without proper authorization, in advance of an OSHA inspection can bring a fine at up to $1,000 and/or 6-month jail sentence.

If OSHA shows up on a job site and intends to inspect, the Manager of Safety and Health shall be immediately notified. Additional contact shall be made with the Manager of Safety and Health on frequent basis to keep him informed of the situation and to receive instruction.

Whenever contacted by a regulatory agency (OSHA, MSHA, EPA, etc.), the Notice of Regulatory Contact form shall be filled out and immediately faxed (803-471-9211) to Randy Stover, Manager of Safety and Health.

Procedures for OSHA Citations

In the event a citation or withdrawal order is issued to the company during the course of an OSHA inspection, or by mail from the OSHA area office, the following procedures should be followed to assure the necessary response:

- If a citation is written, the company should arrange for immediate abatement of the cited condition. Once abatement has been achieved, OSHA should be notified and a request made for an immediate inspection.

- Notification of employees and posting requirement in accordance with OSHA regulations must be complied with once a citation has been written.

- The Project Manager will forward originals of all documentation and reports to the Manager of Safety and Health within 24 hours and keep a copy at the site.

- All other procedures and/or contacts with OSHA subsequent to the citation or order, including payment of the proposed penalty, request for and participation in the informal conference, and the desire to contest and have a formal hearing, will be coordinated by the Manager of Safety and Health.

- It is imperative that site supervisory and safety personnel be thoroughly familiar with these guidelines and conduct themselves accordingly.

The Inspection

- CO's Right of Entry—It is the policy of Graves Construction Inc. to cooperate with OSHA in their inspection efforts. If you feel you have a valid reason to deny

access to the OSHA inspector, call the Manager of Safety and Health immediately.

- CO's Credentials—Graves Construction Inc. supervision should always ask to see the CO's credentials. A CO carries US Department of Labor credentials bearing his/her photograph and a serial number that can be verified by calling the nearest OSHA office.

- Opening Conference—In the opening conference, the CO explains how the establishment was selected and determines whether it will be subject to a comprehensive safety inspection. Ask the CO if he or she will utilize the OSHA Focused Inspection procedures. Focused inspections target major hazards that have been identified by OSHA as they are related to the construction industry. The CO explains the purpose of the visit, the scope of the inspections, and the standards that apply. The employer will be given copies of applicable safety and health standards as well as a copy of any employee complaint that may be involved.

- Accompanying a CO—Management has the right and will accompany the CO at all times he/she is on the Graves Construction Inc. job site.

- Conduct of Management—All management personnel should be courteous and pleasant to COs at all times. We are not required to explain processes and procedures, answer the CO's questions, or provide anything (i.e., office space, secretarial support, etc.) other than access to the job site and to records required to be maintained.

  You should remember that anything said by an employee can be used against Graves Construction Inc. In short, you have the right to remain silent and anything you say can and probably will be used against you. Therefore, you should say as little as possible and never admit violations or any elements of violations. This warning applies not only to personal dealings with the CO, but also to telephone conversations and correspondence.

  Extreme care must be exercised to avoid self-incrimination. Statements, records, or other materials that demonstrate management knowledge of a violation can be used to support special investigations and civil and criminal penalties. Generally, only records required by the statute or the regulations should be provided to OSHA, unless a warrant or subpoena is issued. When in doubt as to the advisability of providing records or making statements, consult Graves Construction Inc. counsel.

  When taking notes or writing memos, reports, letters, etc., even to other management personnel, you should assume that OSHA may at some point read them, perhaps in conjunction with administrative or judicial proceedings in court.

  When a citation or order is issued, you should carefully record the facts alleged to constitute the violation and any statements made by the CO. Finally, when the CO indicates that he or she has observed a violation and intends to write a citation or order, you should try to convince the CO not to do so if you feel the CO is wrong. You should carry a copy of the OSHA regulations with you during the

inspection. Look at the regulation allegedly violated and try to convince the CO that the conditions he/she observed are not in fact a violation.

- CO's Warning of Miranda Rights—If a CO begins to warn any management personnel of his/her Miranda rights (the right to remain silent, the right to request an attorney, etc.), that individual should immediately terminate the conversation. The incident shall immediately be reported to Graves Construction Inc. counsel.

- Employee Representative's Right to Accompany the CO—An authorized employee representative is given the opportunity to attend the opening conference and to accompany the CO during the inspection.

  The Act does not require that there be an employee representative for each inspection. Where there is no authorized employee representative, the compliance officer must consult with a reasonable number of employees concerning safety and health matters in the workplace. When including an employee representative, the individual should be chosen from the Craft Safety and Health Committee. The individual should be cooperative and be instructed in the Graves Construction Inc. OSHA Inspection Procedures.

Inspection Proceedings

- Conduct of Management—Employees may be consulted during the inspection tour. The CO may stop and question workers about safety and health conditions and practices in their workplaces. A management representative has a right to be present during this questioning. Do not interfere in these discussions, but keep detailed notes of them.

- Posting and Discussing Recordkeeping—OSHA places special importance on posting and recordkeeping. The CO will check to see that the OSHA 200 Log and other required records have been kept current and that the OSHA workplace poster is prominently displayed. If applicable, each job site is required to post the OSHA 200 Log for that project for the prior year during the month of February.

- Hazard Communications—The Graves Construction Inc. inspection representative should make the CO fully aware of the Graves Construction Inc. hazard communication program, including the written program, employee training, container labeling, and a listing of the job site chemicals (MSDS Log).

- Immediate Abatement of Apparent Violations—During the course of inspection, the apparent violation may be corrected immediately. When they are corrected on the spot, the CO records such corrections to help in judging the employer's good faith in compliance. Even though corrected, however, the apparent violations may still serve as the basis for a citation and, if appropriate, a notice of proposed penalty.

- Closing Conference—After the inspection tour, a closing conference is held between the CO and the employer. The CO also will give the employer a copy of "Employer Rights and Responsibilities Following an OSHA Inspection," and then briefly discuss the information in the booklet and answer any questions.

The CO discusses with the employer all unsafe or unhealthful conditions observed during the inspection and indicates all apparent violations for which a citation may be issued. The employer is also informed of appeal rights. The CO will not indicate any specific proposed penalties. Only the OSHA area director has that authority.

During the closing conference, the employer may wish to produce records to show compliance efforts and to provide information which can help OSHA determine how much time may be needed to abate an alleged violation.

Inspection Results

After the CO reports findings, the area director determines if citations will be issued and if penalties will be proposed:

- Citations—Citations inform the employer and employees of the regulations and standards alleged to have been violated and of the length of time set for their abatement. The employer will receive citations and notices of proposed penalties by certified mail. Graves Construction Inc. job sites must post a copy of each citation at or near the place of the violation for 3 days or until the violation is abated, whichever is longer. In addition, copy of the citation must be sent immediately to the Graves Construction Inc. -Manager of Safety and Health.

- Penalties—An employer may be subject to substantial fines, in some cases as much as $70,000 for each violation. In addition, management personnel may be subject to civil and criminal prosecution.

Appeals Process

- Appeals by Employees—If an inspection was initiated due to an employee complaint, the employee or authorized employee representative may request an informal review of any decision not to issue a citation.

  Employees may not contest citations, amendments to citations, penalties, or lack of penalties. They may, however, contest the time allowed for abatement of a hazardous condition.

- Appeals by Employers—When issued a citation and notice of proposed penalty, an employer may request an informal meeting with OSHA's area director to discuss the case. The area director is authorized to enter into settlement agreements that revise citations and penalties to avoid prolonged legal disputes.

- Informal Conference and Settlement—An informal conference may be requested to clarify or settle a citation and proposed penalty. Informal conferences will be coordinated by the Manager of Safety and Health.

  Graves Construction Inc. has the right to request an informal conference with the OSHA area director within 15 days of notice by OSHA of the right to request such a conference. The OSHA CO will notify you of this right at the close out conference.

  Graves Construction Inc. will request this conference. The Project Manager, site safety representative, and the Manager of Safety and Health should review the

citation(s) received and discuss these matters. The Manager of Safety and Health will coordinate the request for and participation in the informal conference.

Before participating in an informal conference, you should carefully review all company records pertaining to the citation(s) in question and the OSHA CO's citation evaluation sheet. At the conference you will have the opportunity to argue the validity of the citation(s) issued as well as for a reduction in the severity and monetary penalty.

If you disagree with the CO's time for abatement, this should be discussed since a reduction in the penalty assessment is granted for abatement within the time allotted by the CO. At the informal conference you will be speaking with the area director or his designate.

If your job has a good safety and health record, you should take time at the beginning of the conference to summarize your successes. In any event, the Graves Construction Inc. commitment to safety and health shall be presented. Bring a copy of this manual and emphasize project personnel's relevant safety and health training and experience.

You should keep a careful record of this conference. Such a record will support an argument for a penalty reduction if you find a higher penalty subsequently proposed for an identical violation.

- How to Contest—If you wish to contest any portion of your citation, a written Notice of Contest must be submitted within 15 working days after receipt of the citation and notice of penalty. This procedure will be coordinated by the Manager of Safety and Health.

OSHA Checklist

The following is a basic list of items most OSHA COs will ask to see. The project management shall ensure that all items are accounted for on a daily basis:

- Safety program (written).
- Hazard communication program.
- Listing and copy of all MSDSs for all chemicals onsite.
- Documentation records that safety training has been given to all employees on the project.
- GFCI program with the inspection log.
- Crane inspection log with monthly and yearly inspections.
- Records of all safety meetings held onsite (tool-box, STA, committee, weekly, monthly, etc.).
- OSHA 200 form with all recordable cases.

- Personnel hoist training program.
- First aid training records.
- Number of employees onsite.
- Sign and load chart for all cranes.
- Hand signal placard on outside of a crane where a rigger can see it.
- Barricade procedures and checks.
- OSHA posters required by law, properly posted.
- Fire extinguisher log and inspection program.
- Backup alarms and horns on all equipment.

FALL PROTECTION AND CLIMBING PROCEDURE

Equipment Inspection:

Daily inspections of personnel harnesses, tag lines, load lines and load blocks should be conducted. During these inspections, special attention should be paid to D-rings, snap-hooks, and the anti-fall climbing device to insure free and proper operation.

A quarterly inspection will be completed at the start of each new quarter and the proper colored tape applied to the harness.

Climbing:

When climbing a ladder with a safety glide hook from glide of fall protection device to front chest D-ring, never hooking lanyard to the device.

Once the climber has begun making his ascent, he must maintain the 100% tie-off, this includes utilizing the tower manufacturer's safety climb. (The safety cable should never be used as a tie-off point, it's strictly used for movement up or down the tower). When this cable is not present, climbers must use the two-lanyard climbing procedure. Only lanyards equipped with a "shock-absorber" may be used. As the climber moves up or down the tower, a minimum of one lanyard is attached to the tower at all times. **(Positioning lanyards may NOT be used for tie-off.)**

Proper Tie-Off Points:

Before making a climb, climbers should identify points they wish to use as a tie point. Each tie point should be capable of supporting a minimum of 5,000 pounds. Proper tie points include: tower legs, horizontal and diagonal bracing, boom mounts, climbing ladders, and the antenna platform. Items, which should **not** be viewed as safe tie points include: antenna masts, coax ladders, antenna down-tilt brackets, and platform grating. An important item to remember when utilizing the two-lanyard technique is each lanyard should be connected to a separate point.

Hoists:

Commonly called "cat-heads" or "tuggers" are primarily used for moving or positioning equipment and may also be used during coax installation. When using a hoist it is important to remember, as you hang your load block and rigging these points should be viewed the same as tie points, each must be able to support a minimum of 5,000 pounds. Each hoist must be equipped with a braking device. If you are utilizing your hoist to position boom mounts or antenna platforms you must position the block and rigging in such a manner as not to interfere with existing mounts, antennas, coax lines, and climbing devices. When hoisting boom mounts and equipment, it is important that you utilize a tag line, which will help guide and position the mount, it can also prevent the load line from "running" once the weight transfers. Also install fall protection systems prior to flying them into place (e.g., retractables and rope

grab vertical lifelines). Employees may not be hoisted under any circumstances, even though this procedure is approved in OSHA Directive CPL 2-1-1.29 for heights above 200 feet.

RADIO FREQUENCY SAFETY

Radio Frequency Safety

- If there are active Radio Frequency (RF) carriers at the site, we will consider this an active RF site.
- All employees involved with installation, maintenance, site acquisition, or site walk of RF sites (cell, paging or any other RF exposure hazard**.)**

Will comply with the following:

- Employee will attend RF Awareness class.
- Employee will use the appropriate PPE.
- Employee will be required to wear a RF monitor while at the site.
- RF Awareness must be updated annually.
- All personnel on an active site must be trained and have their own monitor.
- The site supervisor will be responsible to determine if the site is active or non-active.
- If site supervisor is unclear if site is active, he/she must not enter the site until he/she has contacted GCI Safety Department.

RF Monitors.

- Issued through small tool program, contact warehouse manager.
- RF monitor must be calibrated every third year.
- RF monitor should include calibration certification.

BARRICADES AND GUARDRAILS

I. PURPOSE

To establish a standardized method of providing barricades and guard rails for the protection of personnel from known hazards.

II. SCOPE

This procedure applies to all construction activities which present a hazard to personnel such as fall hazards or respiratory regulated areas.

III. BARRICADES

A. Warning Barricades

1. Warning barricades call attention to a hazard but offer no physical protection. If a warning barricade does not offer adequate protection, a standard guardrail must be erected.

2. The following four types of warning barricades will be utilized:

   a. YELLOW & BLACK TAPE: Warning caution signs may or may not be needed with this barricade. Employees should exercise caution in determining the hazards involved with entering an area barricaded with this tape. An example of its use would be excavations less than 4 feet deep.

   b. RED TAPE: **Danger!** This color will be used to prohibit entry or passage through an area by all personnel except those who are authorized. Careful job planning is need to use this color so as to assure its effectiveness. Personnel shall not cross a red barricade without authorization from the supervisor responsible for its erection.

   c. YELLOW AND MAGENTA TAPE: This barricade tape marks the area in which radiography is being performed. Personnel are not to cross or alter this barricade tape. Exposure to X-rays can cause serious health problems. Since X-rays cannot be detected by man's senses, it is critical that employees do not cross this type of barricade.

   d. ORANGE AND PLASTIC CONES: These cones will be used to help divert traffic away from equipment set up in roadways.

3. Warning barricades must be kept 5 feet back from the edge of sloped excavations or straight wall excavations that are less than 6 feet in depth and similar hazards. When placed around lay-down areas, or similar non-hazardous situations, they need not be set back 5 feet, but they must fully contain the material or condition being barricaded.

4. One barricade will suffice as protection for several small excavations in an area.

5. Barricade tape shall be suspended approximately waist high above floor or ground level, and shall be kept taut.

6. Barricade tape shall be suspended from barricade stands and shall not be tied to valve handles, instrument lines, fire protection equipment, etc.

7. Barricades must be complete, that is, have the work area surrounded on all four (4) sides. Permanent structures that prevent entry may be used as part of the barricade.

8. Barricades shall be constructed with at least one 3 foot gate or access opening. No one shall duck under or climb over a barricade.

9. Appropriate "Warning," "Caution," or "Danger" signs shall be placed at the entrance and perimeter of the barricade.

10. The barricade shall be identified with a barricade tag. The responsible craft foreman must complete the tag and attach it to the barricade, near the entrance gate. When two or more crafts are working inside a barricade, each craft foreman must attach a barricade tag. The tag(s) must remain in place until it is time to remove the barricade. Tags are available through the tool rooms.

11. A barricade shall not be placed inside another barricade. The supervisor of all crafts working inside the barricade must place a tag at the entrance gate.

B. Standard Guardrails

1. Standard guardrails warn of potential hazards and provide physical protection.

2. Guardrails shall be erected at any location that presents a fall expose of 6 feet or greater.

3. Guard rails shall be placed within 3 feet of the fall exposure zone.

4. All personnel inside the guardrail must comply with Procedure - "Fall Prevention."

5. Guardrails shall be 42 inches high and strong enough to withstand a 200 pound force exerted in any direction.

6. Guardrails shall be constructed of 2 inch by 4 inch wood, tube and coupling scaffold, pipe railing, structural angle railing, wire rope or steel chains.

7. Guardrails must have a mid-rail approximately 21 inches high.

8. Four inch high toe boards shall be erected when guardrails are located above work areas.

9. Vertical stanchions shall be placed at 8 foot centers or less.

10. At least one 3 foot access gate shall be provided. No one will be permitted to duck under or climb over a guardrail.

11. Guardrails shall have a barricade tag.

C. Additional requirements (This section applies to both types).

1. Barricades and guardrails shall be erected prior to beginning actual work to avoid leaving unprotected hazards.

2. The craft beginning the work is responsible for erecting the barricade or guardrail around the work area. All craft personnel working inside a barricade or guardrail are responsible for maintenance while work is in progress and removal when the work is complete.

3. All barricades and guardrails shall have appropriate warning caution or danger signs posted.

4. When a barricade or guardrail is located near a road or a walkway, warning lights will be required.

5. Emergency equipment, such as fire extinguishers, safety eyewashes, showers, etc., shall not be blocked by a barricade or guardrail.

6. Barricades or guardrails will not be allowed to block the operation of a fire door.

IV. ROAD BARRICADES

A. All road barricades must be the physical type (sawhorse or standard guardrail) and shall be marked with flashing amber lights if left overnight.

B. A flagman will be posted if a road barricade extends into a roadway while personnel are working inside the barricade.

CONFINED SPACE ENTRY

I. PURPOSE

The purpose of the Confined Space Entry Program is to:

A. Identify confined space work areas.

B. Identify potential hazards associated with the confined space work.

C. Ensure appropriate preparation of the confined space.

D. Establish adequate control of the confined space.

II. SCOPE

The procedures, practices, and equipment requirements for confined space entries apply to all persons who could be involved in a confined space entry job. An GCI Confined Space Entry Permit is required before a confined space is entered by any employee. Entry occurs as soon as any part of the employee's body breaks the plane of an opening into the confined space whether the individual intends to fully enter the space or not. Entry also includes any ensuing work performed in the confined space.

III. DEFINITIONS OF A CONFINED SPACE

A. Is large enough and configured in such a way that an employee can enter with his/her whole body,

B. Has limited or restricted means for entry or exit, and

C. Is not designed for continuous employee occupancy.

D. Examples of confined space include tanks, vessels, vessel skirts, vaults, pits, storage bins, hoppers, and excavations that are 4 feet or greater in depth.

IV. CONFINED SPACE TYPES

Two types of confined spaces are recognized by the OSHA standard, Non-Permit Confined Space and Permit Required Confined Space. Confined Space Entry Permits are required for both types.

A. Non-Permit Required Confined Spaces

1. A Non-Permit Required Confined Space is defined as a confined space that does not contain or, with respect to atmospheric hazards, does not have the potential to contain any hazard capable of causing death or serious physical harm.

2. Non-Permit Confined Space Entry has the following requirements which must be completed by the project safety personnel and craft supervisor on any confined space entry:

   a. Identify all potential hazards.

   b. Evaluate the confined space atmosphere at the time of entry.

   c. Identify the isolation methods to be utilized.

   d. Identify rescue air and rescue methods.

   e. Verify ventilation equipment needed to obtain entry.

   f. Ensure that standby attendants are in constant communication with all employees inside the confined space.

B. Permit Required Confined Spaces

1. A confined space that contains or has the potential to contain a hazardous atmosphere. A hazardous atmosphere is defined as an atmosphere that <u>may</u> expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following characteristics:

   a. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL).

   b. Contains airborne combustible dust at a concentration that obscures vision at a distance of 5 feet.

   c. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

   d. Atmospheric concentration of any substance for which dose or permissible exposure limit is published which could result in employee exposure in excess of its dose or permissible exposure limit.

   e. Any other atmospheric condition that is immediately dangerous to life or health (IDLH). <u>IDLH confined spaces shall not be permitted for entry. No GCI employee shall enter IDLH confined spaces for any reason.</u>

2. A confined space that contains a material that has the potential for engulfing an entrant. Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can cause death.

3. A confined space that has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section.

4. A confined space that has work related operations that may introduce hazards inside the confined space. If the work involves:

   a. Welding, cutting, grinding, hot riveting, burning, heating, or the introduction or sources of ignition within the confined space, or

   b. The use of flammable or toxic cleaning solutions.

5. A confined space that contains any other recognized serious safety or health hazard.

C. Permit Required Confined Space Entry Requirements

Entry into a Permit Required Space must meet all the requirements listed under Non-Permit Required Confined Space Entry plus the following additional requirements due to the higher hazard potential:

1. The craft supervisor and the safety department shall train all GCI employees involved with the job on the specific hazards of the confined space.

2. If the potential for hazardous atmosphere exists, continuously monitor the atmosphere of the confined space.

3. Develop and document a rescue plan and review it with all employees involved in the job.

4. Typically, clients provide emergency response squads and these should be used if available. If it has been determined that GCI is to provide a rescue team, the following requirements apply:

   a. The project safety office shall train rescuers in the proper use of personal protective and rescue equipment necessary for making rescues from permit spaces.

   b. Each member of the rescue service shall practice making permit space rescues at least once a year by simulating rescue operations by removing dummies, mannequins, or actual people from actual permit space or representative permit spaces.

   c. Each member of the rescue service shall be trained in basic first aid including cardiopulmonary resuscitation (CPR).

   d. To facilitate non-entry rescues, employees shall wear a chest or full body harness with a retrieval line, attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used in lieu of the chest or

full body harness if it can be demonstrated that the use of a chest or full body harness is infeasible or creates a greater hazard and the use of wristlets is the safest and most effective alternative. The project manager along with the safety department and craft personnel doing the work shall jointly make the decision.

e. Ensure communication methods are in place to summon the rescue service in the event an emergency rescue is needed. Example communication methods include hand-held aerosol air horn, plant alarm system, or radios.

V. PERMIT DURATION

The Confined Space Entry Permit shall specify the maximum time duration of authorized entry. The Confined Space Entry Permit is valid only for the maximum specified duration of time, provided that the work is continuous. Terminate the permit when the work has been completed. The specified duration is not allowed to extend beyond the time required to do the job(s) specified on the permit.

VI. CHANGE OF CONDITIONS

If at any time during the job, conditions which could affect the safety of the entrants are altered from those originally planned, the entrants must exit the confined space. The unsafe condition(s) must be corrected and a new fully approved permit must be issued before the work inside the confined space is started again. If emergency conditions develop in the area of the job, the entrants must immediately exit the confined space and the permit must be terminated as soon as the entrants are out. Again, a new fully approved permit must be issued before the work is started again.

VII. PERMIT RENEWAL UPON PARTICIPANT REQUEST

The Confined Space Entry Permit becomes invalid when any participant in the job requests that the permit be renewed. The confined space shall be re-evaluated and a new permit issued, provided that the requirements for entry are met.

VIII. WRITTEN APPROVALS

The designated craft supervisor, assigned confined space attendant, and safety department representative shall sign the Confined Space Entry Permit at the appropriate locations, and all employees entering the confined space shall sign the Confined Space Entry Log.

IX. RESPONSIBILITIES

A. Craft Supervisors and Designated Departments

Craft supervisors responsible for confined space entries must complete the Confined Space Entry Program training course prior to assuming any duties as the entry supervisor. Craft supervisors are responsible for the following:

1. Isolate the Confined Space

Take appropriate steps to effectively isolate the confined space prior to approval of the Confined Space Entry Permit. Isolate the confined space by either blinding or removing all inlet and outlet piping.

a. Blinding – Ensure that the design, material or construction, and installation of the blind are satisfactory for the normal service of the equipment being blinded. Blinds must be capable of withstanding the maximum possible pressure that may be seen by the pipe, line, or duct, with no leakage past the blind. Always install blinds in the flange(s) nearest the confined space being isolated.

b. Removal of piping from the confined space – Disconnect the piping system in such a manner that the contents of the pipe will not be introduced into the confined space in the event of an accidental discharge. If removal of the piping does not eliminate this possibility or if an accidental discharge could create a potentially hazardous condition, blind the open-ended line.

2. Disconnect Energy Sources

If the confined space to be entered is equipped with an electrical, nuclear, or other energy source, the Confined Space Entry Permit must meet all the requirements of the site's lockout/tagout program.

If the confined space to be entered is equipped with internal moving equipment, such as stirrers, agitators, pulverizers, fans, pressure locks, etc., disconnect or block the drive in addition to locking out power supplies.

3. Guard Openings

Guard each opened confined space against unauthorized entry (whether the space is normally open or is physically opened such that entry is possible) by one of the following methods. These guards must be in place, whether or not the space is intended to be entered.

a. Post a sign at all openings which reads "Danger – Permit Required Confined Space – Do Not Enter," or

b. Station a standby attendant at each opening through which entry is possible and direct the attendant(s) to prevent unauthorized entry. The attendant(s) must be positioned at the opening(s) for the entire time the confined space is open, not just while authorized entry is in progress.

The attendants must have completed Confined Space Entry Program Training and be certified as confined space entry attendants.

c. Ensure standby attendants barricade or otherwise guard all openings into the confined space such that employees cannot accidentally fall through the

opening and to ensure external objects cannot fall into the space and injure the entrants.

4. MSDS

Promptly provide copies of any applicable Material Safety Data Sheets to the rescue team if an entrant suffers from a chemical exposure related injury or illness. Material Safety Data Sheets are available through the Safety Department.

5. Entry Permits

a. GCI Confined Space Permits

Request Confined Space Entry Permits from GCI safety personnel. As a standard procedure, an GCI entry permit will not be issued until GCI personnel have established minimum requirements and issued an GCI Confined Space Entry Permit. If the affected GCI personnel determine that the location in question is not defined as a confined space according to their interpretation of the GCI Confined Space Policy, they may elect not to issue a confined space permit.

b. GCI Permit

Determine that the GCI entry permit contains all the required information and approvals, and that the necessary plans and equipment for safe entry are in effect before signing the permit and authorizing the entry.

c. Operations Monitoring

Determine, at appropriate intervals, that entry operations remain consistent with the terms of the Confined Space Entry Permits and that acceptable entry conditions are present.

It is the duty of the craft supervisor to cancel the entry authorization and terminate entry whenever acceptable entry conditions are not present.

d. Posting of Permits

Ensure that the completed permits are posted at the confined space entry point and that all required attachments are affixed to the permit.

6. Cancellation or Termination of the Entry Permit

a. Require the entrants to exit the confined space and cancel the permit if emergency conditions develop in the area of the job. Once a permit has been

canceled, a new permit must be issued before the space can be reentered. Conditions which lead to the emergency must be identified and eliminated or controlled prior to issuing the new permit.

b. Take the necessary measures for terminating an entry operation, such as closing off a permit space and canceling the permit once the work authorized by the permit has been completed. Canceling the permit involves signing the permit to indicate the job is closed and returning the permit to the GCI Safety Department.

7. Unauthorized Entry

a. Take the necessary measures to prevent unauthorized personnel from entering the confined space.

b. Remove unauthorized entrants if unauthorized entry occurs.

8. Rescue

a. If the confined space is a Permit Required Confined Space, verify that rescue services are available.

b. Ensure a documented rescue plan has been developed which will facilitate rescue from the specific confined space.

9. Training

Ensure all members involved with the job have been properly trained to perform their duties.

10. Procedures

Establish specific procedures for coordinating work and communication between all groups entering the confined space, including contractors.

11. Hazards

Know and recognize potential permit space hazards and monitor activities outside the permit space to determine if it is safe for entrants to remain in the space. This shall be monitored in conjunction with the assigned standby vessel attendants.

B. Project Safety Personnel

1. Confirmation Testing Prior to Entry

The safety representative will test the atmosphere of the space with a calibrated, direct reading instrument for oxygen content (21 percent), flammable vapors (0 percent), carbon

monoxide (PPM), and any other potential contaminant or condition identified by operations. These readings must be in the following ranges or the Confined Space Entry Permit will not be approved:

	Ventilation On	**Ventilation Off**
Oxygen	21%	20% to 23.5%
Flammables (LFL)	0% LFL	Less than 10% LFL
Carbon Monoxide (CO)	0 PPM	0 PPM
Other Substances	Less than PEL	Less than PEL

LFL – Lower Flammable Limit, PPM – Parts Per Million

PEL – Permissible Exposure Limit

Perform this test no more than 30 minutes prior to confined space entry and include the highest and lowest points within the confined space to detect different concentrations which could be caused by layering.

Record the results of all tests performed in the appropriate spaces on the Confined Space Entry Permit along with the time the tests were performed and the names(s) of the person(s) performing the tests.

2. Permit Approval/Certification of Conditions

   Eliminate all hazards from the confined space before the Confined Space Entry Permit is approved. If, with the ventilation equipment running, the oxygen content is not 21 percent or there are flammable vapors in excess of 0 percent LFL, or an IDLH (Immediately Dangerous to Life and Health) atmosphere is detected, the permit will not be approved.

   a. For concentrations below the PELs or other recognized limits, respiratory protection and other personal protective equipment may be used as desired for “comfort.”

   b. For concentrations at or above the established PELs or other recognized limits, personal protective equipment (PPE) which will fully protect the entrant is required. If a fault develops in the PPE in use, the affected person(s) must evacuate the confined space immediately.

3. Intermittent Testing

Perform a review of the Confined Space Entry Permit at regular intervals, not to exceed 12 hours (maximum time lapse), to determine that entry operation remain consistent with the terms of the entry permit and that acceptable entry conditions are present. This review process includes, but is not limited to, retesting the atmosphere with the confined space.

C. Attendant

A standby attendant must be stationed outside the confined space and must remain at the station at all times during the entry operations. Employees who work as standby attendants must complete the required confined space training qualifications to perform the duties listed below.

Confined spaces with multiple entry ports may require more than one attendant to perform the following duties. Attendants shall perform no duties that might interfere with the assigned responsibilities of the confined space attendant.

1. Monitoring

Monitor the entry and exit of entrants and continuously maintain an accurate count of all personnel in the space. Use the Confined Space Entry Log for this purpose.

Be able to properly use the atmospheric testing and monitoring equipment. Monitor the atmosphere within the confined space. The atmosphere must be manually tested for oxygen concentration, percent LFL, CO, and any chemical contaminants that have the potential for being present. Perform tests on a frequency agreed upon by the safety representative and craft supervisor. If the potential for a hazardous atmosphere exists, use continuous monitors with direct readout and audio/visual alarms for the detection of oxygen concentration, percent LFL, and carbon monoxide. Write the results of each test, the name of the tester, and the time the test was performed on the back of their permit.

2. Communications

Maintain effective and continuous communication with authorized entrants during entry operations.

3. Evacuation

Order the authorized entrants to evacuate the permit space immediately whenever any of the following occur:

a. The attendant observes a condition which is not allowed in the entry permit or detects behaviors of the entrants which could be attributed to hazard exposures.

b. The attendant detects a situation outside the permit space or within the permit space which could endanger the entrants.

b. The attendant must leave the work station.

4. Unauthorized Personnel

Keep unauthorized persons away from the permit space and request unauthorized persons to exit immediately if they have entered the permit space. When unauthorized entrants are directed to exit the space, notify the craft supervisor.

However, a standby attendant may not leave confined space work station to notify the craft supervisor unless all entrants have exited the confined space and the space entrance is secured to prevent accidental entry.

5. Rescue

Activate the emergency rescue plan as soon as it is determined that authorized entrants need to escape from permit space hazards. This may also include summoning the Rescue Service when a confined space entrant requires rescue assistance in exiting the confined space.

Establish and maintain direct communication capable of summoning emergency rescue responders. If emergency rescue of an entrant(s) is required, summon help by requesting:

"Safety Emergency"
State operating unit or street address
State confined space identify (tank 10, etc.)
State need for request (man down, person trapped, etc.)

DO NOT ENTER the permit space to attempt rescue of entrants. Properly use any rescue equipment provided and perform any other assigned rescue and emergency duties without entering the permit space.

D. Authorized Entrant

Only authorized entrants are permitted to enter or perform work in a confined space. Authorized entrants must complete the Confined Space Entry Program Training course in order to be qualified to perform their duties as follows:

1. Sign in/out on the Confined Space Entry Log to signify entry/exit of the confined space, and also to signify the authorized entrant has checked job conditions and has completed the Confined Space Entry Program Training.

2. Know the hazards that may be faced during entry, recognize the signs and symptoms of exposure to a hazard, and understand the consequences of exposure to each hazard.

3. Notify the attendant when any symptoms of exposure are recognized in any entrant or when a condition is noted that is in violation of the Confined Space Entry Permits.

4. Maintain contact with the standby attendant and notify the attendant whenever any entrant(s) initiates evacuation of a permit space.

5. Exit the permit space when the standby attendant orders evacuation, an automatic alarm is activated, when any symptoms of exposure are exhibited, when a condition in violation of the Confined Space Entry Permit is detected, or there is a threat of danger.

6. Be able to properly use the following equipment if required by the confined space entry job:

   a. Ventilating equipment,

   b. All associated communication equipment,

   c. Any personal protective equipment required,

   d. Any lighting equipment used,

   e. Any barriers or shields being used,

   f. Equipment used for entrance/exit (ladders, etc.)

   g. Any rescue equipment in place for entrant rescue (hoists, harnesses, wristlets, etc.), and

   h. Any other equipment necessary for safe entry and/or rescue.

X. EQUIPMENT REQUIREMENTS

The project safety office and the craft supervisor performing the task are responsible for all equipment necessary for safe entry, including testing, monitoring, communication, and personal protective equipment.

Following are guidelines for equipment used in confined space entry jobs:

A. Respiratory Protective Equipment

1. Persons entering a confined space may use respiratory protective equipment such as air line respirators, chemical cartridge respirators, dust and fume cartridge respirators, and disposable dust respirators. Use these devices for protection against contaminant concentrations that are below the established permissible exposure limits and are

within the capability of the respirator. An air line respirator with an integral escape self-contained breathing apparatus (SCBA) may be used to enter exposure limits or other recognized limits.

2. All persons using respirators shall have had documented respirator training.

B. Rescue Air

Whenever a rescue is required within a confined space, assume an IDLH (Immediately Dangerous to Life or Health) atmosphere exists. The availability of breathing air for rescue will expedite an effective rescue operation. Provide two or more independent supply sources of breathing air at the confined space entrance for the purpose of rescue. Approved sources of breathing air include a self-contained breathing apparatus (air pak) and/or a combination air line and self-contained breathing apparatus (hose line respirator including 5 minute escape pak) connected to a standard breathing air cylinder with at least 1500 psi pressure or an approved breathing air compressor.

Air paks should be utilized only if the entryway of the confined space is large enough (24 inches in diameter or greater) for entry by persons equipped with air paks.

C. Emergency Horn

Provide the standby attendant with a portable emergency horn for the purpose of ordering an evacuation.

D. Ladders

Use a ladder where entering or leaving a confined space involves a break in elevations of nineteen (19) inches or greater.

E. Electrical Equipment

All electrical equipment issued in confined spaces must be compatible with the potential conditions. All 120 volt circuits entering the confined space shall be protected Ground Fault Interrupter devices (GFIs). The devices must be located outside the confined space. Electric light extension cords must have fully insulated lamp holders and fully guarded bulbs. The guard must be grounded. Use explosion proof cord and light sets. Use low voltage light and cord sets (12 volts maximum) to prevent a shock hazard. Secure and tape any electrical connections made by extension cords to prevent disconnection or shock hazards.

F. Retrieval Equipment

Personnel entering a confined space shall use the retrieval and fall protection equipment and methods listed below except when the use of such equipment increases the overall risks of entry or does not contribute to the rescue. The

basis for an exception must be documented and attached to the permit. Exceptions must be approved by the Site Project Manager.

Entrants will wear approved full body harnesses. Do not use safety belts as a substitute. Wristlets may be worn with a harness but shall not be a substitute unless they are determined to be the best means of retrieval. The reasons for substituting wristlets must be documented and attached to the permit. Life lines shall be attached to the safety harness worn by the entrant(s). Attach the other end of the retrieval line to a solid anchorage point. In all confined spaces where retrieval equipment is required, the retrieval device shall be properly installed at the entry site to retrieve personnel from confined spaces greater than 5 feet in depth. When a confined space requiring a mechanical hoist involves the entry of more than one employee, one employee's retrieval line must be attached to the hoist and all other entrants' lines must be attached to a fixed point outside the confined space. The hoist must be designed so that after extracting each employee from the confined space, the retrieval lines of subsequent employees can be attached to the hoist and the entrants subsequently removed.

In addition to the above requirements, all retrieval and personnel equipment must meet applicable state and federal standards.

G. Oxy-Acetylene Hoses

Hoses shall be fully pressurized and checked for leaks prior to entry by complete immersion into water. The supervisor charged with the confined space operation shall direct and witness the test. This requirement applies to all hoses that are placed inside confined spaces. Hoses shall be placed inside the confined space only when needed and immediately removed when the task requiring the hose is completed. Torch barrels and heads shall be attached to the oxygen/acetylene hoses and included in the leak check process.

In addition to the above requirements, only oxygen/acetylene hoses designated specifically for confined spaces shall be used inside confined spaces. The hoses shall be equipped with in-line "shutoff" valves that shall be positioned at the location of the standby attendant.

All hoses must be re-checked at the beginning of each shift.

H. Other Required Equipment

Ventilation equipment shall be capable of providing at least four exchanges of air per hour, by volume, within the confined space.

Note: Plant air shall not be used as the source for ventilation equipment.

The atmospheric testing equipment shall be calibrated, direct reading devices capable of detecting oxygen concentration, percent LFL, and PPM carbon monoxide. When an actual or potential hazardous atmosphere exists within the confined space, continuous monitoring of the space atmosphere is required. The continuous monitors must be equipped with audio/visual alarms.

A radio or other suitable method of direct communication shall be provided to summon help in the event a rescue is needed.

XI. CONFINED SPACE ENTRY TRAINING

Use the Confined Space Entry Training course to train GCI employees for confined space entry. At course completion, verify through skill checks that the employees have the understanding, knowledge, and skills to perform the duties associated with a confined space job.

Certify employees completing the training course as trained for completing their assignments (Entrant, Attendant, or Entry Supervisor) associated with confined space entry. File the certification in the project safety office and make it available for inspection by employees and/or their representatives.

Annually train the rescue service and certify their completion of training. The certification and course outline is available for review by employees and/or their representatives.

XII. DEFINITIONS

A. **Confined Space** – A confined space is a space that:

1. Is large enough and so configured that an employee can enter with his/her whole body.

2. Has limited or restricted means for entry or exit, and

3. Is not designed for continuous employee occupancy.

B. **Non-Permit Confined Space** – A Non-Permit Confined Space is a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. A Confined Space Entry Permit form is required.

C. **Permit-Required Confined Space** – A Permit-Required Confined Space is a confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere.

2. Contains a material that has the potential for engulfing an entrant.

3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward.

4. Contains any other recognized serious safety or health hazards.

D. **Authorized Entrants** – Authorized entrants are GCI employees who will actually enter a confined space to perform work. Employees entering a confined space must be trained in the Confined Space Entry Program in order to recognize signs and symptoms of exposure, understand the consequences

of exposure to hazards, know how to use any needed equipment, know how to communicate with the standby attendant, and know how to exit whenever ordered or alerted by alarm, warning sign, or prohibited conditions to do so.

E. **Attendants** – Attendants are GCI standby vessel attendants. Attendants must be trained in the Confined Space Entry Program. Attendants must know the hazards of the confined space, remain outside the space until relieved, communicate with entrants to monitor entrants' status, monitor activities inside and outside the permit space, order exit if required, summon rescuers, prevent unauthorized entry into confined space, and perform non-entry rescues if required.

F. **Entry Supervisor** – Entry supervisors are GCI craft supervisors who are responsible for issuing and monitoring confined space work along with the Safety Department. Supervisors are responsible for verifying that all tests have been conducted and that all procedures and equipment are in place. Supervisors must also know the hazards of the Confined Space before endorsing a permit, terminating a permit if necessary, canceling a permit, and verifying that rescue services are available.

G. **Rescue Services** – Rescue services will normally be provided by the client in operating facilities and should be utilized when available. In the event rescue services are not provided by the client, GCI may use trained and certified vessel attendants or a designated rescue team. The rescue team must be properly equipped and must receive the same training as authorized entrants and supervisors, plus training in the use of personal protective and rescue equipment and in first aid including CPR. Rescue teams must practice simulated rescues at least once every 12 months.

H. **Retrieval System** – Retrieval system means the equipment used for non-entry rescue of persons from permit spaces including a retrieval line, chest or full body harness, wristlets, if appropriate, and a lifting device or anchor.

I. **Training** – Initial training is given to provide employees the necessary understanding, skills, and knowledge to perform the job safely. Refresher training must be conducted whenever an employee's duties change, when hazards in confined space change, or whenever an evaluation of the Confined Space Program identifies inadequate employee knowledge. Employee certification of training must include employee's name, trainer's signature, and the dates of training.

CRANE HOISTED PERSONNEL PLATFORMS

I. PURPOSE

To ensure compliance with the requirements concerning crane hoisted personnel platforms established in the OSHA Construction Standard, 29 CFR, Part 1926.550(g).

II. SCOPE

Use of crane hoisted personnel platforms is prohibited, except where other means of reaching an elevated work location are more hazardous or not feasible because of structural design or work site conditions. Safety of the employees performing the work in an elevated location is to be the only factor to be considered in deciding whether or not to use a crane hoisted personnel platform on this project.

III. AUTHORIZATION

The use of crane hoisted personnel platforms must be approved in writing on a case by case basis. The Project Manager or his designee must give the required approval. Designees must hold the active position of General Manager or equal and be so named on file in the Project Safety Office. Designees should be kept to an absolute minimum.

IV. TRAINING

All personnel involved in crane hoisted personnel platform operations shall be given detailed training in the content of the 1926.550 (g) Standard. This training shall be conducted and documented by the Project Safety Department. Personnel who will perform work from crane hoisted personnel platforms shall receive applicable instruction on hazards and precautions to be taken during hoisting. This instruction shall be given immediately prior to the trial lift. Personnel required to attend this training but are not limited to:

A. Persons designated to approve platform use,

B. Persons inspecting and certifying baskets, rigging, and cranes used in personnel hoisting operations,

C. Persons authorized to witness pre-lift tests, and

D. Persons authorized to flag or signal cranes.

V. PERMITTING

A. A written permit must be obtained for each use of a crane hoisted personnel platform.

B. The permit shall be initiated by the craft performing the elevated work requiring a crane hoisted platform.

C. The permit must describe the work to be performed and its exact location.

D. The permit must be signed by the person on the project authorized to approve crane hoisted personnel platform use.

E. The permit must acknowledge all required inspections, tests, and pre-lift meetings and these must be witnessed by and signed for on the permit by the crane operator, rigging supervisor, the requesting craft supervisor responsible for the work, and a member of the Project Safety Department.

F. The person who will flag or signal the crane operator shall be noted by name on the permit.

G. A permit will be good only the day on which it was issued.

H. A permit is good only for lifts made from a single crane setup location. Movement (traveling) of a crane voids permits.

I. A copy of the permit shall remain with the crane while the personnel hoists are in progress and a copy will be placed on file at the Project Safety Office.

VI. PRE-LIFT MEETING

A. Shall be held after approval has been given for crane hoisted personnel platform use.

B. Attendees at this meeting must include but are not limited to:

1. Crane Operator,

2. Rigging Supervisor,

3. Requesting Craft Supervisor,

4. Safety Representative,

5. Flagman/Signal Person (designated), and

6. Workers to be hoisted.

C. Activities to be completed at the pre-lift meeting include:

1. Required crane, rigging and platform inspections,

2. Functional test of anti-tube block device.

3. Test lift with sample weight,

4. Safety instruction for workers, and

5. Permit signing and issuance.

VII. CRANE REQUIREMENTS

A. Cranes which do not comply with the requirements of 1926.550(g) shall have a sign posted at the access door to the operator's station and in plain view of the operator at the operator station, which states "Not Approved For Personnel Hoisting."

B. Platforms shall be suspended only from cranes that have power up and power down capability (controlled load lowering). Free falling platforms are prohibited.

C. Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

D. The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

E. Cranes with telescoping booms shall be equipped with a device to indicate at all times the boom's extended length or an accurate determination of the load radius to be used during the lift.

F. Cranes and derricks with variable angle booms shall be equipped with boom angle indicators.

G. The platform shall be attached to the load block or hook, not directly to the load cable.

H. The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius.

I. Load lines shall be capable of supporting at least seven times the maximum intended load. Non-rotating cable shall be capable of supporting at least 10 times the maximum intended load.

J. The crane operator shall remain at the controls at all times when the platform is occupied.

VIII. CRANE INSPECTION

The crane shall be inspected immediately prior to suspending a work platform. Inspection shall include wire rope, hook, brakes, and other mechanical and rigging equipment vital to the safety of the operation.

IX. RIGGING

A. Wire rope, shackles, rings and other rigging hardware must be capable of supporting at least five times the maximum intended load.

B. All eyes in wire rope slings shall be fabricated with thimbles.

C. Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for hoisting the platform and employees, their tools and the materials necessary to do their work and shall not be used for any other purpose when not hoisting personnel.

D. Hooks on overhaul ball assemblies, load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening.

E. A steel wire sling (safety line) capable of supporting the weight of the basket and occupants shall be attached from the load line just above the “headache” ball to the eye of the lifting lug on top of the basket.

F. At each job site, prior to hoisting and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform’s rated capacity by holding it in a suspended position for 5 minutes.

X. CRANE SETUP AND OPERATION

A. A meeting attended by the crane operator, signal person, employees to be lifted and the person responsible for the task shall be held to review the appropriate requirements.

B. The crane shall be uniformly level within 1 percent of level grade and located on firm footing. Crane outriggers shall be fully deployed and rubber will be clear of the ground.

C. A visual inspection of the crane, rigging, personnel platform and ground shall be conducted by a competent person.

D. A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight shall be made from ground level, or any location where employees will enter the platform, to each location which the platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel in the platform.

E. At this time, the crane operator shall determine that all systems, controls, and safety devices are activated and functioning properly, that no interferences exist, and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist’s rated capacity.

F. Materials and tools to be used during the actual lift can be loaded for the trial lift.

G. A single trial lift may be performed at one time for all locations that are to be reached from a single setup position.

H. The trial lift shall be repeated prior to hoisting employees whenever the crane is moved and set up in a new location, or returned to a previously used location.

I. After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches, and inspected to ensure that it is secure and properly balanced.

J. Employees shall not be hoisted unless the following conditions are determined to exist:

1. Hoist lines shall be free of kinks,

2. Multiple part lines shall not be twisted,

3. The primary attachment shall be centered over the platform,

4. The hoisting system shall be inspected, and

5. Ground area to be inspected.

K. Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions.

L. Employee being hoisted shall remain in continuous radio contact.

M. No lifts shall be made on another of the crane's load lines while personnel are suspended on a platform.

XI. PLATFORM REQUIREMENTS

A. Design shall provide a minimum design safety factor of 5.

B. An access gate that swings inward and is equipped with a positive latch shall be provided.

C. A grab rail shall be inside the entire perimeter of the personnel platform.

D. Head room shall be provided to accommodate two people, and high enough to provide protection around the perimeter to at least 6 feet 6 inches.

E. Platform weight and rated capacity shall be permanently marked on the platform.

F. Perimeter protection shall consist of a top rail approximately 42 inches high, a toe board at least 4 inches high, and midrail approximately halfway between top rail and toe board, and enclosed from top rail to toe board with expanded metal having openings no greater than ½ inch.

G. The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

H. Provision shall be made for tying off safety harness lanyards inside the protected perimeter and for securing tools to prevent displacement.

XII. SPECIFIC SAFETY REQUIREMENTS

A. Physical condition, ability to work at heights, and similar items shall be considered in selecting personnel for work in crane baskets.

B. Safety harnesses shall be worn and tied off to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

C. When working over water, safety harnesses are not required; however, life vests and safety boat are required.

D. The crane boom, personnel basket and other crane parts must be kept at least 20 feet from any high voltage line. Any exception to this rule must be jointly approved by the Project Manager and Safety Department.

E. Tag lines shall be used unless their use creates an unsafe condition.

F. Personnel shall not stand on rails or anything other than the floor of the platform.

G. Area below platform shall be barricaded.

H. Platform shall not be used for bulk handling of material.

XIII. GENERAL SAFETY REQUIREMENT

All equipment used to hoist personnel by means of crane hoisted platforms shall comply strictly with the requirements of 1926.550(g).

ENERGY ISOLATION

I. PURPOSE

A. This procedure is to establish a uniform practice to be used in the tagging and locking, for safety purposes, all energy sources (i.e., electrical switches, MOVs, valves, blinds, controls, etc.), while installation, maintenance inspection and/or construction operations are in progress.

B. Quarterly audits of the GCI Energy Isolation Procedures shall be conducted.

II. POLICY

A. All GCI and contract employees will follow the procedures outlined below to secure equipment before work begins and to prevent inadvertent startup of equipment before work is completed.

B. As of November 1, l989, any new or renovated equipment must be capable of accepting a lockout device.

III. DEFINITIONS

A. Personal Lock – A lock assigned to an employee that is individually identified and keyed. This lock will only be installed and removed by the assigned individual and shall remain in place while the individual is performing work on the isolated equipment. (MOC Color Coded Black)

B. Equipment Isolation Lock – Locks assigned to the owning department for the purpose of isolating equipment. These locks will be placed on breakers, valves, blinds, etc., and only one key will operate each lock.

C. Department Locks – Locks assigned to the owning department for placement on the lockbox. These locks do not have any key restrictions, although only supervisors would possess these keys. Operations uses a Best OA lock and Product Control uses a Blue No. 1 Master Lock.

D. Lockbox – A box secured by personal and department locks which prevents access to the keys for the equipment isolation locks inside.

IV. PROCEDURES

A. Appropriate locks, keys and tags shall be issued to all employees who may have occasion to work on electrical or other types of equipment that could have a sudden release of energy. Locks will be issued as personal loaned equipment. There is to be only one key for equipment isolation locks and each personal lock shall be individually keyed. Exception: Department locks used for lock boxes.

1. The operating departments will maintain an inventory of locks, tags, and chains as necessary.
2. Contractors must be capable of applying personal locks and tags as required.

B. The following procedures must be used to ensure the safety of all personnel:

1. An Energy Isolation List must be prepared by the Project Manager. Refer to Figure A following this section. The list must contain all points of isolation (i.e., breakers, valves, blinds) and be returned with the appropriate work permit.

2. All lockout/tagout requirements must be stated on the appropriate work permit.

3. Observe equipment run lights or other indicators to determine that equipment is not energized.

4. Turn off local or equipment switch prior to de-energizing the breaker.

5. Lockout is to be made at the breaker or disconnect, not at a local switch. If the breaker is not capable of accepting a lock, a circuit breaker lockout is to be installed. If the breaker provides power to several pieces of equipment, and the breaker must remain energized, a tag should be installed on the closed switch, then the power lines to the equipment shall be disconnected by a qualified electrician.

   a. In order to isolate diesel driven pumps, the engine's battery cables must be disconnected, taped to prevent easy re-attachment, and tagged.

6. All valves used as isolating devices shall be chained and locked in the closed position. Normally, valves will remain closed during an operation; however, if a valve is to be reopened and a blind is used as the only isolation device, the blind shall be chained and locked. (Refer to Procedure – Blinding, for specific requirements.)

7. When the equipment has been de-energized/isolated, the Project Manager or his designated representative will secure all breakers, valves, or blinds by placing equipment isolation locks on the handles of the switch gear, chained valve wheels or blinds. The locking device will be put on in a manner that will prevent movement of the handle to the on or open position or the removal of the blind.

8. A "DANGER – DO NOT OPERATE" tag will be attached to the equipment isolation lock. The tag will be clearly dated and signed with a brief description of the purpose of the lockout.

9. With the start button depressed, or by other positive means, observe that the equipment cannot be energized.

10. All keys to the equipment isolation locks, in addition to the Energy Isolation List, shall be placed in a lock box located at the Operator Shelter or work site.

11. The Project Manager or his designated representative will place a departmental lock and tag on the lock box. This lock will be the last lock removed prior to putting the equipment back in service.

12. Each Craft or Contractor Supervisor/Foreman shall verify that all isolation devices identified on the Energy Isolation List have been locked out and that all keys for

equipment isolation locks are secured in the lock box. The Supervisor's signature on the work permit shall indicate that the verification has been conducted. The personnel performing the work shall be given the opportunity to conduct this verification as well, if requested.

13. Each individual shall place his own personal lock on the lockbox prior to beginning work on the isolated equipment and remove it at the end of his shift, unless the work is completed before the end of the shift. If he is relieved while the job is in progress, he will remove his lock and his relief will replace it with his own lock. (Refer to Figures A and B following this section for examples of isolation.)

14. The craftsman will notify the Project Manager when the job has been completed and his lock removed.

15. The completed job will be inspected by the Project Manager. He will determine that no one is still working on the equipment and that it is ready to operate. After ensuring that the local switch is in the "off" position, he may then remove his department lock and the equipment isolation locks, and energize the circuit.

16. If for any reason a lock has been inadvertently left on the lockbox, the Project Manager must make every attempt to have the craftsman remove his own lock. Only as a last resort, and after he has determined that the equipment is mechanically sound, will the Maintenance Supervisor remove the lock by other means (bolt cutters, etc.)

17. If lockouts are to remain on equipment for an extended period, such as when a pump is removed 1 day and installed a week later, the breaker will remain locked out. The craftsman only may remove his lock and re-attach it when returning to complete the work.

18. Each Project Manager and Contractor will maintain its own locking system. All locks will clearly identify the user by name.

19. The use of lockout devices shall not be used on personal lockers, cabinets, tool boxes, etc.

V. EXCEPTIONS

A. When it becomes necessary to troubleshoot electrical or other equipment while it is energized, the craftsman will take the necessary precautions and utilize his skills, instruments, training and safe procedures to prevent exposure to him or others.

B. During inert entries, it will be necessary to maintain a nitrogen purge on the vessel.

C. Unit Turnarounds/Shutdowns

During unit turnarounds/shutdowns, it will be the Project Manager's responsibility to turn the breakers not being used in the "off" position, and attach a tie-wrap and a "DANGER—DO

NOT OPERATE" tag deeming that electrical source secured. These two safety items would remain on the energized switch for the duration of the turnaround.

When it becomes necessary to perform work on equipment, it will become the responsibility of the craftsmen to obtain a permit from the Project Manager. The Project Manager will first develop an Energy Isolation List, then place a lock on all required isolation points (valves, breakers, blinds) securing that piece of equipment with their own lock. All employees working under the energy isolation must sign on and off the work permit on each shift verifying all energy sources have indeed been isolated or de-energized. As the work is completed, the employees will sign off the work permit and the locks will be removed by the respective crafts.

Also, during a unit turnaround/shutdown, the operations involve large numbers of employees, several isolation devices and multiple shifts; therefore, verification surveys by unit shall be conducted prior to each shift. The Project Manager or designated representative) will conduct the survey and sign an Isolation Verification-Sign on/Sign off sheet upon completion. The signed Isolation Verification-Sign on/Sign off sheet and work permit will be posted at the work site for employee's signature.

1. Preventive Maintenance (PM)

   Preventive maintenance work will also be performed on various electrical breakers during the turnaround. A general permit will be issued by Operations on a daily basis.

2. Testing or Energizing

   No breaker will be tested or energized without one GCI employee by the piece of equipment being energized. No tie-wrap, lock, or "DANGER—DO NOT OPERATE" tag will be removed by anyone other than the Operations Department personnel.

3. Relocation of Electrical Breakers

   In the scope of electrical work, some motor starters may be relocated to other substations. When a breaker is to be moved to another substation, the operation tag will be removed by the operator in that unit. After the breaker is relocated, the operator who is responsible for that substation will then put his tag to secure the relocated hardware. After relocation, the same rules should apply to testing and energizing of electrical sources.

   This procedure is intended for all energy driven equipment that could cause injury to personnel or danger to equipment. Typical among these are mechanical, hydraulic, electrical, thermal, pneumatic and spring-loaded devices. Should an occasion arise that is not specifically covered by this procedure, all employees shall be guided by its intent.

VI. ELECTRICAL HEAT TRACING

When working on equipment with electrical heat tracing, the tracing shall be isolated prior to beginning work by turning the breaker to the "off" position and locking it out. A tag shall also be attached.

VII. FUSE REMOVAL

A. When working on equipment and fuses must be pulled, the following procedures must be followed.

1. Fill out a lockout tag with the following information.

   a. Fuse Box Number.

   b. Fuse Number.

   c. Description of fuses to be pulled.

2. The individuals working on the equipment shall sign the tag.

3. The tag shall be displayed on the front of the affected fuse box.

STEPS REQUIRED FOR ENERGY ISOLATION OF A PUMP

FIGURE A

The Project manager prepares the pump for maintenance and develops an Energy Isolation List.

The Project Manager turns the breaker to the “off” position, then installs an equipment isolation lock and a “DANGER-DO NOT OPERATE” tag on the breaker.

The suction and discharge valves are closed, chained, locked with an equipment isolation lock, and tagged by the Project Manager.

The equipment isolation lock key(s) are placed in an energy isolation lockbox along with the Energy Isolation List. The lockbox may be located at the immediate work site or a central location as long as it is accessible to all affected employees.

The Project Manager places a departmental lock and tag on the lockbox. Anyone working on the pump shall place a personal lock on the lockbox before beginning work and remove it upon completion.

NOTE; ALL LOCKS PLACED ON THE LOCKBOX MUST BE LABELED TO IDENTIFY THE OWNER OF THE LOCK.

STEPS REQUIRED FOR ENERGY ISOLATION OF A VESSEL.

FIGURE B

The Project Manager prepares the vessel for entry and develops an Energy Isolation List.

The Project Manager locks out and tags any electrical equipment at the breaker.

All valves are closed, chained, locked with an equipment isolation lock and tagged by the Project Manager. Blinds utilized for energy isolation shall also be chained, locked, and tagged.

The equipment isolation lock key(s) are placed in an energy isolation lockbox along with the Energy Isolation List. The lockbox may be located at the immediate work site or a central location as long as it is accessible to all affected employees.

The Project Manager places a departmental lock and tag on the lockbox. Anyone working in the vessel shall place a personal lock on the lockbox before entering and remove it upon exiting.

NOTE: ALL LOCKS PLACED ON THE LOCKBOX MUST BE LABELED TO IDENTIFY THE OWNER OF THE LOCK.

WORK NEAR OVERHEAD ELECTRICAL LINES

I. PURPOSE

This procedure outlines the minimum requirements for work in proximity to overhead electrical lines. It is intended to protect individuals, materials and equipment from accidental contact or arcing of electrical lines.

II. SCOPE

Since the OSHA Regulation 1926 (revised 1991) provides limited guidance on distance criteria for employees working around service lines (as defined below), the following criteria will be used on this project, and is based on standards outlined in 1926.402, Table K-1 (page 140) for nominal voltages below 600 volts. This standard defines working space required around exposed live circuits below 600 volts. For our purposes, we shall use these same distances for personnel working around energized electrical lines; however, the criteria will apply only to insulated lines below 480 volts.

NOTE: Unless otherwise stated, all references listed in parentheses are from OSHA Regulation 1926, revised 1991.

III. GLOSSARY/DEFINITIONS

A. *Electrical Line*: The term electrical line includes any suspended power lines, communication lines or telephone lines. There are four basic types of electrical lines:

1. *Transmission Lines:* High voltage lines that carry power from the Generating Station to the Distribution Substations.

2. *Distribution Lines:* High voltage lines that carry power from the Distribution Substations to the pole transformers for the service drop.

3. *Service Lines:* Low voltage lines that carry power from the pole or other transformers to the service-entrance conductors (1926.449 – Definitions). For the purpose of this project, the definition of a service line includes the above service line data and additionally cannot be above 480 volts. Any line that does not meet this criteria will be regarded as either a transmission or distribution line. Any time work is to be done around electrical lines, call the Project Manager to verify the voltage, or treat it like it is over 480 volts. The Foreman, General Foreman and Superintendent responsible for the work being accomplished will be held personally responsible for this criteria and its enforcement.

4. *Low* Voltage Lines: Low voltage lines (less than 100 volts) that carry communications, signal or other low voltage current.

B. *Proximity* (pertaining to equipment): When equipment must be set up or operated within 20 feet of the drip line of an energized distribution, transmission or service electrical line under 50kV (1926.550.a.15.ii), it will be considered in proximity to the line. The 20 foot limit also includes any loads suspended from equipment. When equipment must be set up or operated within 20 feet of the drip line of an energized service line, it will be considered in proximity to that line. If working around energized lines over 50 kV, contact the Safety Department for distance criteria before starting operations. Equipment in transit shall not pass within 10 feet of an electrical line greater than 480 volts.

C. *Proximity* (pertaining to personnel): When personnel must work or handle materials that will come within 20 feet of an energized electrical line, they will be considered in proximity to the line. The Proximity Permit will not allow personnel any closer than the following distances for the listed voltages:

1. *Over 480 volts:* No closer than 20 feet to an insulated line; no closer than 20 feet for an uninsulated line.

2. *100 volts to 480 volts*: No closer than 3 feet to an insulated line; no closer than 20 feet for an uninsulated line.

3. *Under 100 volts:* No closer than 3 feet for an insulated or uninsulated line.

D. *Proximity* (pertaining to material): When material must be used or stored within 20 feet of an energized electrical line (calculated the same as for personnel), it will be considered in proximity to the line. The Proximity Permit will not allow personnel any closer than the same distances allowed for personnel in the above paragraph.

IV. RESPONSIBILITIES

The following personnel shall be notified in advance when a job will require work in proximity to an overhead energized electrical line. When possible, notification should be given at least 3 days in advance of the work. Correct identification of overhead electrical lines is vital. There is considerable resemblance between some high voltage lines and "Telephone" lines. In all cases, call the Project Manager for verification of the voltage or assume it to be a distribution or transmission line.

A. Craft Superintendent or their designated representative in charge of the work being done.

B. Craft Superintendent or designated representative in charge of the equipment.

C. Field Engineer (not required for less than 480 volts; at the discretion of permit authority over 480 volts).

D. Electrical Superintendent or designated representative.

E. Safety Supervisor or designated representative.

NOTE: These individuals will determine what precautions will be required.

IV. POWER OUTAGE REQUESTS

The first option for all work in proximity to an energized distribution or transmission line of less than 50 kV will be a power outage. ANY work around one of these lines without a power outage is to remain 20 feet outside the drip line of the concerned power line unless it is specifically approved in advance by Project Manager. For work around lines greater than 50 kV, contact the Safety Department for distance criteria before beginning work.

Power outages are desired for service line operations also. If not possible to attain, all work must conform strictly to Permit specifications.

The Craft Superintendent responsible for the work will notify the Project Manager who will fill out and submit a power outage request to the appropriate GCI representative.

Request forms shall be submitted a minimum of 3 days in advance, whenever possible. If submitted less than 3 days prior to the work, specific reasons must be provided to demonstrate why the submittal cannot be met.

VIII. FLAGGING REQUIREMENTS

The Project Manager or designated representatives will determine flagging requirements. As a MINIMUM, a qualified electrician must be posted when working in proximity to energized lines over 480 volts. Flagman requirements for lines from 100-480 volts will be at the discretion of the Project Manager. The electrician shall be thoroughly briefed on permit requirements prior to starting work. The designated electrician will be given the authority and responsibility to stop work at any time he deems the operation unsafe.

IX. OPERATOR INSTRUCTIONS

Prior to starting activities, equipment operators will be instructed by the equipment supervisor to remain on the equipment in case of contact with any electrical line. No personnel shall come into contact with the equipment until the lines have been de-energized.

X. EXCEPTIONS TO THIS PROCEDURE

Any deviation from this procedure will require the approval of the Project Manager or his designee in advance of any work being done.

EYE PROTECTION POLICY

I. PURPOSE

The purpose of this procedure is to establish the minimum requirements concerning the personal protective equipment that employees shall use to prevent eye injuries.

II. SCOPE

Safety glasses with side shields shall be worn at all times while employees are inside the GCI site or any offsite area where construction work is in progress. The only exceptions are offices, meeting rooms and rest rooms.

III. SPECIFICATIONS

A. Safety glasses shall comply with the ANSI Z87.1 Standard.

B. Lenses must be marked with the manufacturer's trademark in the upper corner.

C. Frames must have the manufacturer's trademark on the front or side temples, and Z87 stamped on the frame.

D. Contact lenses shall not be worn by employees.

IV. ADDITIONAL EYE PROTECTION

A. Face shield will be required for the following:

1. Grinding (personnel in the immediate vicinity of grinding operations must also wear monogoggles).

2. Chipping.

3. Cutting, breaking, reaming, or drilling any materials where a flying chip hazard exists.

4. Handling molten lead, hot asphalt or hot resins.

5. Initial opening of lines and equipment.

6. Using air or high-pressure water to clean materials.

7. Using irritant chemicals (chemical splash goggles shall be worn for protection from liquids such as hydrocarbons, acids and caustics.)

B. Face shield are required while operating a skill saw.

C. An approved welding shield, with no less than a #10 density filter plate and safety lenses on both sides, will be required for all welding operations.

D. Burning goggles are required for all gas burning operations. Goggles shall have no less than a #4 density filter plate with safety lenses on both sides.

E. Face shields are to be worn while using impact wrenches, including personnel holding backup.

F. Supervision may identify other tasks which require special eye protection.

G. Helpers and co-workers assisting with a task that requires eye protection are also required to wear protection in line with the work being performed.

FALL PREVENTION

I. PURPOSE

To provide guidelines for maximum protection for all personnel against falls.

II. SCOPE

Achieve 100 percent Fall Protection for all personnel when working in areas that present fall exposure by placing into service various fall arrest systems.

III. RESPONSIBILITY

Project Management and front line supervision are responsible for supporting and enforcing this program to ensure 100 percent compliance by all personnel. The Safety Department shall have full authority to ensure 100 percent enforcement of the program. The Safety Department's primary responsibility, however, will be to support crafts, to monitor the program for compliance, and to advise Project Manager.

IV. PROCEDURES

A. All personnel on this project will be required to wear an approved full body harness and shock absorbing lanyard with double action snaps. The following equipment will be utilized:

1. Fully Body Harnesses.

2. Shock Absorbing Lanyards.

3. Wire Cable Lanyards with Shock Absorbers.

B. Welders will be required to use the wire cable lanyards with shock absorbers if there is a possibility of lanyard damage from the welding process.

C. Crafts/departments shall make maximum use of primary fall protection systems such as scaffolds, aerial lifts, personnel hoists, etc. These systems shall be equipped with complete working/walking surfaces free of floor openings, standard guardrail systems, and a safe means of access.

D. Personnel traveling or working in areas where a fall exposure exists shall make use of secondary fall protection by securing their safety lanyard at all times to a structure, lifeline, or approved fall arresting device capable of support 5,400 pounds.

E. Personnel working from or traveling in powered work platforms or personnel lifting/hoisting devices shall also properly secure their safety lanyards as noted below.

F. Fall protection devices such as lifelines, safety harnesses/lanyards, etc., shall be inspected on a regular basis for damage and/or deterioration. Defective equipment shall be removed from service and destroyed, or in some cases, repaired.

G. Fall protection devices subjected to shock loadings imposed during fall arresting shall be removed from service and the Safety Department notified.

H. Fall protection devices and systems shall not be used for any other purpose other than employee safeguarding.

V. PRIMARY FALL PROTECTION SYSTEMS

A. Temporary work platforms provide walking and working surfaces in elevated areas which are free from floor openings and are equipped with standard guardrail systems on all open sides and with closure apparatus for ladder openings or other points of access when required. These systems include but are not limited to: scaffolds, pencil boards, aerial lifts (JLG, scissor lifts, etc.) and other approved personnel hoisting devices.

B. Standard guardrail systems shall be constructed according to the specifications described in Procedure – Barricades and Guardrails, Section D of this manual. These systems are used to guard open sides of floors, platforms, open holes, excavations, and walkways that present a fall exposure to personnel.

C. Floor and wall opening protection shall be constructed according to the specifications outlined in Procedure – Spill Response of this manual.

VI. SECONDARY FALL PROTECTION SYSTEMS

A. Safety Harness/Lanyard Systems must be worn and used as a backup to primary fall protection systems noted above and when the work location is not provided with a primary system. Only safety harnesses/lanyard systems furnished by GCI may be used on this project. Personal safety harnesses/lanyard systems may not be used.

B. The fall protection lanyard shall be the shock absorbing type and attached to the D-ring located in the middle back of the safety harness. Lanyard snap hooks must be the double action type.

C. D-rings located at the waist may only be used for positioning and with rail type ladder climbing devices.

D. Positioning lanyards are to be attached to D-rings at the waist belt location and be supported by an appropriate work belt. Positioning lanyards need not be of shock absorbing type and must not be used for fall protection. The positioning lanyard must always be backed up by a properly secured shock absorbing fall protection lanyard.

E. Lifeline systems are points of attachment for fall protection lanyards and must be capable of supporting at least 5,400 pounds. Lifelines may be mounted either vertically or horizontally

and are generally intended to provide mobility to personnel working elevated areas. Lifeline shall not be used for any purpose other than fall protection.

F. Safety nets may be used in some situations as secondary fall protection. Use and installation of nets when required will be under direction of the Safety Department.

G. Connector's toggles connect to structural steel bolt holes to provide an attachment point for a safety lanyard. These devices are to be used by structural iron connectors and boltup personnel during steel erection.

H. Concrete form tie-offs attach to patented concrete forms to provide an attachment point for safety lanyards. These devices are to be used when placing concrete forms at elevations where a fall exposure exists.

VII. LIFELINE PLACEMENT/INSTALLATION

A. Horizontal Lifelines

1. All horizontal lifelines shall be attached to skeletal steel structures (e.g., pipe racks, etc.). Lifeline material shall be 3/8 inch cable as a minimum and shall be secured on each end by at least three cable clamps. Lifeline cable clamps will be painted fluorescent orange for easy identification. Only fluorescent orange clamps shall be used for securing lifelines. Intermediate supports shall be adequate to minimize sag and vertical deflection under loading.

2. Horizontal lifelines shall be installed and maintained.

3. Priority shall be given to lifeline placement as structures are erected.

4. Lifelines shall be arranged to provide adequate mobility in all areas of the structure while maintaining 100 percent Fall Protection for personnel.

5. Lifelines shall be arranged to provide tie-off points at least waist high for personnel using them.

6. Lifelines shall not be used for any purpose other than fall protection.

7. Personnel installing lifelines shall be protected from falls at all times by use of retractable reels or tie-off to structural steel, etc.

8. Project Manager shall schedule regular documented inspections of all lifelines at least weekly.

B. Vertical Lifelines

1. Static rope lifelines shall be of synthetic fiber rope approved by the Safety Department.

2. Static rope lifelines must be used with approved rope grabs for lanyard attachment.

3. Static rope lifelines must be anchored at the tope by means capable of supporting 5,400 pounds.

4. Softeners shall be used where lifelines contact sharp edges such as bean flanges.

5. Static rope lifeline/rope grabs will be placed for each person working from or riding in spyders/ski-climbers or two point suspension scaffolds. Each person must have an individual lifeline.

C. Retractable Reel Lifelines

1. Retractable lifelines shall be installed by a designated qualified person selected by the Project Manager. After installation and before use, the device must be inspected by the responsible foreman.

2. Retractable lifeline devices shall be attached to supports capable of supporting 5,400 pounds.

3. Retractable lifeline devices shall be secured by means of shackles and ½ inch wire rope chokers. Only 5/8 inch allow anchor shackles shall be used. ROPE (synthetic or natural fiber) SHALL NOT BE USED TO SECURE THESE DEVICES.

4. Each retractable lifeline device shall be equipped with a rope tag line for extending the device to elevations below the point of attachment.

5. Retractable lifelines shall be placed at the top of every temporary construction ladder which is to be used for repeated access to elevations provided that the personnel shall access an elevation of 24 feet or greater.

6. Retractable lifelines shall also be used to provide fall protection to structural iron workers during erection prior to installation of other fall protection systems.

VIII. LADDERS

A. Permanent caged structural ladders may be ascended or descended without additional fall protection.

B. Temporary construction ladders shall extend at least 36 inches above their uppermost landing and be secured against displacement.

C. When ascending or descending ladders, personnel shall maintain three points of contact with the ladder. Materials or tools shall not be carried in hands while using ladders.

D. All temporary construction ladders more than 12 feet in height and used for repeated access/egress to elevations shall be equipped with retractable lifelines. Personnel using these

ladders shall secure the retractable lifeline to their safety harness while ascending or descending the ladders.

E. Retractable lifeline reels shall be secured above the highest point of access to applicable ladders and be equipped with a tag line of ¼ inch synthetic fiber rope extending from the lifeline reel to the ground when the reel is fully retracted.

F. Portable ladders (e.g., extension ladders, step ladders, etc.) do not require the retracting lifeline when they are used for access to an elevation to perform a single task. When using these types of ladders in this way, the following must be complied with:

1. Personnel using the ladders must receive specific training concerning the use of portable ladders and associated fall protection techniques.

2. Personnel climbing ladders which are not tied off at the top must have another person hold the ladder at the bottom until it can be secured. This includes the last trip down after untying a ladder at the top.

3. Upon climbing to the elevation where the task is to be performed, the person on the ladder shall properly secure their safety lanyard before doing anything else. Next, the ladder must be tied off before work can begin. When the task is complete, the process is reversed with the safety lanyard being the last protective device released prior to descent.

4. Absolutely no objects, tools, or material are to be carried in hands while climbing or descending ladders.

IX. TEMPORARY WORK PLATFORMS (SCAFFOLDS AND PENCIL BOARDS)

A. All temporary platforms/walkways shall be equipped with solid decks free of openings and standard guardrail systems.

B. Personnel working from temporary platforms or traveling on temporary catwalks shall have their safety lanyard secured at all times to a lifeline or structure capable of supporting 5,400 pounds impact loading.

C. Every temporary work platform or walkway 12 feet or greater in height must be provided with a safe means of access/egress which allows personnel to remain tied off at all ties. Retractable lifelines shall be used to achieve fall protection while ascending or descending access ladders to temporary work platforms or walkways.

X. PERSONNEL LIFTS/HOISTING DEVICES

A. Aerial Lifts (scissor/manlifts, spyders and ski-climbers).

1. Personnel riding in or working from scissor/manlifts must secure their safety lanyard to the lift basket at all times.

2. Scissor/manlifts shall be placed on solid level surfaces so as to eliminate possibility of overturning.

3. Personnel riding in or working from spyders and ski-climbers shall each be provided an independent lifeline and rope grab to which their lanyard shall be secured at all times when aloft.

B. Crane Hoisted Personnel Baskets

1. Use of these devices shall comply with the safety procedures set forth in the Project Procedures Manual.

2. Personnel riding in or working from personnel baskets must have their lanyard secured to the safety cable at all times when aloft.

C. Elevators

Personnel riding inside enclosed elevator cars are not required to secure their safety lanyard.

XI. SKELETAL STEEL/OPEN STRUCTURES

This section deals with fall protection when personnel are required to gain access to travel and work in skeletal steel/open structures such as pipe racks. This includes traveling on or working on any elevated surface which is not designed as a personnel work surface or walkway (e.g., pipe, cable tray, etc.).

A. Personnel working or traveling in elevated skeletal steel/open structures shall secure their lanyards to a lifeline or structure capable of supporting 5,400 pounds at all times (100 percent Fall Protection). NOTE: THIS INCLUDES BOTH HORIZONTAL AND VERTICAL TRAVEL.

B. Personnel working or traveling in skeletal steel/open structures shall have two safety lanyards at all times in order to achieve 100 percent Fall Protection. One of the lanyards must be secured at all times.

C. Adequate lifeline systems will be provided in skeletal steel/open structures to allow 100 percent Fall Protection for personnel working or traveling in these structures.

D. Vertical travel in these structures shall consist of properly placed and secured access ladders equipped with retractable lifelines. Personnel climbing or descending these ladders shall secure these retractable lifelines to their safety harnesses while using the ladder.

E. In lieu of lifelines, personnel may secure safety lanyards to substantial structural steel members, pipe and pipe supports. Personnel shall avoid securing lanyards to cable tray, conduit and small bore screw pipe.

XII. PERMANENT STRUCTURES/STAIRS/CAGED LADDERS

A. All GCI and subcontractor personnel are required to wear an approved full body safety harness and shock absorbing lanyard on permanent platforms that are not accessible by way of a stairway.

B. Personnel working or traveling on incomplete permanent structures where fall protection exists such as floor openings and open sided floors must be properly tied off when within 6 feet of any fall exposure.

C. Priority shall be given to installation and securing of permanent floors and walking surfaces and all guardrails and other permanent fall protection devices.

D. When required, temporary guardrails and floor covers shall be installed to eliminate fall exposures.

E. Permanent stairs, when completed, shall be used to access or egress elevated work areas.

F. Caged ladders do not require secondary fall protection as the cage is a fall protection device. Personnel climbing ladders must keep both hands free for climbing at all times.

XIII. STRUCTURAL STEEL ERECTION

A. Personnel erecting structural steel shall achieve 100 percent Fall Protection through use of safety harnesses/lanyards, retractable lifelines, connector toggles, and aerial lifts (JLG, snorkel, etc.).

B. Access to structural steel shall be obtained by use of ladders, aerial lifts or other approved personnel hoisting devices. Climbing of structural steel members such as columns and diagonal braces shall not be allowed.

C. Prior to and during horizontal lifeline placement, structural personnel shall crawl (coon) steel members with lanyards secured around said members. Retractable lifelines secured at elevations above the point of operation may be used in some applications to provide fall protection prior to availability of horizontal lifelines.

D. When lanyard lengths longer than standard are required due to large steel members, the Project Safety Department shall be contacted to approve methods for obtaining the additional length.

XIV. REINFORCEMENT STEEL/CONCRETE FORM WORK

A. Personnel working on rebar walls, piers and on concrete form walls must have fall protection 100 percent of the time they are off the ground. This fall protection can be achieved through the use of retractable lifelines, static lifeline, and rope grabs or use of double lanyards.

B. Personnel working rebar or formed walls and elevated piers generally require a work positioning lanyard (cannot be used for fall protection) and a fall protection lanyard.

C. On vertical rebar walls, the safety lanyard shall be secured at a point above the worker’s head, either to a lifeline or a horizontal section of rebar.

D. On form walls, personnel shall use patented construction form tie-off attachments or lifelines to secure their safety lanyards. These persons shall receive specific TSTI on the equipment to be used and the fall protection practices to be used.

XV. RIGGING/CRANE ASSEMBLY AND DISMANTLING

A. Crane assembly and dismantling operations pose a challenge to the 100 percent Fall Prevention Program. However, through thought and planning, maximum protection can be achieved.

B. Fall Protection shall be obtained during these operations through the use of retractable lifelines, safety harnesses and lanyards, and minimizing movement in elevated areas by using ladders and, in some cases, personnel lifts.

- Policy enforcement:

--The fall protection policy and work rules are strictly enforced. No craft or work operation is exempt from the program. Employees found in violation of the rules are removed from the project.

--Supervisors are held responsible for the actions of their employees. If a supervisor has not completed the required JHA and properly trained the affected employees, he receives the disciplinary action.

FIRE PROTECTION

I. SCOPE

GCI will furnish and maintain its fire extinguishers for use against fires. GCI Safety Department has been trained in the use of portable as well as wheel mounted fire extinguishers. Also in place is an ongoing training program for all employees in the proper use of fire extinguishers. New employees receive training on the proper use of fire extinguishers during their new employee safety orientation and periodically in the weekly safety meetings.

II. FIRE EXTINGUISHERS

At least one fire extinguisher is furnished for each building, shop, and welding machine as well as certain specific work locations. All fire extinguishers will be inspected on a monthly basis by a designated competent person and color coded accordingly. In addition to the monthly inspection, fire extinguishers will be checked periodically by the Safety Department during the course of each working day.

III. GENERAL INFORMATION

All fires must be reported to the Safety Department immediately. All discharged fire extinguishers must be returned to the Safety Department and replaced with a serviceable unit. GCI officials and local agencies will handle any large scale fires which require mobile fire fighting equipment. To report a fire, the following procedures shall be used:

A. All fires shall be reported to the GCI Safety Department.

FORKLIFT OPERATION

I. PURPOSE

This procedure outlines the minimum requirements necessary for the safe operation and use of forklifts. It is designed to protect employees from possible unsafe conditions, hazards, and work practices.

II. SCOPE

This procedure applies to all construction activities on the project which require the operation of a forklift.

III. OPERATOR RESPONSIBILITIES

A. Verify the existence of any needed permits.

B. Survey each operation and identify and evaluate potential hazards.

C. Ensure that all employees involved receive training relating to the hazards and nature of the operation.

D. Ensure that all employees involved comply with the regulations contained within this procedure.

IV. REGULATIONS

A. Only operators trained on this project shall operate forklifts. Operators will be issued a license to be carried on their person at all times.

B. Due to the variety of forklift models in service on this project, operators shall understand the operating characteristics of each forklift.

C. The personal protective equipment required for forklift operators includes seatbelts, hearing protection, and gloves.

D. A functional horn and backup alarm system are required on all forklifts.

E. The rated lifting capacity of the forklifts shall not be exceeded.

F. Personnel other than the operator shall not ride on any forklift, and personnel shall not be lifted by a forklift.

G. Forklifts shall not be operated when the load or mast is within 20 feet of any suspended overhead lines without a valid Close Proximity Permit (Refer to Work Near Overhead

Electrical Lines). All overhead lines shall be considered high voltage power lines until determined otherwise by an Electrical Supervisor.

H. Operators shall not lift or otherwise place a load above personnel.

I. Indoor operation of forklifts shall be limited to well ventilated buildings.

J. Loads shall be carried as close to the ground as possible, and yet high enough to maintain clearance over obstacles.

K. When loads are transported up or down a ramp the forks shall be pointed in the uphill direction.

L. Forklifts shall not be operated when any malfunction or accident damage, whether mechanical or electrical, compromises the safe operation of any forklift. Any malfunction or accident damage to any forklift shall be immediately reported by the operator to his/her supervisor. The forklift shall be red-tagged and removed from service until the damage or malfunction is corrected and an inspection by a competent person determines that the forklift can safely return to service.

M. The forklift control shall be operated in a smooth progressive fashion and momentarily returned to the neutral position before proceeding in the opposite direction. The controls shall be operated only from the operator's seat.

N. Forklift operators shall yield to pedestrians and observe all traffic control devices.

O. Forklifts shall not travel within 5 feet of any ditch, open hole, drop off point, or excavation.

P. Forklifts shall not travel over excessively uneven ground or construction debris such as plywood, boards, or concrete spoilage.

Q. Forklifts shall not travel over drain gratings, hole covers, or other surfaces that are not designed to support the weight of the machine. Special caution should be exercised inside operating units, since trench and pit covers in these areas could collapse under the weight of a forklift.

R. When a forklift travels into an operating unit or into any area that is congested with piping or structures, a flag-man shall direct the operation. The operator shall check the area for overhead obstructions.

S. The operator shall secure an unattended forklift by lowering the forks level to the ground, turning off the ignition, and setting the parking brake.

T. During any plant emergency, the operator shall move the forklift to the edge of the road, secure the machine, and walk to an evacuation point.

U. Any exception to the above stated regulations must be addressed to the GCI Safety Department.

HEARING PROTECTION

I. PURPOSE

The purpose of this procedure is to protect employees from hearing loss resulting from exposure to high noise levels. This hearing conservation program incorporates preventive measures that reduce exposures to high noise levels.

II. SCOPE

When employees are exposed to noise levels exceeding those in Figure A (included at the end of this section), administrative or engineering controls must be established. While these controls are being evaluated and implemented, personal protective devices must be used as an interim control.

III. ENGINEERING CONTROLS

Engineer controls are feasible when similar controls have been used elsewhere, and the exposures are being kept within permissible levels. Engineering controls are not feasible when they interfere with or change the operations to an intolerable degree, create additional safety or health hazards, or when corrections from engineering approach are not applicable. A feasibility study should be a joint effort of the Safety Department and job site engineers. All information and correspondence related to an engineering feasibility study will be kept on file at the job site.

Engineering controls include maintenance, modifying equipment, substitution of equipment, isolation, and the use of acoustic material.

IV. ADMINISTRATIVE CONTROLS

Administrative controls shall include rotation of employees, limitations on the exposure time of certain operations, and access restrictions on work areas.

V. INTERIM CORRECTIVE ACTION

If feasible engineering or administrative controls cannot be accomplished, personal protective devices must be used to reduce sound levels to the permissible noise exposures shown in Figure A. Personal protective devices are also used during non-routine, infrequent operations that do not warrant special engineering control. Signs or other means of notification can be used to inform the employee that hearing protection is required when entering an area. The type of hearing protection depends on the operation.

VI. SPECIFIC REQUIREMENTS

A. Employees will be required to wear ear plugs when operating tools or equipment which create high noise levels and while working in areas designated as high noise level areas. Designated tasks and activities where hearing protection is required are:

1. Cherry Picker, Operator and Passenger.

2. Front End Loader Operator.

3. Backhoe Operator.

4. Dozer Operator.

5. Compactor Operator.

6. Bobcat Operator.

7. Sand Tamper and Jumping Jack Operator.

8. Grinder Use.

9. Arch Gauging.

10. Chipping Gun Use.

11. Powder Activated Gun Use.

12. Jack Hammer Use.

13. Impacting Bolts.

14. Blowdown Operations.

15. Sandblasting.

16. Skill Saw Use.

17. Table/Radial Arm Saw Use.

B. Designated high noise level areas where hearing protection will be required are:

1. Structural Iron Fabrication Shop.

2. Pipe Fabrication Shop.

3. All Operating Units.

4. Other Posted Areas Next to Operating Equipment.

VII. TRAINING

New employees will be trained in the proper use and care of ear plugs prior to being released to their respective work areas. Ear plugs will be made available at all job site toolrooms. The need for any additional types of hearing protection equipment will be determined by the GCI Safety Department.

VIII. ADDITIONAL REQUIREMENTS

The use of hearing protection is not limited to the areas and tasks mentioned in this procedure. The GCI Safety Department may designate any area as a "High Noise Area" and require the use of hearing protection in that area.

FIGURE A

Permissible Noise Exposures

Duration Per Day (Hours)	Sound Level (dBA)
12	86.8
10	88.4
8	90
6	92
4	95
3	97
2	100
1-1/2	100
1	112
½	110
¼ or less	115

TOOL AND EQUIPMENT INSPECTIONS

I. PURPOSE

This procedure provides a system that ensures the regular inspection of the listed tools and equipment used on the project.

II. SCOPE

This procedure outlines what, when and how tools and equipment are to be inspected on this project. Although it ensures periodic inspections of the items, it in no way relieves the individual user from checking tools and equipment prior to use.

III. DAILY VISUAL INSPECTIONS (NO WRITTEN RECORDS REQUIRED)

The following items must be inspected daily by the user or users prior to use. No written inspection records will be required.

A. Vehicles and equipment.

B. Rigging equipment.

C. Electrical cords, electrical tools and hand tools.

D. Safety harnesses, lanyards, retractable lifeline reels and lifelines.

E. Ladders.

F. Fire extinguishers.

IV. DAILY INSPECTION (WRITTEN RECORDS REQUIRED)

Scaffolds must be inspected daily by the responsible craft supervisor. The supervisor will fill out a scaffold inspection tag and attach it to the scaffold. For further detail, review the job site scaffold procedure.

V. WEEKLY INSPECTION (WRITTEN RECORDS REQUIRED)

Lifelines will be inspected weekly by a designated qualified person. Weekly written records are required and must be turned in weekly to the Safety Office.

VI. MONTHLY INSPECTIONS (WRITTEN RECORDS REQUIRED)

The following inspections must be performed on a monthly basis. Inspections will be conducted by a designated, qualified person. Records must be turned into the Safety Office by the 10th of each month.

A. Backhoes.

B. Come-a-longs and chainfalls.

C. Drum hoists (air tuggers).

D. Forklifts.

E. Hydraulic cranes (cherry pickers, Drotts).

F. Lifting cranes.

G. Overhead cranes.

H. Personnel lifts (JLG, manlifts, scissor).

I. Spyders and ski-climbers.

VII. MONTHLY INSPECTIONS (WRITTEN RECORDS AND COLOR CODING REQUIRED)

A. Chokers and slings.

B. Safety harnesses and lanyards.

C. Electrical tools and cords.

D. Retractable lifeline reels.

E. Fire extinguishers.

F. Portable ladders.

VIII. QUARTERLY INSPECTION (WRITTEN RECORDS REQUIRED)

Permanently wired circuits and office equipment will be inspected and color coded on a quarterly basis (January, April, July, October) by a designated competent person.

MANLIFT OPERATION

I. PURPOSE

This procedure outlines the minimum requirements necessary for the safe operation and use of manlifts. It is designed to protect employees from possible unsafe conditions, hazards, and work practices.

II. SCOPE

This procedure applies to all construction activities on the project which require the operation of a manlift.

III. OPERATOR RESPONSIBILITIES

A. Verify the existence of any needed permits.

B. Survey each operation, and identify and evaluate potential hazards.

C. Ensure that all employees involved receive TSTI-II relating to the hazards and nature of the operation.

D. Ensure that all employees involved comply with the regulations contained within this procedure.

IV. REGULATIONS

A. Only operators trained on this project shall operate manlifts. Operators will be issued a license to be carried on their person at all times.

B. Each manlift shall have inside and outside handrails. Manlifts that do not meet this requirement shall be red-tagged and removed from service until the problem is corrected.

C. 100 percent tie-off is required at all times while anyone is in the basket. Personnel shall tie off only to the inside handrails or to the D-rings located under the control panel. Personnel shall not tie off to a structure, landing, or similar ridged support while working from inside the basket.

D. The rated weight capacity of the basket shall not be exceeded. Remember that the total weight is the combined weight of the personnel, tools, and materials. Material that extends beyond the perimeter of the basket shall not be placed in the basket.

E. Manlifts shall not be operated within 20 feet of any suspended overhead lines. All overhead lines shall be considered high voltage power lines until determined otherwise by an Electrical Supervisor.

F. Manlifts shall not be operated in wind conditions that exceed the maximum allowable wind speed established in the operations manual.

G. Manlifts shall not be operated when any malfunction or accident damage, whether mechanical or electrical, compromises the safe operation of any manlift. Any malfunction or accident damage to any manlift shall be immediately reported by the operator to his/her supervisor. The manlift shall be red-tagged and removed from service until the damage or malfunction is corrected and an inspection by a competent person determines that the manlift can safely return to service.

H. The basket of the manlift shall remain clean and free of unnecessary debris, trash, or materials. Bolts, fittings, and other small items shall not be placed on the control panel.

I. Employees shall enter and exit the basket only when it is lowered to ground level. Any exceptions to this rule must be approved by GCI Safety Department.

J. All employees working inside the basket shall keep both feet placed firmly on the floor. Standing or working from the mid-rail or top-rail of the basket is not allowed.

K. Ladders shall not be used inside the basket to access upper elevations and boards shall not be placed across the mid-rails or top-rail for use as a work platform.

L. The manlift controls shall be operated in a smooth progressive fashion and momentarily returned to the neutral position before proceeding in the opposite direction. The foot pedal switch shall be activated only by the operator handling the manlift controls.

M. Manlifts shall travel only when the base of the basket is within 6 feet of the ground and the boom is fully retracted.

N. Manlifts shall not travel within 5 feet of any ditch, open hole, drop off point, or excavation.

O. Manlifts shall not travel over excessively uneven ground or construction debris such as plywood, boards, or concrete spoilage.

P. Manlifts shall not travel over drain gratings, hole covers, or other surfaces that are not designed to support the weight of the machine. Special caution should be exercised inside operating units, since trench and pit covers in these areas could collapse under the weight of a manlift.

Q. When manlifts travel into an operating unit, on any street, or into any area that is congested with piping or structures, a flag-man shall direct the operation.

R. If the manlift becomes stuck or otherwise will not travel, the boom shall not be extended to contact the ground or a solid structure in an effort to push the manlift.

S. Manlifts shall be set up to operate on solid level surfaces, such as concrete, asphalt, or compacted soil. Operating on soft mud or loose sand is prohibited.

T. Wen working overhead, a red barricade and “Danger Men Working Overhead” signs must be posted. The barricade shall prevent access to the area adjacent to the counterweight, and the area underneath the elevated boom and basket.

U. Any exception to the above stated regulations must be addressed to the Safety Department.

MANLIFT OPERATOR'S TEST

Name_____Employee #_____Craft_____Date_____

1._____is required at all times while anyone is in the basket.

2. Personnel shall tie-off only to the _____located under the control panel.

3. Personnel shall not tie off to a _____, _____, or similar while working from inside the basket.

4. The rated _____ of the basket shall not be exceeded. Remember that the total weight is the combined weight of the _____, _____, and _____. Material that extends beyond the _____of the basket shall not be placed in the basket.

5. Manlifts shall not be operated within ____ feet of any suspended overhead lines. All overhead lines shall be considered high voltage power lines until determined otherwise by an _____ ,

6. Manlifts shall not be operated in wind conditions that exceed the maximum allowable wind speed established in the _____ _____.

7. The _____of the manlift shall remain clean and free of unnecessary debris, trash, or materials. Bolts, fittings, and other small items shall not be placed on the _____.

8. Employees shall enter and exit the basket only when it is lowered to _____ level.

9. All employees working inside the basket shall keep ____ _____ placed firmly on the floor. _____ or _____ from the mid-rail or top-rail of the basket is not allowed.

10. _____ shall not be used inside the basket to access upper elevations and boards shall not be placed across the mid-rails or top rail for use as a work platform.

11. Manlifts shall not travel within _____ feet of any ditch, open hole, drop off point, or excavation.

12. Manlifts shall not _____ _____ excessively uneven ground or construction debris such as plywood, boards, or concrete spoilage.

13. Manlifts shall not travel over _____, _____, or _____that are not designed to support the weight of the machine.

14. When manlifts travel into an operating unit, on any street, or into any area that is congested with piping or structures, a _____shall direct the operation.

15. If the manlift becomes_____or otherwise will not _____, the boom shall not be extended to contact the ground or a solid structure in an effort to push the manlift.

MATERIAL HANDLING

I. PURPOSE

The handling, setting and erection of materials and equipment is a hazardous occupation. Each operation presents its own set of problems and no two jobs are alike. This procedure provides guidelines so that each job can be performed free of near misses, bodily harm to employees, and without damage to equipment.

II. SCOPE

This procedure applies to all material handling operations performed by personnel (both GCI and subcontractor) on the project.

III. JOBSITE PREPARATION

Prior to the beginning of work in a new area, supervisors and employees should complete a pre-job planning work area survey to assure that the employees in the area will be provided a safe work environment. Items that should be addressed are:

A. Designate areas for fabrication and layout work.

B. Identify the area that will be used for material storage.

C. Remove any trip fall hazards and scrap materials. Fill any holes encountered. Consider the use of dirt equipment or the placement of rock in the work area.

D. Have in place prior to the placement of material into the storage area:

1. Dunnage needed for the stacking and storage of pipe, structural iron, forms, lumber, etc. All pipe storage must be placed on pipe or "H" beam that has welded standards in place to prevent the material from rolling.

2. Walkways in and around the material storage area.

E. Remove all trip and fall hazards and scrap materials. Fill all holes. Consider the use of dirt equipment to prepare the area.

F. Assure drainage of area water.

G. Place 55 gallon trash containers in the work area.

H. Have skip pans in place for storage and placement of scrap materials. Have these skip pans positioned in a location which will enable them to be removed from the area when they become full.

IV. AREA MAINTENANCE

After the job begins, maintain housekeeping in and around the work and storage areas.

A. Maintain a clear access way from the roadway to the laydown areas as well as from the work area to the laydown area.

B. Remove all unused dunnage from the area as it becomes available.

C. Only material that is needed for the job should be placed in the work area.

V. PREJOB PLANNING

Ask the following questions when handling material.

A. Can the job be planned so that mechanical handling is safer and more efficient?

B. How does the material being handled injure the workers doing the handling?

C. Can workers be given handling aids that will make their jobs safer?

D. Is there a safer way?

E. Can you identify potential hazards associated with each assignment?

F. Are there safer measures that may be taken to minimize those hazards?

VI. MANUAL LIFTING

All injuries that are attributed to material handling can be corrected. The following guidelines are designed to establish procedures to eliminate injuries while handling materials.

A. One of the most common and most devastating of injuries is the back injury. The back was not designed to lift. The back is only designed to hold and support the upper body. All back injuries can be eliminated with the use of proper lifting techniques and proper body mechanics.

B. Manual lifting must be avoided when possible. Mechanical means are available to the supervisor and the employee. These means vary with the job application. Grasshoppers and Roustabouts are available to move small heavy loads when needed. The use of picker, Drotts and cranes are everyday means of moving materials and are readily available.

C. Manual lifting is used only as the last resort and done when all other means have been explored and resources exhausted. Weight limits for manual lifting are as follows:

1. One person lift – 50 pounds.

2. Two person lift – 100 pounds.

3. Maximum number of people making a manual lift – two.

D. Any manual lifting needs that exceed the guidelines must be approved by the Craft Superintendent and a Manual Lifting Checklist completed.

E. When it has been determined that a manual lift is the only way possible to move the material, the employee must follow these steps prior to moving the materials.

1. The material to be moved must be moved twice. Once in the employee's mind and once while moving the material. This is done by completing a job area survey that must be completed by the employee to assure that there is an absence of unsafe conditions that could contribute to an injury while moving the material. The employee must confirm that the walkway or route traveled by the employee is open and accessible from the material storage area as well as the area where the material is to be relocated. For example, should there be evidence of pinch points, trip, fall, or slip hazards, the material should be moved only after these hazards have been eliminated.

2. Next, ensure that the material to be moved can be safely carried by the employee. The material should be of such size that the employee can safely hold or carry the material. One of the most common causes of injury is the lifting of materials that are too heavy for the person's strength and physical condition.

3. Do not hesitate to ask for help if the object to be moved is too large or too heavy. If you do not feel well enough on a certain day to lift even the loads listed above, do not move the material without help. Large, bulky items that may not necessarily be heavy can be difficult to keep close to the body. Small heavy objects that are within established lifting guidelines may not be safely moved as the size of the object can prohibit the carrying of the material by two people.

4. When physical lifting, be sure to apply proper lifting techniques whether working alone or as a team. When lifting, follow these steps:

   a. Get close to the load and grasp it firmly.

   b. Set your stomach muscles as if you were doing a pelvic tilt. This helps to prepare them to support your spine so it can support the load.

c. Keep your back upright as you use your strong leg muscles to lift the load. Avoid twisting; it can cause injury.

d. Unload carefully: Release the load as safely as you lifted it. Plan where you can put down the load. Pick your spot carefully so no one has to move the load again.

5. When team lifting, pick one person to call the signals. The leader should direct the team so you all lift together, walk in step, and lower the load together, using the lifting principles above.

VII. GLOVES AND HAND PROTECTION

Gloves are to be worn at all times while working on this project. When handling materials wear the necessary hand protection that is appropriate for the job you are doing. Leather, cotton and rubber gloves are available at the toolroom on payroll deduction.

A. Gloves are a requirement of employment and are to be considered a required part of your personal equipment.

B. Leather gloves are to be worn whenever handling materials which present the presence of chip or burr hazards, pinch points, or when the surfaces of the materials are abrasive or can be destructive to the cotton or rubber gloves.

C. Cotton gloves should be limited to jobs which are of a type which do not compromise hand safety when exposed to hazards associated with material handling injuries.

D. Rubber gloves with gripping lugs can be used when water, mud or chemicals present a hazard to the employees hands.

E. The exception to the aforementioned glove and hand protection policy is when the use of gloves compromise the safety and welfare of the employee. The exceptions to the policy are as follows:

1. Operation of power drills that have a drill chuck greater than 3/8 inch and all drill presses.

2. Operation of power ponies and pipe threading machines.

3. Operation of circular power saws.

4. Operation of bench grinders.

VIII. TRANSPORTATION, LAYDOWN, AND MATERIAL STORAGE

A. Transportation

1. Material transportation should be accomplished by mechanical means whenever possible. The use of pickers, trailers, and forklifts are required when moving materials into a new or established work area. The movement of materials by personnel should be limited to short moves that are within the established manual lifting weight guidelines.

2. All mechanical equipment must be operated by qualified persons. The load and unloading of material shall be under the supervision of supervisors who are familiar with the equipment being used to load and unload the material as well as the proper method to load and secure the material after loading.

3. When loading or unloading a float trailer, the standards must remain in place. The driver of the vehicle must leave the vehicle when work is in progress and the keys must be removed. Loading and unloading is accomplished from the back of the trailer to the front.

4. When unloading, all loads to be hoisted must be double wrapped. Rigging on the load shall be done by a trained rigger. When transporting a load by mechanical means, a tagline must be attached to that load at all times. The tagline is only to be removed after the load has been secured.

B. Laydown/Storage

1. Materials are to be placed in approved storage areas only.

2. Materials must be placed in order by their need and should be arranged so that there is an established access or walkway in and around the material.

3. Walkways must be kept clear at all times and must be wide enough to allow access to the material by mobile equipment and personnel. Space shall be left for employees to walk between pallets etc., for reason of inventory or retrieval of those materials placed in these areas.

4. All materials which are to be removed and transported by hand should be stored at waist level to avoid lifting from the ground.

5. Pipe, structural iron, and other materials should be placed on dunnage and secured with chocks. Pipe shall be placed on racks or dunnage that are equipped with end standards that are welded in place.

6. Large pipe or duct which must be pig penned cannot be of a height that exceeds eighteen inches unless there has been prior approval by the Project Manager.

IX. SAFE RIGGING PRACTICES

A. Know the weight of the load before lifting it.

B. Use taglines on all hoisted loads.

C. Rig the load so that the load is directly below the crane block.

D. Never exceed the safe working capacity of any piece of rigging equipment.

E. Only experienced Qualified Operators are allowed to operate lifting equiment.

F. Keep slings or chokers from harmful environments such as close proximity to flame cutting, arc welding, or gouging and corrosives. Also, contact with solvents and chemicals must be avoided. After use, slings should not be left lying on the ground, but stored in a dry protected area.

G. Avoid binding the eye of a sling around a corner at any time. Use softeners when bending the body of the sling around sharp corners to prevent mechanical damage.

H. Make sure the sling is not caught between the load and block when landing the load.

I. Keep hands out of pinch points.

J. Go slowly whenever lifting or moving a load.

K. Do rigging work only when visibility is good.

L. Allow only qualified riggers to direct the work.

M. Stop operation if contact between the operator and flagman is lost.

N. Job or shop made fasteners, hooks or links formed from bolts, rods, etc. or other attachments shall not be used.

X. SLINGS (WIRE ROPE)

A. Wire rope shall not be secured by knots.

B. Wire rope clips shall not be used to form eyes on wire rope slings.

C. Wire rope slings need to be kept from harmful environments.

XI. SLINGS (SYNTHETIC WEBBING)

A. Each synthetic woven sling shall identify the name or trademark of manufacture, capacity ratings, and type of sling material.

B. Rated capacities shall not be exceeded.

C. Slings shall be padded or protected from sharp edges of the loads they hoist.

D. Nylon slings shall not be exposed to acids.

E. Polyester or polypropylene slings shall not be exposed to acids.

POWDER ACTUATED TOOLS

I. PURPOSE

Regardless of the make, type or size, all explosive tools can be hazardous. However, they can be used safely and to an advantage provided certain precautions are followed during their use.

II. SCOPE

The following regulations govern the use and storage of all such tools under the control of the project.

III. STORAGE AND MAINTENANCE

A. The explosive powder-actuated tool and ammunition must be kept in a locked box at all times (other than when being used) to prevent unauthorized use.

B. Storage of the tool, ammunition, and studs shall be controlled to the point that only AUTHORIZED, TRAINED personnel can withdraw them for use. Operators will be required to show a license to the toolroom attendant before a tool can be issued. Ammunition shall be kept under lock and key at all times when not in use.

C. Manufacturer's recommendations shall be followed as to inspection, maintenance, replacement parts, and ammunition.

IV. USE

A. The utmost care must be exercised to ensure that ammunition studs, nails, etc., are of the proper specification. The tool operator is to be instructed and must be positive that the tool is at all times equipped with the proper ricochet or spall guard. A designated person from the manufacturer shall train, qualify, and license site employees in use and maintenance of the gun.

B. Only "card carrying" authorized individuals are allowed to use powder-actuated tools.

C. The area shall be barricaded with red tape and a sign stating "Danger – Powder-Actuated Tool in Use" must be posted.

D. The tools shall not be used where the stud is to be driven into surface-hardened steel, cast iron, glazed brick or tile, marble, granite, live rock, or similar brittle materials.

E. Tools must not be used in any location where explosives, flammable gases, vapors, or dusts are present.

F. Operation of the tool will require a valid GCI Hot Work Permit and Gas Test Report.

G. The tool operator and any nearby workers must wear face shield or monogoggles over safety glasses.

H. The tool operator and nearby workers will be required to wear ear plugs.

I. Operator must assure no one is on the back side of material being shot to avoid injury by penetration.

J. The tool shall not be loaded until just prior to the intended firing time. Tools shall never be pointed at anyone.

K. Loaded tools shall not be left unattended.

L. Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side. If the fastener must be driven closer than 3 inches to the edge of brick, concrete masonry surfaces, steel safety shields shall be placed on the sides of the surfaces to prevent flying spalls. No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

M. Only the "captive stud" type gun shall be used. Guns capable of firing a stud into free flight at high velocity are prohibited.

V. MISFIRE

In case of a misfire, the operator shall hold the tool in the operating position for at least 30 seconds, then proceed to fire the next shot. Misfired charges should be turned in with the tool and subsequently turned over to the site Safety Office for disposal.

RESPIRATORY PROTECTION

I. PURPOSE

This procedure establishes a system that ensures the respiratory protection of all employees in accordance to CFR 1910.134.

II. SCOPE

Respirators must be worn by employees who are working in contaminated areas.

If, at any time, employees are working in the area, contaminant levels above the "Action Level" or "PEL" are detected, this area will be designated as a "Regulated Area" and this procedure will be implemented.

Employees must use the NIOSH/MESA certified respiratory protection provided in accordance with project instruction and training. Training will be conducted by GCI Safety Department.

An employee must not be assigned to a task requiring the use of a respirator unless it has been determined that he/she is physically able to perform the work while using the equipment.

The procedures in this program are not a substitute for generally accepted engineering control measures against air contaminants.

III. APPROVED RESPIRATORS

A. To ensure the maximum amount of respiratory protection, a NIOSH/MESA certified respiratory approved specifically for the hazard must be used.

B. Approved respirators must be used only for the purpose for which they were originally intended and must not be modified in any way.

IV. RESPIRATOR SELECTION

A. The following factors are considered in selecting a respirator:

1. Nature of the hazard.

2. Extent of the hazard.

3. Contaminant(s) present.

4. Warning properties.

5. Concentration of the contaminant(s).

6. Characteristics and limitations of the available respirators.

7. Expected activity of the worker.

B. A self-contained breathing apparatus rated for at least 30 minutes service time is used for entry into an irrespirable atmosphere. This apparatus must have a "remaining service life" indicator or warning for compressed breathing air (except when used for self-rescue).

C. A combination self-contained breathing apparatus and air line respirator must have either a manual or automatic valve to switch to the self-contained air supply if the air line supply fails. A self-contained breathing apparatus rated for 15 minutes service time must be used only for emergency egress and not for rescue work or re-entry.

D. All employees in the area where the contaminant levels are expected to be higher than the level designated for an air purifying respiratory must use an air line respirator.

E. The types of respiratory equipment available on the project are:

1. MSA & Wilson Paper Filter Masks.

2. 3M half mask respirators available in small, medium and large sizes.

V. EMPLOYEE QUALIFICATIONS

A. Prior to use of any respirator on this project, a medical questionnaire will be required.

B. In addition to the medical requirements above, no employee will use a respirator until he has been properly trained in the correct fit and use of the equipment.

VI. USE AND LIMITATIONS

A. An air purifying respiratory cannot be used for rescue work or for emergency work of any nature because an air purifying respirator does not supply oxygen and, therefore, does not protect against possible oxygen deficiencies.

B. The proper type of canister, cartridge, or filter must be specifically selected for the atmosphere and conditions to be encountered. For gases and vapors, the maximum concentration for which the air purifying element is designed is specified by the manufacturer or is listed on labels of cartridges and canisters.

C. An effective seal must be obtained between the face piece and face to prevent inward leakage. An air purifying respirator along with a demand-type respirator operates under negative pressure when the wearer inhales, thus some inward leakage of a contaminant is possible.

D. If the temple bars of eyeglasses extend through the sealing edge of a full-face mask, a proper seal cannot be obtained. Eyeglasses with short temple bars or without temple bars may be taped to the wearer's head. Full-face masks have been developed with systems for mounting corrective lenses inside the face piece.

E. The wearer's eyeglasses or goggles should not interfere with a half-mask face piece.

F. A heavy beard or sideburns may interfere with obtaining a proper seal. Restrictions on facial hair are established for tasks requiring a respirator.

VII. PRECAUTIONS

A. The following safety precautions are taken when using a respirator:

1. In noisy areas, establish an alternate form of communication between workers. Speech transmission over short distances in relatively quiet areas is usually satisfactory.

2. To prevent a face piece from fogging up in low temperatures, use an anti-fog compound to coat the inside of the face piece.

3. Do not use pure oxygen in a supplied air respirator.

4. Do not work in or near the flammable range of a gas or vapor.

5. Select an air supply hose that resists chemicals to which it may be exposed.

B. Supervisory Responsibilities:

1. Identify employees who may need respiratory protection.

2. Enforce the use of personal protective equipment, where required.

3. Remain aware of factors in the work area that could increase the degree of employee exposure to stress related respirator use, such as prolonged exposures times, high levels of contaminants, or introduction of new materials and changes in weather.

C. Employees should be knowledgeable of:

1. The nature of the hazard and what might happen if a selected respirator is not worn.

2. The limitations of their respiratory equipment.

3. How to use the respirator assigned to them.

4. How to recognize an emergency and to use the proper equipment.

VIII. RESPIRATOR MAINTENANCE

A. Respiratory equipment will be stored and maintained in the Safety Department. Equipment will be checked out daily and must be returned by the end of each shift. Maintenance of respirators will be performed by a designated competent person within the Safety Department.

B. The responsibilities for respiratory equipment inspection is as follows:

1. Respirator Room Technician:

a. Respirators shall be inspected before and after each issue for use.

2. Equipment User:

a. Respirators shall be inspected before and after each use.

b. Awareness of the function and fit of the equipment shall be maintained while it is in use.

C. The responsibilities for respiratory equipment maintenance is as follows:

1. Respirator Room Technician:

a. Only replacement parts specifically made for the respirators shall be used for repair purposes.

b. Respirators shall be issued to employees on a daily basis for their exclusive use. Respirators will be cleaned and disinfected prior to reissue to or use by another person.

c. Cleaning and disinfecting shall be performed by a designated competent person. Respirators will be immersed and scrubbed in a solution of warm water and Cleaner-Sanitizer. They will then be rinsed in clean water and allowed to air dry.

2. Equipment User:

a. Air purifying cartridges shall be replaced immediately at the first trace of odor or an increased resistance in breathing. All cartridges shall be routinely replaced at the end of each shift.

b. The Project Manager shall be immediately notified of any difficulties with their equipment.

c. Equipment shall be properly stored and maintained while in the field.

D. Storage:

1. Respirators will be stored in the respiratory room.

2. After respirators have been cleaned and air-dried, they will be stored in a protective plastic bag.

IX. TRAINING

A. Each employee required to wear a respirator will be trained in its selection, use, and maintenance.

B. Each employee wearing a respirator will receive fitting instructions, including a demonstration and practice in how the respirator is worn.

C. Fit testing will be conducted by a designated competent person. Employees wearing air purifying respirators will receive the following fit tests.

1. Positive pressure.

2. Negative pressure.

3. Qualitative using saccharin solution or irritant smoke.

D. Upon completion of the training class, employees will be issued a Respirator Fit Test/Training Card. The type and size of respirator the employee is trained to use will be listed on the card. The respirator certification is valid for a period of one year from the date of fit test.

X. AIR QUALITY

A. Air Supplied Respirators

1. The air supply must be free of harmful quantities of contaminants. Table 1 shows the acceptable content analysis of breathing air.

2. Pure oxygen must never be used with an air line respirator.

3. Breathing air can be supplied to a respirator from a cylinder or an air compressor.

4. The compressor that is supplying the air must be equipped with necessary safety and standby devices. A breathing air type compressor must be used. Compressors must

be constructed and situated to avoid entry of contaminated air into the system. An extension of the exhaust pipe aids in preventing the recycling of exhaust fumes by the compressor. An alarm must also be installed to indicate compressor failure or overheating. If an oil lubricated compressor is used, it must have a high temperature or carbon monoxide alarm or both to ensure that the air supply meets the specifications in the table at the end of this section. If only a high temperature alarm is used, the air from the compressor must be tested frequently for carbon monoxide.

5. Plant air cannot be used for breathing air or for ventilation of confined spaces.

6. Suitable in-line, air purifying, sorbent beds and filters must be installed in the compressor system. Maintenance of these purifying filters is essential and is documented on the Compressed Air Purifying filter Maintenance sheet.

B. Air Receivers.

All newly installed air receivers must be constructed in accordance with the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code.

C. Installation.

Air receivers must be installed so that all drains and hand-holes are easily accessible. Air receivers should be supported with sufficient clearance to permit a complete external inspection and to avoid corrosion of external surfaces. Under no circumstances is an air receiver to be buried underground or located in an inaccessible place. The receiver should be located as close to the compressor of after cooler as is possible in order to keep the discharge pipe short.

D. Drains and traps.

A drain pipe and valve must be installed at the lowest point of each air receiver to remove accumulated oil and water. Adequate automatic traps can be installed in addition to drain valves. The drain valve on the air receiver can be completely drained to prevent the accumulation of excessive amount of liquid in the receiver.

E. Gauges and Valves.

1. Each air receiver must be equipped with a readily visible indicating pressure gauge and with one or more spring-loaded safety valves. The total relieving capacity of the safety valves must prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by no more than 10 percent.

2. No valves of any type can be placed between the air receiver and its safety valves.

3. Safety appliances such as safety valves, indicating devices, and controlling devices must be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

4. All safety valves must be tested frequently and at regular intervals to determine whether they are in good operating condition.

5. A pressure-reducing diaphragm or valve must be installed to reduce air pressure to the requirements of the particular respirator being used.

XI. ABRASIVE BLASTING

A. An approved, properly fitted, air line respirator with a hood, apron, and dust collar must be worn by an employee performing sandblasting operations when:

1. Working inside blast cleaning rooms.

2. Using silica in manual blasting operations in which the nozzle and blast are not physically separated from the operator in an exhaust ventilated enclosure.

3. Concentrations of toxic dust dispensed by the abrasive blasting may exceed the limits established by the American Conference of Governmental Industrial Hygienists and the nozzle and blast are not physically separated from the operator in an exhaust ventilated enclosure.

B. In addition to the hood, an employee performing sandblasting should wear an approved particulate-filter respirator when working in high dust concentrations. This respirator provides the protection when sandblasting has ceased and the hood has been removed.

C. An approved particulate-filter respirator must be worn by all employees in the abrasive blasting area. Short, intermittent, or occasional dust exposure such as during clean up, dumping of dust collectors, or unloading shipments of sand at the receiving point require the use of a particulate-filter respirator.

XII. WELDING

A. Welding, cutting, and heating in the open air or on metals of no toxic significance can normally be performed without mechanical, ventilation or respiratory protective equipment. When an unsafe accumulation of contaminants exists because of unusual physical or atmospheric conditions, suitable mechanical ventilation or respiratory protective equipment must be used:

B. Confined Spaces.

1. General, mechanical, or local exhaust ventilation must be provided when welding, cutting, or heating in a confined space.

2. When sufficient ventilation cannot be obtained without blocking the means of access, an employee in a confined space must be protected by an air line respirator. An employee outside the confined space is assigned to maintain communication with those working within it and to aid them in an emergency.

XIII. METALS OF TOXIC SIGNIFICANCE

A. Welding, cutting, or heating involving the following metals must be performed with either general, mechanical, or local exhaust ventilation:

1. Lead base metals.

2. Cadmium-bearing filler materials.

3. Chromium-bearing metals or metals coated with chromium-bearing materials.

B. Welding, cutting, or heating in an enclosed space involving the following metals must be performed with local exhaust ventilation, or the employees must be protected by air line respirators:

1. Metals containing lead (other than as an impurity) or metals coated with lead-bearing materials.

2. Cadmium-bearing or coated base metals.

3. Metals coated with mercury-bearing metals.

4. Beryllium-containing base or filler metals. Because of its high toxicity, work involving beryllium must be done with both local exhaust ventilation and an air line respirator.

C. An employee doing welding, cutting, or heating of metals of toxic significance in the open air must be protected by an approved filter-type respirator.

D. An employee doing welding, cutting, or heating of a beryllium metal in the open air must use an air line respirator.

E. Other employees exposed to the same atmosphere as the welders or burners must be protected in the same manner as the welder or burner.

XIV. INERT-GAS, METAL ARC WELDING

A. Inert-gas, metal arc welding processes involve the production of ultraviolet radiation of intensities from 5 to 30 times that produced during shielded, metal arc welding. These ultraviolet rays decompose chlorinated solvents and liberate toxic fumes and gases. The use of chlorinated solvents must be kept at least 200 feet (unless shielded) from the exposed area, and surfaces prepared with chlorinated solvents must be thoroughly dry before welding is permitted on such surfaces.

B. When inert-gas, metal arc welding is being performed on stainless steel, an enclosed space must have local exhaust ventilation, or the employee must be protected by an air line respirator to protect against dangerous concentrations of nitrogen dioxide.

XV. PRESERVATIVE COATINGS

A. In enclosed spaces, all surfaces covered with toxic preservatives must be stripped of the toxic coatings for a distance of at least four inches from the area of heat application, or the employee must be protected by an air line respirator.

B. In the open air, an employee must be protected by an approved respirator.

XVI. SPRAY PAINTING

A. When hazardous substances used in spray coating are in a combination of particulate matter and gases or vapors, the respirator must contain both a mechanical filter and an absorbent filter.

B. When spraying is done in spray painting booths, in open shops, or in the open air, nondrying oil or grease may be used by the employees for anointing exposed parts of the body during spraying operations.

XVII. CARBON MONOXIDE MONITORING OF BREATHING AIR

When compressed air is used for breathing, it must meet stringent air purity requirements. This means a 20 parts per million (ppm) limit of carbon monoxide concentration. Most common filters used in the field cannot filter out carbon monoxide. Therefore, monitoring for carbon monoxide is a must when supplying breathing air from oil lubricated air compressors.

A. In-Line Continuous Monitoring

Carbon Monoxide Monitors – The carbon monoxide monitor supplies a constant check for air contamination from compressor overheating or intake air. This monitor has an alarm, which allows the employee to shut off the compressor and remove the source of contamination.

B. Intermittent Monitoring

1. Detector Tubes for Carbon Monoxide.

a. The detector tube method of monitoring must be performed on a routine basis and documented on the Carbon Monoxide Monitoring of Breathing Air form.

2. Direct Reading Carbon Monoxide Meters.

a. The meter reading system provides accurate data and ease of monitoring. Carbon monoxide readings must be performed frequently and documented on the Carbon Monoxide Monitoring of Breathing Air form.

b. Intermittent monitoring is good for spot checks because it shows leakage of carbon monoxide into the air supply. The time span between monitoring could be such that carbon monoxide levels could exceed the limits and possibly cause harm to the employee.

Before using an intermittent monitoring system, precaution must be taken to ensure that air contaminants cannot enter the intake air of the compressor and that the high temperature shutoff valve is operable.

BREATHING AIR QUALITY

(COMPRESSED GAS ASSOCIATION G-7.1 SPECIFICATIONS)

GAS	CONTENT ANALYSIS
O_2	19.5 percent minimum to 23.5 percent maximum
CO	20 ppm maximum
CO_2	1,000 ppm maximum
Hydrocarbons	5mg/m^3 maximum (as condensables)
H_2O	Dew point less than the lowest temperature to be encountered
Odor	Free of all objectionable odors

SPILL RESPONSE

I. PURPOSE

This procedure provides guidelines to minimize the impact of spills to the ground, sewer systems, or any surface water.

II. SCOPE

Applies to the employee health and safety and environmental responsibilities of GCI.

III. PROCEDURE

A. The first response to a spill is to minimize the risk to human health and safety, followed by the immediate containment and retrieval of all materials.

B. Employees will notify their supervisor of any spill that is a risk to human health and/or safety, or the environment.

C. Supervisors will notify the GCI Safety Department of the spill. Safety representatives will initiate the following steps to retrieve the spilled material.

1. Notification of Project Manager, the affected Craft Superintendent and an GCI representative.

2. The spill site, including soil, shall be promptly cleaned up in accordance with the instructions of GCI.

3. A Near Miss/Accident Report shall be completed by the affected Craft Supervisor.

4. A formal incident report shall be submitted to Project Manager.

POTABLE WATER

I. PURPOSE

This procedure provides guidelines to establish a method of protection for personnel who drink and wash with potable water provided by the project.

II. SCOPE

Applies to all GCI and subcontractor employees using potable water supplied by the project.

III. PROCEDURE

A. Water Cans

1. Water cans shall be labeled “DRINKING WATER ONLY.”

2. Personnel shall only drink potable water from project supplied water cans.

3. Personnel shall not open or remove the lids of water cans for any reason.

4. Potable water in the water cans shall be used for drinking purposes only. Personnel shall not use drinking water for the washing of hands, face, or other body parts.

5. Personnel shall remove from service any water can that is suspected of containing tainted water. The location and status of the water shall be immediately reported to the GCI Safety Department.

6. Only Safety Department employees shall open water cans to check the contents.

7. Any water can that is opened in the field shall be immediately removed from service.

B. Drinking Fountains

1. Drinking fountains shall be used for drinking water purposes only.

2. Any drinking fountain which is defective or suspected of dispensing tainted water shall be immediately removed from service and reported to the GCI Safety Department.

C. Hand Wash Barrels

1. Hand wash barrels shall be labeled “HAND WASH ONLY.”

2. Hand wash barrels shall be used for clean-up purposes only and not for drinking.

3. Hand wash barrel plugs shall remain in place at all times.

4. Personnel shall remove from service any hand wash barrel that is suspected of containing tainted water. The location and status of the barrel shall be immediately reported to the GCI Safety Department.

LADDERS

I. PURPOSE

This procedure sets forth the guidelines for the inspection and safe use of straight ladders, extension ladders, and stepladders.

II. SCOPE

Applies to all construction and maintenance activities within the plant that are under direct or indirect (subcontractors) control of this project. This procedure does not apply to permanently mounted caged ladders or scaffold ladders which are original manufacturers' equipment and designed for direct attachment to a scaffold.

III. SPECIFICATIONS

The purchasing of ladders shall be in accordance with the specifications and restrictions as set here: Type 1A 250 lb Extra Heavy Duty.

IV. GENERAL INFORMATION

A. There are three types of portable ladders used on the project: Excavation ladders, extension ladders, and stepladders. Ladders made of wood, fiberglass, or aluminum are acceptable. No ladder is to be painted except for identification purposes as assigned by Safety Department. Extension ladders and stepladders shall be inspected and possess identification numbers. Lyondell ladders are not to be used by construction personnel.

B. Ladders should be visually inspected for up to date inspection tape and any obvious defects prior to use. Defective ladders are to be identified with "Defective – DO NOT USE" tags and removed from service immediately. Defective ladders shall also be locked securely to prevent accidental usage.

C. Retractable reels shall be used at all ladder locations according to the requirements of Fall Prevention in this manual unless otherwise stated within this procedure.

D. When ascending or descending a ladder, personnel must maintain three points of contact at all times. Employees may not carry anything that will prevent holding on with both hands. Use a handline as needed to raise and lower material or tools.

E. Keep both feet on the ladder rungs. Avoid reaching out too far or placing one foot on adjacent structures in a spread eagle stance. Change the position of the ladder as often as necessary.

F. Always face the ladder when climbing or working from it.

G. Only one person is permitted on a ladder at any time, (except two man stepladder).

H. Whenever a ladder is set up in or over a walk way, doorway, or similar thoroughfare, barricades and "overhead work" signs shall be posted.

I. Employees are required to be tied off with a retractable reel that is attached to a secure immovable overhead object when working from ladders that are placed within 4 feet of a handrail or roof edge. The exemption of a retractable reel requirement as stated in Fall Prevention, does not apply to these situations.

J. All ladders shall be tied off or otherwise secured. An employee shall only climb up a newly positioned ladder while another employee is holding it in place. The employee shall then tie off his/her lanyard to an object that will support 5,400 pounds. The employee shall tie off the ladder. Ladders shall be taken down in reverse order.

K. Ladders may not be used for any purpose other than climbing.

L. After use, return ladders to a ladder rack or storage area.

V. STRAIGHT AND EXTENSION LADDERS

A. Extension ladders shall be equipped with a tie off rope and nonskid safety feet. The tie off rope should be ½ inch diameter, 6 feet long, and attached to the third rung from the top.

B. Place ladders one foot out at the base for every four feet of length to the top support. Example: If the top of a ladder touches a wall 8 feet high, then the foot of the ladder should be 2 feet away from the wall.

C. Ladders must be tied off at the top or held in place at the bottom while in use. Never leave an unsecured ladder leaning against a support.

D. When using a ladder to gain access to an elevated work area, extend the top of the ladder at least 3 feet beyond its supporting object. When only working from a ladder, the top of the ladder must extend at least 18 inches beyond its supporting object.

E. After the extension section has been raised, check to see that the safety latches are engaged and the extension rope is secured to the bottom rung on the base section.

F. Extension sections shall be overlapped a minimum of three rungs.

G. Extension sections shall not be separated for use.

VI. STEP LADDERS

A. Stepladders come in two styles: one man and two man. Two man stepladders are limited to 8 feet in height.

B. When using a one man stepladder, climb only the side with the steps, NOT the rungs.

C. The spreaders shall be fully opened and locked. The ladder shall be set level on all four feet.

D. Stepladders shall not be used in the folded position like a straight ladder.

E. Standing on, sitting on, or straddling the top or first step down is prohibited. (As a general rule your knees should never be above the top step when working from a stepladder).

F. Tools or materials shall not be placed on the steps.

G. Stepladders are not to be used for access to elevated work areas.

H. Stepladders shall be tied off when used or otherwise secured. The user shall be tied off also.

VII. INSPECTION

A. All ladders are to receive a formal inspection on a monthly basis.

B. Ladders that pass inspection will have color coded tape applied to the inspection tag cable. Inspection tape colors and their corresponding expiration dates are indicated in Tool and Equipment Inspections.

VIII. WOOD LADDERS

A. The use of ladders with broken or missing rungs or steps, broken or split side rails, or over faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall be immediately withdrawn from service.

B. Onsite job built ladders shall be constructed of premium grade lumber free of knots, cracks, or other defects.

C. Ladders up to 14 feet in length shall be at least 2 inch by 4 inch lumber with rungs no more than 12 inch top to top. Insert blocks between each rung shall be mounted flush and cover the entire strut.

D. Ladders in excess of 14 feet shall be constructed with double strut 2 inch by 6 inch lumber on both sides. Rungs shall be no more than 12 inches apart with the insert blocks mounted flush covering the entire strut. Strut splices shall be overlapped a minimum of 3 feet.

E. Any protruding nails shall be bradded smooth.

F. Single cleat ladders shall be at least 15 inches wide but no more than 20 inches wide.

G. All ladders shall be numbered, color coded, and records started before being sent for field use.

H. Wood ladders shall not be used in operating units.

IX. EXCAVATION LADDERS

A. Ladders shall be made from extension and straight ladders that are no longer serviceable.

B. The ladders shall be used only on slopes of excavations and shall be secured to the ground.

C. If vertical access to the excavation is required such as with a shoring box an inspected extension ladder shall be used.

D. Ladders shall be painted black and stenciled “EXCAVATION USE ONLY”.

APPENDIX B

EMERGENCY PROCEDURES

I. EMERGENCY MEDICAL CARE PROCEDURES

The following information describes the procedure to be followed for the stabilization and evacuation of an injured or ill employee. The primary objective is to provide quick and efficient response without causing further injury to the employee.

All injuries must be reported to the first line supervisor. In the case of minor injuries or illness, the first line supervisor is responsible to ensure that the employee is taken to the proper care facility. If the injury or illness is severe in nature and transportation is going to be required, the Safety Department is to be notified. Following initial stabilization of the injured employee, the employee will be transported to the nearest medical facility providing the level of care required.

II. ACCIDENT INVESTIGATION

The Loss Control Manager shall investigate all incidents resulting in injury to an employee. Following treatment of the injured, the area should be immediately barricaded and no person shall be allowed in the accident site until the investigation has been performed.

III. BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

It is Graves Construction Inc. intent to eliminate or minimize all hazards associated with occupational exposure to bloodborne pathogens by the means set forth in this plan.

This plan provides precautions necessary for employees to use when occupationally exposed to blood, body fluids, and other potentially infectious materials. These materials may cause such diseases as Hepatitis B (HBV) and Human Immunodeficiency Virus (HIV). All employees that have the responsibility of administering first aid and CPR on this project are required to attend training on bloodborne pathogens, and receive the Hepatitis B vaccination prior to accepting duties that may expose the individual to potentially infectious materials. Subcontractors on the project are also required to follow and abide by the content of this plan.

Implementation of the Bloodborne Pathogen Exposure Control Plan is the responsibility of the Site Construction Manager.

Site safety managers and/or medical professionals and paraprofessionals (e.g., EMT, RN, MD) are the only employees required to administer first aid and/or CPR as a part of their duties. These are the only construction site Graves Construction Inc. employees with occupational exposure.

A. Work Practice Controls

The primary method to reduce occupational exposure will be to the following:

- Isolate or contain the hazard.

- Use disposal puncture-resistant containers that are closeable and leakproof on the sides and bottom and properly labeled with the BIOHAZARD symbol, for used needles, blades, implements of treatment, and/or other regulated waste (blood or other potentially infectious materials in a liquid or semi-liquid state). These containers must be easily accessible, kept upright, replaced routinely, and not allowed to be overfilled. When containers of regulated waste are moved, the containers must be securely closed to prevent spillage or leakage. Contractors are to make arrangements for proper and legal disposal of these materials offsite.

- Use appropriate personal protective equipment.

- Limit access to potential exposure areas.

- Have available germicide hand wipes or hand washing facilities with soap and running water.

- Prohibit storage or consumption of food, drink, tobacco, etc., or the application of contact lenses, cosmetics, lotions, or chapping balm in areas of potential occupational exposure.

B. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Employees will routinely use appropriate PPE during patient contact, handling of bodily fluids, or whenever there is a potential occupational exposure. Appropriate PPE means equipment that does not permit blood or other potentially infectious material to contact, pass through, or be absorbed onto the employee's skin, eyes, mouth, or other mucous membranes. PPE will be removed prior to leaving the work area and placed in the biohazard container.

- Disposable gloves (rubber or latex surgical type) must be properly worn whenever there is a potential exposure. Gloves shall be changed between each patient, and hands and other skin surfaces will be washed immediately after gloves are removed.
- To prevent exposure of the mouth, eyes, and nose, surgical masks and protective eye wear will be worn during procedures that may result in exposure.

- When an employee's clothes come in contact with blood or other potentially infectious materials, those clothes must be removed and treated as a biohazard.

- Saliva has not been implicated in any bloodborne pathogen; however, protective mouthpieces shall be available where the need for mouth-to-mouth resuscitating may arise.

C. HOUSEKEEPING GUIDELINES

- Implements of treatment, pails, bins, containers, or similar receptacles (including protective coverings and work surfaces), must be cleaned and decontaminated after each contact with blood or other potentially infectious material.

- Broken glassware in the treatment area must be picked up with a dust pan and broom/brush and not by hand. The broken glass must be put in a puncture-resistant container.

- All items and spills must be cleaned with a germicide or sodium hypochlorite (a 1:10 dilution of household bleach).

D. VACCINATION, POSTEXPOSURE EVALUATION, AND FOLLOW-UP

Graves Construction Inc. and each subcontractor shall select a licensed health care professional (HCP) to administer the HBV and provide postexposure medical evaluation and follow up. Employees that test negative for HBV antibodies shall be offered the HBV series (three shots over a 6 month period). Employees that decline the vaccination must sign a waiver; however, if the employee later chooses to be inoculated, he/she may do so at no cost. The signed waiver shall be placed in the employee's confidential medical file. Employees should note that the HBV vaccination is effective if received within 7 days after exposure:

- Postexposure Evaluation and Follow-Up—The selected HCP shall provide postexposure evaluation and follow-up to employees who report an exposure incident. This evaluation shall:

  - Document the routes of entry and circumstances surrounding the exposure;

  - Identify the source individual, if feasible;

  - Test the source individual's blood, if consented to;

  - Provide postexposure medical treatment and evaluation of reported illnesses;

  - Offer HBV vaccination series to exposed employees;

  - Provide counseling; and

  - Provide written opinion in accordance with 29 CFR 1910.1030(f)(5).

- Information provided to the HCP – Graves Construction Inc. shall provide the HCP who administers the HBV or postexposure evaluation and follow-up, the following information:

  - A copy of OSHA's Bloodborne Pathogen Standard.

  - A copy of the Exposure Incident Evaluation.

  - All relevant medical records in the employer's possession.

- Exposure Incident Evaluation – Exposure incidents must be reported immediately to the exposed employee's supervisor and the contractor's safety engineer. The safety engineer must immediately write an Exposure Incident Evaluation detailing the exposure in accordance with 29 CFR 1910.1030(f)(3).

E. RECORDKEEPING

The following information is to be included in these records:

- The name and social security number of the employee.
- All Hepatitis B vaccination records and medical reports.
- Copies of medical exams, tests, and follow-ups.
- A copy of the HCP's written opinion where applicable.
- A copy of information provided to the HCP.

Training records must include the dates and consent of training sessions, the name(s) and qualifications of the person(s) conducting the training, and the names and job titles of attendees. These training records must be kept for 3 years from the date of exposure.

APPENDIX C

HEAT STRESS MANAGEMENT

I. PURPOSE

The purpose of this procedure/training is to reduce the exposure to heat related injury/illness from working in high heat environments.

II. GOAL

Our goal is to eliminate heat related injuries or illnesses.

A. Common Hazards

Your body operates in a narrow temperature range. An environment that is too cold or too hot will cause the body to cease proper functions if steps to control the exposure are not taken. Extremes in body temperature elevation can be life threatening. There are many factors that affect body temperature. Some of these that can cause elevated body temperature are listed below.

1. Lack of proper fluid replacement.
2. Electrolyte imbalance – lack of electrolytes.
3. Extreme air temperature.
4. Lack of air movement – oven effect.
5. Reflected heat or sun rays.
6. Being in the direct sun (can raise apparent temperature by as much as 15 degrees).
7. Convection of heat through walls or steel.
8. Prolonged or strenuous activities.
9. High humidity.
10. Medications, diet, excess salt intake.
11. Physical fitness (lack of, weight, acclimatization).

12. Caffeine or alcohol consumption.

13. Excessive or layered clothing.

B. New Employees

The first step in managing heat stress is to determine if the new employee is used to working in the heat. A person who is not used to working in high heat conditions cannot be expected to perform as an acclimatized employee would be able to perform. The new person must be introduced to the new environment carefully. The tasks assigned must take into account the person's abilities, strength, and acclimatization. Prolonged strenuous activity or exposure to extreme heat must be limited by rotating employees until all are accustomed to the new environment. A normal acclimatization process takes 2-3 weeks to complete before the employee is comfortable working in high heat environments.

The supervisor is the key person to provide an acceptable acclimatization period with appropriate tasks to ensure the safety of the new employee. Several factors will give a supervisor clues as to whether a new employee will acclimate quickly or not.

1. Physical Fitness – a fit person will generally have a higher heat tolerance and acclimate sooner.

2. Previous Experience – Someone who has worked in a high heat environment will either be acclimated or will have better knowledge of how to acclimate themselves.

3. Fluid Intake/Breaks – A person who works steadily with regular breaks will acclimatize quicker than someone who takes sporadic and more frequent breaks.

4. Attitude – A new employee who is eager and not worried about working in the heat will acclimatize more quickly than someone who is not anxious to work in hot environments generally. Care must be taken with the eager employee because he/she may push themselves farther than they should.

C. Current Employees

This group is generally more susceptible to heat stress than some of the new employees. The employees are already acclimatized and feel that they are able to "handle the heat" or they are introduced to the heat for the first time of the season and feel that they are fine, when in fact they are not. Most feel that they can do more than they really are able to do, or are trying to complete a task before taking their break. Sometimes the experienced employee is trying to show the new employee "how to do it" and gets caught doing more than he/she should.

Awareness and education are the tools to keep the current employee out of trouble.

D. Identification of Heat Stress Symptoms

Many heat stress management programs focus on the identification of heat illnesses. While the ability to identify the particular heat stress problem is important, it is far more important to never reach the need to identify which particular heat related problem is being experienced. There are many publications which we all should have available to identify the various levels of heat stress symptoms. This procedure will focus on the prevention of heat related illnesses. The following information targets identification of INITIAL symptoms of heat stress BEFORE problems occur.

The first signs of overheating usually are feelings of being Hot, Uncomfortable, and just getting plain tired. It's not serious yet, but these are good signs that something is not as usual. It tells you that you need to change something in your environment such as more fluid, more air movement, or needing shade. The following are symptoms that can lead to more serious problems.

Dizziness	Headaches
Rapid Heartbeat	Dry Skin (No Sweating)
Nausea	Chest Pain
Cramps	Breathing Difficulty
All-Over Weakness	Diarrhea

An alert supervisor will know his/her employee's faces. Heat stress shows early in the face as being tired, very profuse sweating, off-color, and sometimes confusion. Employees that are found with any of these symptoms should be taken to a cool location BEFORE a problem occurs.

E. Proactive Measures Against Heat Stress

The best measure to take to prevent heat stress is to address it before it ever becomes a problem. Anticipate high heat days through weather forecasts and prepare for them with proactive measures. The following are a few of the things that we must do to aid in the prevention of heat related problems.

1. Begin drinking fluids early in the day – waiting until the hottest portion of the day to replenish fluids is too late. Avoid caffeine and alcohol the night before and during the day.

2. Dress for conditions. Lightweight, loose clothing is best. Avoid layering clothing underneath coveralls.

3. A well-balanced diet will help. Heavy, fatty foods do not support the body well in high heat conditions. Fruits, vegetables, proteins, and starches work best.

4. Electrolyte solutions help to maintain energy levels. Do not drink more electrolyte solution than water. Avoid taking salt tablets unless directed to do so by your physician.

5. Use sunscreen and cover your face and neck from the sun.

6. Provide shaded areas for mini-breaks and water stations as much as possible when there is no existing shaded structures.

7. Provide more than enough water and electrolyte solution to make frequent short water breaks easily accessible.

8. Strongly encourage SHORT (1-2 minute) water breaks every 20-30 minutes during high heat conditions.

9. Provide specially marked water barrels containing ice and water for soaking neck towels, arms, sleeves, bandanas, and similar items.

10. Make available through payroll deduction in the toolrooms, bandanas that can be refrigerated during the night and soaked in cold water during the day (Magic Bandana, Cool Bandana, etc.)

11. Provide specific areas for employees to go to on a scheduled basis to cool off. These would be considered mandatory breaks (in addition to the short water breaks). This should be done every 1 to 1 ½ hours. Fans and sitting areas should be provided so employees can sit with their FRC unzipped and cool down. This break should be 10-20 minutes in length.

12. Using a Thermo-Scan type instrument, monitor personnel in their work areas to assure that there are not any consistently high core body temperature problems. Core body temperature should never exceed 101 degrees. Pay particular attention to areas that have restricted airflow such as foundations, excavations, and vessels.

13. Monitor work areas for ambient temperatures. Use the heat index chart to determine the apparent temperature. Areas with apparent temperatures over 95 degrees should be monitored for personnel problems. Begin providing extra measures for the workers.

14. **MOST IMPORTANTLY** – Do not let schedule or productivity influence awareness or caution in high heat weather. Pressure from foremen or self-induced pressure is the most dangerous hazard. **This program has to be supported from the Site Construction Manager down through every level. The support must be a visible effort by all site managers from front line on up the chain. If not visible, it doesn't meant a thing!**

F. Use of the Heat Index

The heat index is a combination of the actual or environmental temperature and the relative humidity. Three stages are used to determine what action is to be taken. Listed below is a matrix of recommended actions to be taken when specific Apparent Temperatures are reached.

PROACTIVE MEASURE MATRIX

Apparent Temperature

	Level 1 90º-96º	Level 2 97º-104º	Level 3 105º-115º
Proactive Measures:			
Water Intake	1-2 cups each 20-30 minutes	2-4 cups each 15-25 minutes	4-6 cups each 15-20 minutes
Breaks	Frequent 1-2 Min. water breaks	Frequent 1-2 min. water breaks + 10-15 min. cool down breaks, shade/fans	Frequent 1-2 min. water breaks + 15- 20 min. cool down breaks, shade/fans
Fluid Supplies	Begin to provide Electrolyte Solution	Provide electrolyte solution & more than adequate water	Provide more than adequate water & elec- trolyte solution supply. Strongly encourage many short breaks.

Any work to be done in apparent temperatures above 115º F should be carefully planned and monitored by the Safety Department and Project Manager.

G. Fluid Intake

High apparent temperatures can cause the body to lose large amounts of fluid through sweating. This fluid loss must be replaced to maintain normal bodily functions. The chart below shows the effect of fluid loss in terms of weight. You can see that there is a noticeable change when fluid loss occurs.

WEIGHT LOSS EXAMPLES

Beginning Weight	Weight @ 1% Loss	Weight @ 2% Loss	Weight @ 2 ½% Loss

150	148.5	147.0	146.3
175	173.3	171.5	170.6
200	198.0	196.0	195.0
225	222.8	220.5	219.4

The “Proactive Measure Matrix” shows the recommended amounts of fluid intake. As the temperature increases, the fluid intake should increase accordingly. Electrolyte solutions such as SQUINCHER, Quick Kick, and Gatorade are beneficial in the fight against heat stress. Water is the key ingredient and the worker should never drink more electrolyte solution than water. A good rule of thumb is to drink 2-3 glasses of water to 1 glass of electrolyte solution.

Don’t wait until the temperature gets high to begin replacing fluids. The body can absorb and store excess amounts of fluids. Begin drinking water early in the day to establish a “store” of extra fluid for use when the heat rises. This will help to prevent attempts to “catch up” by drinking large amounts of water when it gets really hot. Trying to catch up doesn’t work! You must replace the fluids in a fashion which keeps the fluid intake slightly ahead of the fluid loss. Drinking large amounts of fluids in attempt to catch up can cause stomach cramps which will cause the person to throw up most of the time.

Strongly encourage short frequent water breaks in anticipation of high heat work days.

APPENDIX D

SEVERE WEATHER PROCEDURES

Graves Construction Inc. will monitor weather conditions for impending severe weather.

When severe weather is imminent, the following procedures will be followed:

- Thunderstorm/Lightning – In the event of a thunderstorm, employees will be informed to seek shelter through their Supervisors. Employees will assemble in the office trailer until given an "all clear" by the Supervisor.

- Tornado – In the event of a tornado warning, employees will assemble in the office. Supervisors will take the employees to the control building, if made of concrete block. In all other cases, Supervisors will take employees to low lying areas or ditches. Employees will remain in the shelter area until the "all clear" siren is sounded in the area.

APPENDIX E

PERSONAL PROTECTIVE EQUIPMENT FOR TOOLS

The following are the minimum requirements for Personal Protective Equipment to be used on this project for the following tools in addition to your hardhat and safety glasses. Safety glasses are not required under monogoggles. The use of gloves is mandatory on all jobs unless it causes a potential safety hazard.

Powder Actuated Tools:	Face Shield, Monogoggles, Ear Protection & Gloves
Impact Wrench:	Monogoggles, Gloves & Ear Protection
Grinder:	Face Shield, Monogoggles, Gloves & Ear Protection
Drill:	Ear Protection, Gloves & Monogoggles (Overhead)
Jack Hammer:	Face Shield, Monogoggles, Ear Plugs & Muffs, Foot Guards, & Gloves
Router:	Monogoggles, Ear Protection, & Gloves
Porta-Band Saw:	Ear Protection, Gloves & Monogoggles (Overhead)
Skill Saw:	Monogoggles, Ear Protection
Jig Saw:	Monogoggles, Ear Protection, & Gloves
Chain Saw:	Monogoggles, Ear Protection, Gloves, (Long Sleeves & Dust Mask when Cutting Creosote Timbers) & Chaps
Concrete Vibrator:	Face Shield, Ear Protection, & Rubber Gloves
Jumping Jacks:	Face Shield, Ear Protection, & Rubber Gloves
Pogo Sticks:	Foot Guards, Ear Protection, & Gloves
Sand Tamper:	Foot Guards, Ear Protection, & Gloves
Scabber:	Face Shield, Monogoggles, Ear Protection, Gloves,

& Respirator

Blow-Gun:	Face Shield, Monogoggles, Ear Protection, Gloves, & Respirator
Chipping Hammer:	Face Shield, Monogoggles (Overhead), Ear Protection, Gloves, & Respirator

* Respirator users must be Pulmonary Function Tested, Fit Tested, and Clean Shaven.

APPENDIX F

SUBSTATION GROUNDING PROCEDURE

Substation Grounding Procedure:

- Identify all possible sources of energization.
- Develop outage plan and submit for approval.
- Acquire approval of outage plan and permission to proceed from utility.
- Upon notification that area requested has been de-energized, walk through with personnel and identify all possible sources and necessary blocking points.
- Test conductors to be grounded with approved test equipment to verify they are de-energized.
- After verification that requested conductors and equipment are not energized grounding can begin.

    a. Check grounds for damage, loose connections.

    b. Check safety equipment for damage. Check gloves for current inspection, cracks or holes in rubber. Check insulating overshoes for cracks or holes in rubber. Check hot stick for damage and proper operation.

    c. Attach ground to verified grounding source. Always attach to grounding source first.

    d. Attach to conductor or equipment to be grounded using all required safety equipment; hard hat, properly rated and inspected gloves, insulated overshoes, hot stick and safety glasses.

    e. After all possible sources have been blocked by grounding, walk through work area with all personnel and identify de-energized work area. Alert personnel to all possible dangers. Identify any energized areas near work area and block access to those areas.

    f. Upon completion of work notify all personnel before removing grounds. Verify all personnel are aware that grounds are coming off and area should be considered hot. Verify all personnel are clear.

        1. Remove conductor end of grounds using all required safety equipment. Never remove grounded end first.

        2. Verify that all grounds have been removed.

g. Notify utility that work is complete, personnel and equipment are clear, all grounds have been removed.