2.6 COMPANY VEHICLES

2.6.1 Company Vehicle Use

Company owned vehicles may be assigned to employees for use in the performance of their job responsibilities for **Hardage Construction Corporation**. Only employees who have been pre-screened and approved by the Personal Department and placed on the approved driving list shall be allowed to operate company vehicles (this list may be obtained by contacting the Personnel Department). All operators shall adhere to the following rules:

1. Maintain a valid drivers license for the class of vehicle that is used.

2. Notify Supervisor and Personnel Department of any changes to license status that may occur during the course of employment.

3. Follow all traffic laws regarding vehicle usage. Each operator takes responsibility for citations and fines For any traffic violations, including those relating to loading and hauling trucks.

4. Seat belts shall be worn by **ALL** occupants. The operator is responsible for enforcing this rule.

5. Maintain the vehicle in a safe operating condition.

6. Restrict on-site speed to a **maximum** of 25 mph on the main site area, and 15mph within 100 feet of the major work or staging areas (unless otherwise directed by project specs, thence the more stringent Rule shall apply). Special site conditions may require more reduced speeds to accommodate the circumstances.

7. Vehicles shall have keys removed at all times on or off-site; and shall be locked at all times (including lock boxes) while off-site. Parking off-site shall be done with care to limit possible theft. Valuables (such as computers and phones etc.) shall not be left in vehicles over-night.

8. Drive in a **safe, courteous** and **defensive** manner at all times. Operators who have two or more accidents in a company vehicle within a one year period (regardless of fault) shall be subject to a review of their company vehicle usage.

2.6.2 Personal Vehicle Use

1. Operators using personal vehicles are subject to the same licensing and safety rules as stated above, for all periods of company business use of their vehicles.
2. Operators must carry and maintain proper insurance as required by law, and provide a certificate of Insurance to the company.

2.6.3 Accidents

Any accident involving Company Vehicles (including private, rented, or leased vehicles used in official Company business) must be reported to the driver's supervisor. If the driver is unable to make a report, another employee with knowledge of the accident must make the report.

Employees shall not comment on responsibility for which accidents occurring while an official business. It is important that such discussion be reserved for the company and its insurance carrier. The law requires that each driver involved in a vehicle accident must show its license on request by the other party.

Be sure to obtain adequate information on the drivers involved as well as the owner of the vehicles. Names, addresses, driver's license numbers, vehicle descriptions, and registration information are essential. In addition, a description of damages is needed for completion of accident reports. If the accident is investigated by off-site police agencies, request that a copy of the police report be sent to the main office or obtain the name and department of the investigating officer. A printed card titled "In Case of Accident" is kept in each official vehicle to assist in collecting required information.

In case of collision with an unattended vehicle (or other property), the driver of the moving vehicle is required by law to notify the other party and to exchange information pertaining to the collision. If unable to locate the other party, leave a note in, or attached to, the vehicle (or other property) giving the driver's name, address, and vehicle license number.

The driver of any **Hardage Construction** vehicle in an accident must also complete a Company Motor Vehicle Accident Report and submit it to its supervisor within one work day of the accident. (See Motor Vehicle Accident Report Form #200-6/98).

The supervisor shall interview the driver and complete the supervisor's portion of the report. Within two work days of the accident, the completed form and vehicle must be taken to the main office so that damages may be estimated and repairs scheduled.

A substance abuse test is required, if you are involved in, or have been working in the vicinity of, a non-injury property accident with an estimated cost greater than $500 during work hours or at any time while operating a company vehicle or other equipment, on or off the jobsite. (Refer to Substance Abuse Program, Section 2.2).

DRIVERS REPORT OF ACCIDENT

Insurance Company Policy No._____

Date of Accident_____
Time_____
Place of Accident _____
_____
Road Conditions_____
Weather Conditions_____
Your Direction_____**Speed**____
Direction of Other Car_____**Speed**____
Police Report Taken?_____**Rep. #**____
Name of Police Dept._____

Policeman's Name_____
Badge#_____
Was Summons Issued?_____**To Whom**

INJURED PERSONS

Name_____
Address_____
Nature of Extent of Injury_____
_____

Name_____
Address_____
_____
Nature & Extend of Injury_____
_____

Name_____
Address_____
Nature & Extend of Injury_____

Your Vehicle (1)

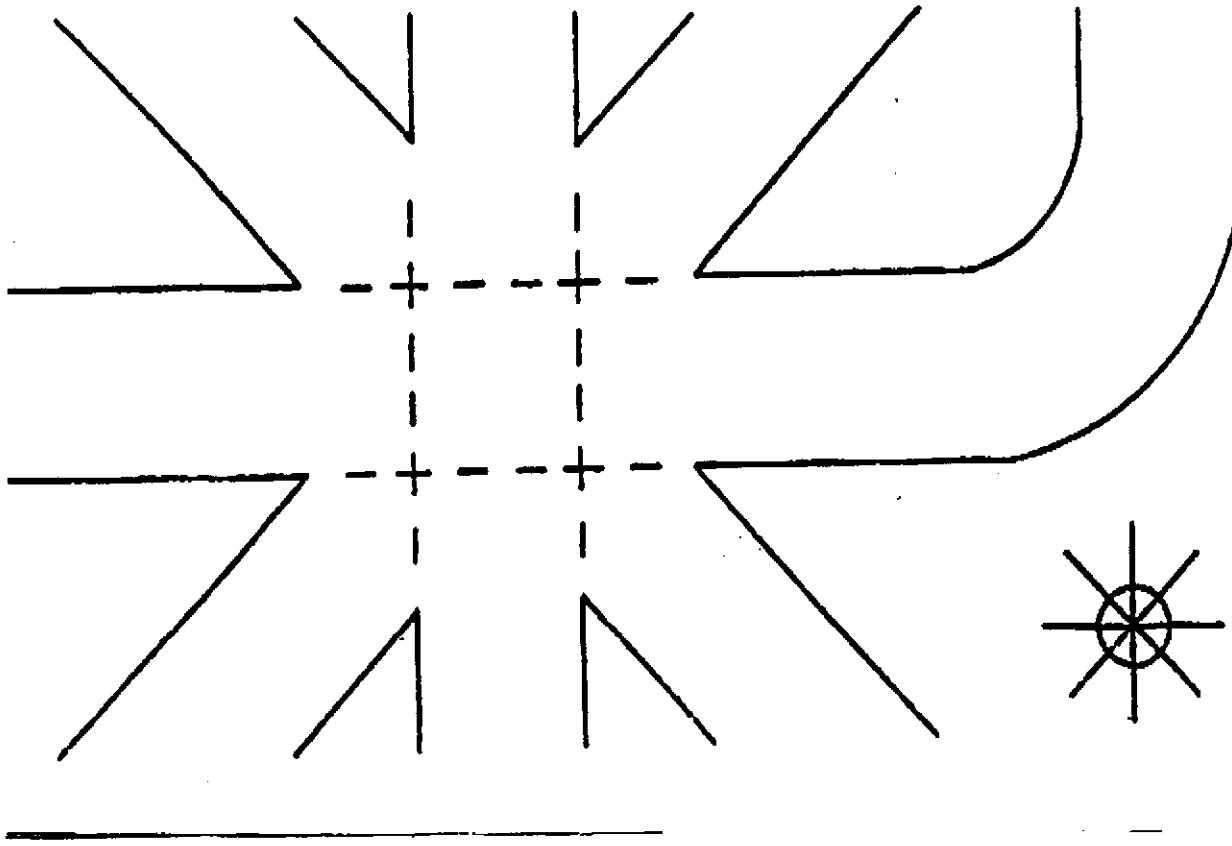
Owner _____
Address_____
Make, Model, & Yr._____
Vehicle Number_____
Vehicle Lic. #_____
Driver_____
Drivers Address_____
Dirver's Lic. #_____
Damaged Part (s) of Car_____
_____

Owner_____
Address_____
Make,Model, Yr._____
Vehicle Number_____
Vehicle License_____

Driver _____
Drivers Address_____
Drivers Lic. #_____
Damaged Part(s) of Car_____

Owner_____
Address_____
_____
Make, Model. Yr. _____
Vehicle Number_____
Vehicle Lic.#_____
Driver_____
Drivers Address_____
Driver's Lic. #_____
Damaged Part(s) of Car_____

Form #200-6/98



On the above diagram, show the position of each car at the time of the accident. Use rectangles or squares to indicate each car and number them (Veh. # 1, Veh. #2, etc.) Indicate the direction of travel of each by arrows. Indicate traffic signs or signals. Also, indicate "North" on the diagram. Show any stationary objects involved in the accident.

NARRATIVE REPORT: Briefly describe accident; Add pertinent comments not covered on first page.

3.0 (Reserved - To be used at a later time)

4.0 PROJECT SAFETY/PLANNING AND PROCEDURES

4.1 PROJECT HAZARD ANALYSIS PLAN

Prior to the start of work, **Hardage Construction** Project Superintendent (s) and Project Manager shall meet with Safety Department to create a written hazard analysis for jobsite safety responsibilities and review jobsite safety requirements and policies. This written hazard analysis shall include, but not limited to: Emergency Action Plans, Accident Response Procedures, Housekeeping, Trenching and Excavation-Blasting, Confined Spaces, Concrete and Masonry, Fall Protection, Scaffolding, and Electrical safety. The key emphasis is to analyze areas of safety that may have been excluded or overlooked in the Subcontractor bidding process.

This written hazard analysis shall be placed in the front of the Hardage Construction Corporations Inspection Logbook for easy access, and should be reviewed throughout the construction process to assure all phases of safety are attended to.

4.2 PRE-CONSTRUCTION SAFETY MEETINGS

Prior to the start of work, **Hardage Construction**'s job Superintendent and Project Manager shall meet with Subcontractor (s) to re-enforce Subcontractor (s) jobsite safety responsibilities and to review jobsite safety requirements and policies agreed with via contract by the Subcontractor management. Pre-construction Safety meetings shall be conducted in accordance with and documented on the **"Hardage Construction Corporations Pre-Construction Safety Meeting"** checklist (Refer to Form #300-6/98).

Hardage Construction Corporation

SUBCONTRACTOR PRE-CONSTRUCTION SAFETY CHECKLIST

Job Name: **Subcontractor:**

Job Location: **Date:**

1. Per **Hardage Construction Corporation's** Construction Subcontract, the Subcontract shall:

- Provide **Hardage Construction Corporation** with a copy of their written safety program for review.
- Provide **Hardage Construction Corporation** with a copy of a written Hazardous Communication Program and Material Safety Data Sheet (s).
- Comply with jobsite housekeeping policies.
- Be responsible for their own employee (s) safety as well as for the safety of their suppliers and tier Subcontractors.
- Comply with all applicable Occupational Safety and Health laws, standards and environmental laws.
- A "Competent Person" shall be designated.
- Comply with any and all Safety and Health rules directed by the Owner or his representatives.
- Establish appropriate Safety policies, Accident Prevention and Safe Work procedures for their employees.
- Conduct inspection and inventory to determine the safe work conditions are monitored and that safe equipment is provided to their employees.
- Comply with <u>all</u> **Hardage Construction Corporation's** Safety measures and job policies.
- Report all injuries in writing, immediately to **Hardage Construction Corporation.**
- Provide a copy of the Accident Investigation Report to **Hardage Construction Corporation.**

***The Subcontractor is responsible to inform its employees of all jobsite rules, policies and regulations.**

2. Review **Hardage Construction Corporation's** Safety Code.

3. Ensure that jobsite personal protective equipment is available and utilized by their employees.

4. Ensure that other specific job safety or security rules and/or policies are adhered to.

Form #300-6/98

4.3 DAILY JOBSITE SAFETY INSPECTIONS

Each project shall be issued a **JOBSITE SAFETY INSPECTION LOGBOOK** which shall be used through the course of the project by the Superintendent to make daily written safety inspections of the site. The inspection form (Refer to Daily Safety Inspection Report – Form #400-6/98) in the LOGBOOK shall be utilized with special emphasis on listing the safety infractions noted, AND listing the corrective action taken. The form shall be signed and dated with the time of inspection also noted. In order to establish a disciplined routine and sense of importance to the Subcontractors, the inspections shall be made at approximately the same time at the start of the work shift. Questions which may arise during the inspections which are not safety related should be detained until the inspection is complete. **This inspection period is solely for safety; do not combine it with other, general site inspections.** In the event that multiple work shifts occur on the project, an inspection is required at the start of each shift.

During daily inspections all noted unsafe acts or conditions, violations of OSHA standard (s), or violations of **Hardage Construction Corporation's** Safety rules and/or policies must be reported directly to the violating Subcontractor's jobsite Supervisor for immediate corrective action.

The following are procedures which are to be implemented if an unsafe act, unsafe condition or violation is noted:

1. Notify the violating Subcontractor's field supervisor of the violations (s).

2. Specify a time period for the violation to be corrected.

3. Document verbal warning in daily logbook, jobsite safety inspection logbook.

4. **First re-inspect;** to verify the violation has been corrected. If the violation has not been corrected within the directed time, a written warning must be issued. Specify deadline for correction.

5. **Second re-inspect;** if corrective action has not been taken, a second written warning must be issued with copies forwarded to Hardage Construction Corporation's Safety Department and to the Subcontractor's top management..

6. **Third re-inspect;** if corrective action has still not been taken, notify Hardage Construction Corporation's Safety Department by phone immediately to initiate corporate disciplinary action.

***Note:** If the exposure presented by the violation is serious and there is a substantial probability of death or serious physical harm, the Superintendent shall take immediate actions, including stoppage of work, until the violation is corrected.

4.4 HARDAGE CONSTRUCTION CORPORATION - SUBCONTRACTOR SAFETY MEETINGS

Subcontractors of **Hardage Construction Corporation** are required to conform with all Federal and State Safety and Health regulations; and if applicable, Owners safety rules. Each Subcontractor is responsible for providing its own employees with a safe work environment and is required to provide safety training and education to all employees under their control.

The purpose of **Hardage Construction Corporation** - Subcontractor Safety meetings are to supplement the Subcontractors' loss prevention program and to increase overall jobsite safety awareness. It is not meant to replace Subcontractors' responsibilities for employee training/education or work safety.

Hardage Construction Corporation - Subcontractor Safety meeting objective is to provide a forum for the Superintendent to re-emphasize **Hardage Construction Corporation's** commitment for jobsite safety, and to remind contractors of their safety responsibilities for their employees and to other contractors on the project. The **Hardage Construction Corporation's** - Subcontractor Safety meeting should provide a forum for intra-contractor and general contractor safety discussions which will mutually benefit all contractors on the jobsite.

The **Hardage Construction Corporation's** - Subcontractor Safety meeting may be a stand-alone Safety meeting or incorporated into weekly scheduling and planning meeting.

Hardage Construction Corporation – Subcontractor Safety Meeting Agenda

Frequency:

1. **Hardage Construction Corporation** – Subcontractor Safety meetings shall be held weekly. (Safety meetings should be held on the same day at the same time each week in order to allow for consistent scheduling and participation by all Subcontractors).

Attendance:

1. Representatives for Subcontractors working on the project are required to attend **Hardage Construction Corporation's** – Subcontractor Safety meetings. Subcontractors shall be represented by their jobsite supervisor.

Length of Meeting:

1. No Limit. (There is no set safety meeting time length; however, most meetings typically take 15-30 minutes). Schedule appropriate time to cover your agenda.

Meeting Contact:

1. Review the coming week's jobsite work activities and the hazards and the controls which will be associated with the work. Discuss job activities with the Subcontractors and plan for doing the jobs safely and efficiently. (For example: it may be learned that framing will be completed to a stage that temporary stairways can be installed in order to provide easy access to other trades. Framing contractors may inform attendees that skylight roof openings will be cut and framed in; however, the skylights are back ordered and will not be installed until the next week. The openings will need to be covered prior to any other Subcontractor entering the roof areas).
2. Review general jobsite safety issues and discuss corrective actions (for example, fall protection, equipment guarding, scaffolding, personal protective equipment, housekeeping, fire protection, etc.).
3. During Safety meetings, which will follow the Hardage Construction Corporation's formal monthly Safety jobsite inspections, review safety inspection findings and discuss substandard conditions noted.
4. Review and discuss accidents or loss time injuries.
5. Recognize those contractors which are working safety and complying with Hardage's safety requirements.
6. Re-emphasize and re-enforce Hardage's commitment to jobsite safety.
7. Document the date, time and agenda items discussed during the Safety meeting. Have all Subcontractors attending the Safety meeting sign an attendance sheet.
8. The Subcontractor Safety Meeting Agenda is a flexible guide which is intended to provide Superintendents with a general meeting outline. Participation and communication between all Subcontractors attending the Safety meeting is important, and every effort should be made to encourage discussion. In directing the Safety meeting discussions, all Superintendents should remember the three points to achieve success:

4.5 MONTHLY PROJECT SAFETY REVIEW

A monthly project safety review shall be conducted for each project in progress. Attendees will include the Officer in charge of projects, Project Manager, Project Superintendent (if available), Safety Manager or Safety Director.

Topics to be discussed:

Jobsite Accidents - Hardage and Subcontractors

Safety Inspections: By Hardage, OSHA, or insurance company.

Discuss Phases of construction - - Review job hazard analysis.

Daily safety inspections being performed by Project Superintendent.

Safety Budget.

4.6 SUBCONTRACTORS

The Hardage Safety Program was developed to help create a safe work environment for everyone on our projects. This can only be accomplished through cooperative effort. All Subcontractors are required to comply with Hardage's Safety Rules as well as applicable OSHA standards.

Subcontractors employees shall be trained in all OSHA standards applicable to their work; and additionally submit have a written safety program for review to Hardage before work starts. This program must address work performed by the Subcontractor on this project. It must be signed by the Subcontractor supervisor who will be responsible to monitor the safety of your employees on the project.

This is especially applicable to contractors performing high hazard work such as: Excavation, Steel Erection, Work at Elevations above 6 feet in heights, Chemical and/or Confined Spaces, Scaffolding, or Cranes and Rigging.

Subcontractor foreman will be required to conduct weekly safety meetings with the field crew while on our projects, as well as attending weekly project meetings with the Project Superintendent wherein safety and schedule coordination will be discussed.

The following safety requirements apply to **all** Subcontractors performing work on a Hardage project, and are to be included in the subcontract documents.

Subcontractor Safety Requirements

1. General Safety Rules
Subcontractor shall take proactive safety precautions with respect to all aspects of its work involved in this project. This shall include the establishment of a structured and enforced **SAFETY PROGRAM** including project safety planning, training/education, identification on competent persons and on-site enforcement of all safety rules, including those imposed by Subcontractor, Contractor, or Project Owner. In addition, Subcontractors shall comply with all applicable governmental safety and health laws, ordinances, rules and regulations relating to work on this project. Subcontractor shall be responsible for any costs, fines, or other penalties assessed against Contractor resulting from the Subcontractor's failure to comply with any of the above. Subcontractor shall also be responsible to enforce the above stipulations with its Subcontractors and vendors while on this project.

2. Subcontractor Safety Program
Subcontractor's safety program shall be formal and written. This program shall contain a disciplinary means of controlling safety, including provisions for employee removal from the jobsite for lack of compliance. All of its employees shall be versed in the requirements of its safety program and shall be required to follow its directive **At the request of the Contractor, a copy of this program shall be provided to Contractor.** In addition, statistical safety information regarding Subcontractor's safety history may be requested by the Contractor regarding Subcontractor in general, as well as the specific employees assigned to this project. Information which may be requested includes Subcontractor's OSHA 200 log or Worker's Compensation Experience Modifier data. A history of excessive safety infractions, as defined by OSHA citations or insurance recommendations, by any personnel of Subcontractor sent to this project may be grounds for Contractor to require Subcontractor to replace those personnel with employees having a safety records acceptable to the Contractor.

3. **Safety Equipment/Signs/Barricades**

Subcontractor shall furnish and enforce the use of all safety equipment as needed for its operation to comply with the above regulations. All such equipment shall be OSHA or A.N.S.I. specified, and installed per OSHA standards. **ALL SAFETY EQUIPMENT SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.** Subcontractor shall be responsible for posting any safety signs to advise its employees and others of dangerous areas or hazardous working conditions related to its operations. In addition, Subcontractor shall furnish all barricades and flag men as required for any portion of its work under this subcontract. All such barricades shall remain in place and be maintained in a safe condition until the area is no longer a safety hazard.

4. **Safety Code**

In addition to the above listed regulations, Subcontractor shall abide by the Contractors **SAFETY CODE** (see attachment). While not excluding any portions of the code or other regulations, this Contractor emphasizes the following items for compliance by all of Subcontractors' employees, vendors and visitors without exception:

A. Hard hat shall be worn at all times.
B. Long pants; shirts with sleeves.
C. Hard cover shoes or boots (no sandals or canvas athletic shoes).
D. No alcohol or drug use anywhere on or adjacent to the jobsite (including Subcontractor yards) at any time before, during or after work. This also includes such use in parking areas adjacent to the site. **Subcontractors Are Liable For Search Of Work Site, Including But Not Limited To Work Areas, Trailers, Tool Boxes And Vehicles, If Any Indication Of Alcohol And/Or Illegal Substance Abuse Is Observed.**
E. No radios or tape players, either with open speakers or headphones, or any other non-work related devices which might distract employees.
F. Absolute compliance to safety in all areas with risk of falls including roof edges, roof and floor openings, stairways, lifts, pits, trenches, scaffolding, ladders, and any other areas where falls are a risk. Any barricades removed by Subcontractor shall remain open only for the duration of the necessary operation and shall then be immediately reinstalled. In addition, during the time of a barricade removal, a Subcontractor's representative shall be posted as a safety watch in view of the unguarded area to warn others of the condition.
G. Compliance with the proper use of all equipment and tool safeguards.
H. No fires on-site without permission of Contractor. ONLY THE USE OF APPROVED HEATERS.
I. Any torch work or other open flames occurring adjacent to wood framing or other flammable materials shall be accompanied by a fire extinguisher at the point of work; the adjacent flammable area shall be sprayed down with a water bottle, and a fire watch shall follow for a minimum of 30 minutes after the work is complete.

5. **Supervisory and Employee Education**

Subcontractor's employees shall be thoroughly educated in the inspection and safe use of all tools, machinery and equipment required for their work. **SUBCONTRACTOR'S EMPLOYEES SHALL BE PROPERLY EDUCATED IN ALL OF THE APPLICABLE OSHA REQUIREMENTS** which include, but are not limited to, all crane, forklift, tool and equipment operators. In addition,

Subcontractor's employees shall be educated in the safe methodology of the work itself, including proper sequencing, lifting techniques and general hazards of the specific trade in question. Subcontractor's personnel shall also be educated in proper emergency procedures. This education shall include an analysis of any special procedures which may be necessary for the conditions of this project. Through the course of this project, Subcontractor shall pre-plan all work, and identify and inform its employees of any hazards specific to this particular project, whether within the responsibility of this Subcontractor or others. Where the Contractor feels that a serious safety risk exists by nature of Subcontractor's work or proximity to hazardous conditions, Contractor may require Subcontractor to provide a written safety program for that specific phase of work.

6. Crane Safety Certification

Subcontractors using cranes shall comply with all crane safety and material handling requirements of OSHA. In addition, prior to start of crane work, Subcontractor shall supply Contractor with a copy of current annual inspection and load testing certification. Inspection compliance status shall remain current throughout the duration of work on this project.

7. Subcontractor's Daily Safety Inspections

Subcontractor's supervisor shall make a formal written **DAILY** safety inspection of their area of operation at the start of each working day, and shall make immediate corrections to any unsafe conditions observed. If safety risks are noted which are the responsibility of others, the supervisor shall immediately notify Contractor's Superintendent of same. The inspection shall be written in a log format and state the area inspected, any hazards noted, and corrective action taken. It shall be dated and signed by the supervisor, and shall be provided for inspection by Contractor's Superintendent at the weekly Subcontractor meetings.

8. Weekly Subcontractor Meetings

Subcontractor's jobsite supervisor shall attend weekly Subcontractor meetings held by Contractor, and shall be responsible to communicate any safety hazards found on site since the last meeting as well as any new hazards associated with upcoming phases of work about to start.

9. Weekly "Tailgate" Safety Meetings

Subcontractor's jobsite supervisor shall conduct "tailgate" safety meetings with all of its employees on site on a weekly basis. These meetings shall cover safety topics relating to its trade as well as specific to the hazards of the site itself, including safety topics discussed in the weekly Subcontractor meetings. The "tailgate" meeting notes shall be written and include a signature page of all those in attendance. A copy of the these meeting notes and the signature page shall be given to the Contractor's Superintendent each week.

10. Accident Reports

Subcontractor shall supply Contractor with a written report of any accident involving its employees or others if caused by Subcontractor. The report shall list the details of the incident and any witnesses to the event. In the event that an accident causes a death or injury requiring emergency treatment,

Subcontractor shall cease work in that area and leave it undisturbed until an investigation can be completed.

11. Bloodborne Pathogens

If an accident occurs on the jobsite and blood or other bodily fluids are released, all Subcontractors must comply with the OSHA standard regarding Bloodborne Pathogens 1910.1030 for the proper clean up and disposal of bodily fluids.

12. Hazard Communication

Subcontractor is required to have a **Written Hazard Communication Program** on site and shall supply the Contractor's Superintendent with copies of any **Material Safety Data Sheets (MSDS)** relating to products used in Subcontractor's operation on site. Subcontractor shall also inform other trades of the use and precautions of any hazardous materials in the vicinity of its operation. This information shall be conveyed during the weekly Subcontractor meetings.

13. Excavations and Competent Person Designation

Subcontractors involved in any trenching or excavation work shall be thoroughly knowledgeable of the OSHA standards relating to same. During the entire phase of the work, Subcontractor shall have on site a designated "competent person" qualified to fulfill OSHA requirements for trenching and excavation. The competent person shall have sole responsibility to pass judgment on soil types, conditions, shoring, sloping and any other details relating to the requirements of the work.

14. Clean work Areas

Subcontractor shall maintain a neat, orderly and non-congested work area free of any tripping hazards. **Clean up of work areas shall be performed on a daily basis.**

15. Safe Attitude and Discipline

This Contractor maintains a strict safety program for two important reasons:

A) To protect all employees against specific safety hazards.

B) To create an environment where employees will feel safe and be able to work in a clean, organized and efficiently run operation, and thereby be able to achieve optimum production capacity and product quality.

To ensure this goal, this Contractor mandates complete adherence to this program by **ALL** personnel on site. It is difficult and unfair to enforce safety rules in some areas only, or with select trades but not others. This project will be run as a disciplined, quality oriented enterprise, and a strongly enforced safety regimen will be enforced to assist in that goal. To attain that success, Subcontractor shall ensure that all of its employees are informed of the safety requirements of this contract, will maintain an agreeable attitude regarding project safety, and will comply with all regulations without being constantly monitored by the Contractor. Subcontractor shall make immediate corrections to any violations noted by

the Contractor, its insurance consultants, or OSHA consultation and compliance officers. Repeated safety warnings by the Contractor to Subcontractor, either verbal or written, shall be grounds for replacement of Subcontractor's employees with those willing to abide by Contractor's safety regulations.

At all times, Subcontractor shall be responsible for full control of safety regarding its operation on this project. This program, including any inspections by Contractor or other entities, or rules outlined in this document are to be instituted as an assistance to Subcontractor in maintaining a safe operation. They are not intended to supersede Subcontractor's responsibility for its own inspections and general safety compliance.

These Safety Requirements are not to be considered "all inclusive", rather as general guidelines. Where any portion of these standards are in conflict with, or less stringent than, any applicable Federal, State or local statutory safety regulations, then statutory regulation takes precedence.

4.7 EMERGENCY ACTION PLAN

An emergency action plan shall be written on all projects by the Project Superintendent and shall cover those designated actions employers and employees must take to ensure emergency safety from fire and other emergencies.

Elements: The following elements, at a minimum, shall be included in the plan:

1. Emergency escape procedures and emergency escape route assignments.
2. Procedures to be followed by employees who remain to operate critical operations before they evacuate.
3. Procedures to account for all employees after emergency evacuation has been completed.
4. Rescue and medical duties for those employees who are to perform them.
5. The preferred means of reporting fires and other emergencies.
6 Names and regular job titles of persons who can be contacted for further information or explanation of duties under the plan.

The emergency action shall be reviewed by the Company Safety Manager and placed in the front of the Safety Manual.

5.0 ACCIDENT PROCEDURES

5.1 Accident Response Procedures

The goal of the Hardage Construction Corporation Safety Program is the prevention of accidents. Should an accident occur on the job, we must be prepared to handle it effectively. A site specific Emergency Action Plan must be posted in the project office. In the event of a very serious or fatal accident, the following procedures must be followed:

1. Immediate first aid, transportation or professional medical treatment must be provided. Stabilize the victim and call for help.

2. Contact emergency medical transportation and hospital listed on the Emergency Action Plan.

3. Clear a path and direct emergency vehicles to the area. A pre-determined path shall be in place and noted in the Emergency Action Plan.

4. Secure the accident area for a thorough investigation.

5. Immediately notify the Hardage Safety Department. The Safety Department shall notify OSHA within 8 hours if the accident is a fatality or involves serious multiple injuries.

6. The Superintendent or Foreman will accompany or follow the injured worker to the hospital.

7. The Foreman and Superintendent will fill out an accident report form and Hardage Construction report of accident. The Project Manager shall initial the accident report. They must be submitted to the Hardage Safety Department by the end of the day of the accidents.

8. Arrangements should be made by the Foreman or co-workers to secure the injured worker's tools and personal belongings.

9. Work will not continue in the area of work involved in the accident until cause has been identified and corrective action to prevent reoccurrence taken.

10. The Project Superintendent or Foreman will notify appropriate family members of the accident victim.

5.2 HEALTH AND FIRST AID

1. **Accident** - Refer to Accident Procedures section.

   A. **Training** - Do no attempt to administer first aid if you are not properly trained or certain of what to do.

2. **Burns** - Immediately treat acid, caustic and thermal burns by flushing with cold water for at least 5 minutes, then report promptly for further first aid.

3. **Electrical Shock** - Turn electric power off or use a dry board, stick or other non-conductive object to remove the contact from the victim. Do not touch the victim until he or she is free from the current contact. If breathing has stopped, begin CPR and mouth-to-mouth resuscitation immediately.

4. **Heat Exhaustion** -

   A. Symptoms:
   Pale, clammy skin
   Pulse rapid and weak
   Complains of weakness, headaches, nausea
   May have cramps in abdomen or limbs

   B. Treatment:
   Call Emergency Medical Team
   Have victim lie down with head lower than his body(face pale-raise tail)
   Treat for shock and protect from chills
   If conscious, give sips of cool water.

5. **Heat Stroke** -

   A. Symptoms:
   Flushed and hot skin
   Pulse rapid and strong
   Victim often unconscious
   Enlarged pupils
   High temperature

   B. Treatment:
   Call Emergency Medical Team
   Cool body with cold water or cold applications
   Do not give stimulants (alcohol, tea, coffee, or ammonia water)
   Keep victim comfortable - head slightly raised (face red - raise head)

6. **Serious Bleeding** - Do not delay, call the Emergency Response Team, and immediately provide emergency first aid. Severe bleeding must be stopped at once.

Treatment:
Put on rubber gloves prior to assisting victim.
Bleeding can usually be controlled by pressing pads of cloth directly over the wound. Gauze, clothing or material can be used, the cleaner the better. Use finger pressure until you can get a thicker dressing over the wound. When bleeding is controlled, add more layers of cloth and bandage firmly. Use more cloth if first pad soaks through - do not remove. Elevate limb if wound is on arm or leg.

Do not use a tourniquet except as a last resort and only if you are formally trained in first aid. It is rarely necessary.

7. **Shock(Traumatic)** -

Symptoms:
Cold clammy skin
Perspiration beads on forehead and palms
Pale face
Complains of chills or has shaking chills
Nausea
Shallow breathing
Enlarged pupils
Pulse weak and rapid
Slow to respond

Treatment:
Call Emergency Response Team
Treat for shock in case of all serious injuries whether symptoms are present or not.
Keep victim lying down
Keep victim warm (not hot) by placing blanket or cloth under and over them
Give plenty of fresh air
Do not give alcoholic beverages. Do not give fluids
Treat the injury that caused the shock

8. **Stopped Breathing** - Do not wait for the Emergency Response Team when a person's breathing has stopped. Begin first aid immediately.

Treatment:
Mouth-to-Mouth Resuscitation

9. **Snake and Insect Bites -**

Treatment:
Call Emergency Response Team
Have victim lie down and keep as calm as possible
Apply constriction bandage around arm or leg above and below the bite if bite is on the arm or leg.
Do not tighten bandage too tight (pulse should not appear, nor should it cause a throbbing sensation)
Do not give stimulants (alcohol, coffee, or tea)

10. **Sanitation -**

Potable Water: An adequate supply of potable water shall be provided in all work places. Containers used to dispense drinking water shall be capable of being closed, and equipped with a tap. Water shall not be dipped from containers

Containers used to distribute drinking water shall be clearly marked as to the nature of its content, and not used for any other purpose.

The common drinking cup is prohibited.

Where single service cups are supplied, both sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

Toilets: Toilets shall be provided for employees according to the following table:

Number of Employees	Minimum Number of Facilities
20 or less	1
20 or more	1 toilet seat and 1 urinal per 40 workers
200 or more	1 toilet seat and 1 urinal per 50 workers

Washing facilities: Adequate washing facilities shall be provided for employees engaged in the application of paints, coating, herbicides, or insecticides, or in other operations where contaminants may be harmful to employees.

Vermin control: Every enclosed workplace shall be constructed, equipped, and maintained, so far as reasonably practicable, to prevent the entrance or harborage of rodents, insects, and other vermin.

Eye wash facilities: Eye wash facilities are required when employees are to handle or use poisons, caustic, and other harmful substances.

Non-ionizing radiation (Lasers): Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

Proof of qualification of the laser equipment operator shall be available and in possession of the operator at all times.

Employees, when working in areas in which potential exposure to direct or reflected laser light greater than 0.005 watts (5 milliwatts) exists, shall be provided with anti-laser eye protection.

Areas in which lasers are used shall be posted with standard laser warning placards.

5.3 FIRST AID/C.P.R. TRAINING

First-aid and C.P.R. training will be offered to all **Hardage Construction** personnel. This training shall be used on a voluntary basis, this training is not part of your job description. These persons trained are not required to perform First Aid and/or C.P.R. on any person. If you do choose to perform First Aid and/or C.P.R., you will be giving aid under the Good Samaritan Law.

If there is an accident that involves the release of bodily fluids, the Bloodborne Pathogen Policy shall be in force. The following is an outline of the Bloodborne Pathogen Policy:

5.4 BLOODBORNE PATHOGENS

Hardage Construction in compliance with OSHA Standards for Occupational Exposure to Bloodborne Pathogens, has established this policy and procedures to prevent exposure to bloodborne infections diseases from contact with blood or bodily fluids. While risk to employees is considered **very low**, information and training of safe work practices its important.

The following procedures shall be adhered to:

1. **Barriers protection at all times.**
   - **A.** All employees shall use appropriate barrier protection to prevent skin and mucous-membrane exposure when contact with blood or other fluids is anticipated.
   - **B.** **Gloves** shall be worn for touching blood and bodily fluids, mucous-membrane, or non-intact skin of any person, or handling items on surface soiled with blood or body fluids.
   - **C.** **Mask and protective eye wear or face shield** should be worn during procedures that are likely to generate splashes of blood or other body fluids to prevent exposure of mucous-membrane of the mouth, nose, eyes. Goggles are preferred which cover the entire eye area and eye glasses, if worn.

2. **Wash hands if containment with blood or other body fluids.**
   - **A.** Hands should be washed immediately after gloves are removed. Always use an appropriate soap and copious amounts of water when washing hands.

3. **Avoid Accidental Injuries**
   - **A.** All employees should take precautions to prevent injuries caused by needles, broken glass, saw or knife blades, razor blades, sharp metal or glass edges and other sharp materials or devices when performing job tasks, during disposal of trash and when cleaning up blood or body fluid spill.
   - **B.** All sharp items should be picked up with **tongs** and placed in a **puncture-resistant container for disposal.**
   - **C.** **Puncture-resistant containers** should be carried as part of the blood or body fluid clean up kit. Resistant labels should be labeled for Biological Waste and should state that they are for sharps (razor blades, knives, etc.) Needles, broken glass, etc. Large items should

be handled carefully. Get help if necessary. For disposal, wrap large items in several layers of newspaper, place in trash bag, and tape closed. Label: Bio-Hazard items when necessary.

4. **Avoid direct mouth-to-mouth resuscitation contact.**
   - **A.** Call 911 first. If CPR is to be performed, use a CPR mouth shield from the First Aid Kit.
   - **B.** Discard as Bio-Hazard Waste in appropriate container after use.

5. **Decontaminate all surfaces and devises after use.**
   - **A.** Chemical germicides that are approved for use as "hospital disinfectant" and are tuberculocidal (such as Lysol) when used as recommended dilutions can be used to decontaminate spills of blood and other body fluids. These are recommended for use on carpet. A dilution of hypochlorite (household) bleach and water (1:10) can also be used, especially for cleaning rubber gloves and tools.
   - **B.** With large spills, the contaminated area should be flooded with a liquid germicide before cleaning decontaminated with fresh germicidal chemical. At all times, gloves should be worn during the cleaning and decontaminating procedures.

If in the event there is an exposure, a Report of Work Exposure to Bodily Fluids shall be completed and submitted to the Main Office. (Refer to Form #500-6/98).

REPORT OF WORK EXPOSURE TO BODILY FLUIDS

Name **Soc. Sec. No.**_____

Last **First** **M.I.** **Birth Date**_____

1._____ **Phone No.**_____

2. Address_____City_____State_____Zip_____

3. Employer's Firm's Full Name_____

4. Employer's or Firm's Address_____

5. Date of Exposure_____Time_____A.M._____P.M._____

6. Address or Location of Exposure_____

7. Job Title_____

8. State fully how the exposure occurred (be specific)_____

_____

_____

9. List all persons present at the exposure whom you can identify_____

_____

_____

10. What bodily fluid were you exposed to?

Blood_____ Any other_____

(Describe)_____

_____

11. Who did the bodily fluid come from?_____

(Explain)_____

12. Are you aware of a break/rupture in the skin or mucous membrane at body location to bodily fluid?

Is so, please describe_____

_____

_____

_____

13. Did exposure to bodily fluid take place through your (a) skin_____(b) mucous membrane?_____

14. What specific part (s) of your body was exposed to bodily fluid?_____

_____

_____

OTHER REQUIRED STEPS:

A. **YOU MUST HAVE BLOOD DRAWIN NO LATER THAN TEN (10) CALENDAR DAYS AFTER EXPOSURE.**

B. **YOU MUST HAVE BLOOD TESTED FOR HIV BY ANITBODY TESTING NOLATER THAN THIRTY (30) CALENDAR DAYS AFTER EXPOSURE AND TEST RESULTS MUST BE NEGATIVE.**

C. **YOUMUST BE TESTED OR DIAGNOISED AS HIV POSITIVE NO LATER THAN EIGHTEEN (18) MONTHS AFTER THE EXPOSURE.**

D. **YOU MUST FILE A WORKERS' COMPENSATION CLAIM WITH THE INDUSTRIAL COMMISSIN OF CALIFORNIA NO LATER THAN ONE YEAR FROM THE DATE OF DIAGNOSIS OR POSITIVE BLOOD TEST IF YOU WISH TO RECEIVE BENEFITS UNDER THE WORKERS' COMPENSATON SYSTEM.**

I HAVE FILED THIS FORM WITH MY EMPLOYER AND HAVE RECEIVED A COPY OF THIS COMPLETE FORM.

Employee Signature_____Date_____

Form #500-6/98)

5.5 ACCIDENT REPORTING AND INVESTIGATIONS

All jobsite accidents shall be investigated. Accidents involving Subcontractor employees shall be reported to the **Hardage Construction** Project Superintendent and investigated by the Superintendent and the Subcontractor.

Accidents by subcontractors shall be followed by a written report which specifies an injured employee (s) names(s) type of injury (ies), how the injuries occurred, detailed information on corrective action taken to prevent similar accident reoccurrences, and submitted to the Superintendent for review. If the Subcontractor does not have an Accident Investigation form, the Superintendent shall provide the Subcontractor with **Hardage Construction** Accident Investigation Report (Refer to Form #501-6/98) to document the investigation.

Should an accident occur, the Project Superintendent shall take the following actions:

1. See that the injured person receives immediate and adequate medical attention, and make every effort to provide protection from further injury.
2. In case of a serious accident of fatality, notify the Safety Department. The Safety Department will contact the insurance carrier, inform them of the accident, and request that they visit the site.
3. Complete Accident Investigation Report (Form #501-6/98). All serious accidents shall be photographed.
4. **In the event of a fatal accident, the work area shall be shut down immediately, and guard posted at the accident location so that nothing can be altered or removed. OSHA requires that they be notified in an event of a fatality or multiple accident involving 3 or more persons within 8 hours of the occurrence.**
5. Any **Hardage Construction** employee injured to the extent that medical treatment is required shall submit to a substance abuse test during the day of the accident. This also applies to company personnel involved in an accident in a company vehicle before, during or after work. (For more information see Substance Abuse Program, Section 2.2).

When there is a serious accident involving a Subcontractor's employee (a serious accident shall be determined by the Safety Department), a meeting shall be scheduled involving **Hardage Construction's** Project Manager, Project Superintendent, a representative of **Hardage Construction's** Safety Department and a Subcontractor's company officer.

5.5.1 Emergencies

During an emergency, the supervisor must:

Ensure that those under his or her supervision are familiar with the plan for the jobsite and/or building, particularly the recommended exit routes and how to report an emergency.

Render assistance to the person in charge during an emergency, as required.

Maintain familiarity with the shutdown procedures for all equipment used by those under his or her supervision.

Know the location and use of all safety equipment on his or her jobsite.

Keep employees from re-entering an evacuated area until reentry is safe.

5.5.2 No Loitering Policy:

Employees not involved in the emergency must stay away from the scene and follow the instructions issued over the public address system or directly from the person in charge. The sounding of a fire bell means immediate evacuation by the nearest exit. Employees must not reenter an area that they have evacuated until notified that it is safe to return.

5.5.3 Employee Responsibilities

Employees, other than emergency-response groups, involved in any emergency greater than a minor incident are expected to act as follows:

If there is threat of further injury or further exposure to hazardous material, remove all injured persons, if possible, and leave the immediate vicinity. If there is no threat of further injury or exposure, leave seriously injured personnel where they are.

Report the emergency immediately to the supervisor. State what happened, the specific location, whether anyone was injured, and your name and phone number.

Proceed with first aid or attempt to control the incident only if you can do so safely and have been trained in first aid or the emergency response necessary to control the incident.

Show the ranking emergency-response officer where the incident occurred, inform him or her of the hazards associated with the area, provide any other information that will help avoid injuries, and do as he or she requests.

All injuries, near misses, and illnesses will be evaluated for trends and similar causes. If a trend has developed, corrective actions shall be initiated.

Hardage Construction Corporation
ACCIDENT INVESTIGATION REPORT

Check type of report

Injury to Hardage Construction Personnel _____
Injury to Subcontractor /pedestrian/visitor _____
Property/equipment damage _____

Injured Person_____Age_____

Job or Dept._____Location_____

Date_____Time_____a.m./p.m.

Nature of injury/damage_____

Medical treatment required?_____

What happened?_____
_____
_____

Witnesses_____

Why did it happen?_____
_____
_____

What should have been done to prevent this accident?_____

What has been done so far?_____

Describe safety follow up plan_____
_____

Signature_____Title_____Date_____

Form #501/6/98)

6.0 OSHA COMPLIANCE INSPECTIONS

Hardage Construction Corporation's Field Personnel or Subcontractor *Are Not* Authorized Representative For OSHA Inspection. Inform The Compliance Officer Of This And Call The Office. Only In Cases Were Someone From The Safety Department Is Unable To Get To The Jobsite Will You Be Authorized To Act As The Company Representative During A OSHA Compliance Inspection.

6.1 Procedures

1. Call the office and speak with the Safety Department. We have the right to ask the inspector to wait until a representative of **Hardage Construction Corporation's** Safety Department arrives at the jobsite.

2. A qualified, properly equipped **Hardage Construction** representative shall accompany each compliance officer during the inspection.

3. Be professional and polite, treat the inspection as serious business, not an intrusion.

4. Review and record the credentials of all compliance inspection personnel.

5. Take detailed notes during the inspection.

6. Take additional samples and photographs of everything so documented by OSHA.

7. Be honest, but do not make voluntary statements to OSHA regarding site condition.

8. Do not agree with statements that place blame or responsibility for violations on **Hardage Construction** and/or any Subcontractor.

9. You are not required to demonstrate machines or equipment.

10. Do not interfere with the inspection process.

11. Abate unsafe conditions in a safe manner - - immediately if possible.

6.2 Consultation Inspections

At the request of the Project Manager, Project Superintendent, Safety Department, Project Owner, or any trade Subcontractor, the main office will arrange for an on-site inspection to be performed by a consultation officer of the Division of Occupational Safety and Health of the Industrial Commission of California, or the Safety Director of the A.G.C.

7.0 SITE SAFETY GUIDELINES

7.1 HOUSEKEEPING

Housekeeping is an important issue on our projects. A neat, clean, job reflects directly on workmanship of the employees and the contractor. Good housekeeping directly affects Safety, Quality, Production.

It is the responsibility of every worker on the job to keep their work area neat, clean and organized. Never rely on others to maintain your work area. Good housekeeping is especially critical in general access areas. Aisles, passageways, stairs, floor perimeters and entrances must be kept clear of debris/tripping hazards.

Loose materials should not be thrown off a floor or through an opening. Use trash chutes and skip boxes for moving loose materials, barricade off areas and post safety monitors.

Each Subcontractor will be responsible to control and remove any materials or debris created by work performed by its employees. Work areas shall be cleaned on a daily basis or as directed by the Project Superintendent. If Hardage Construction has to clean the area, the Subcontractor will be back charged for the work. A written directive must be given to subcontractor for any cleanup prior to Hardage Construction cleaning up work area; a copy of the directive must be given to the Project Manager for back charge documentation.

7.2 TRENCHING AND EXCAVATION

Subcontractors requirements for excavation that are 5 or more feet deep or are in unstable earth, and in which people will work must specify that shoring is required that is in compliance wish 29 CFR 1926, Sub part P, Excavation.

If it is necessary to deviate from the requirements, a civil engineer registered by the State must submit detailed data to **Hardage Construction** for alternative effective shoring and sloping systems. This data shall include soil evaluations, slope stability, slope protection and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used.

When sheet piling is to be used, full loading due to ground water table must be assumed unless prevented by weep holes and drains or other means. Additional stringers, uprights, and bracing must be provided to allow for any necessary temporary removal of individual supports. Excavated material must be located at lease 2 ft. back from the edge of excavations.

7.2.1 Competent Person

Excavation work must always be under the immediate supervision of someone with authority and qualifications to modify the shoring system or work methods as necessary to provide greater safety.

A competent person is defined as anyone capable of identifying existing and predictable hazards in the work environment and who has the authority to correct such hazards.

7.2.3 The following procedures are to be considered general guidelines for trenching and excavation work on any Hardage Construction Project.

1. Locate and identify all underground utilities on the project. This should be coordinated with local utility agencies and/or facility representative.
2. A soils report for the project should be reviewed prior to beginning any excavation.
3. For all work in excess of 10 feet in depth or in any Class C (water content) soils, the Subcontractor must submit a shoring safety plan to the Project Superintendent before starting.
4. Shoring equipment used for working in excess of 20 feet in depth will require stamped engineering data that verifies its adequacy for the depth of types of soils.
5. Any work that involves entry into live storm or sewer taps should be considered as a confined space. Hardage Construction "Confined Spaces Permit" form (Refer to Form #502-6/98).

filled out prior to this work process. Contractors should be utilized on the project in confined space entry.

6. When sloping of the ground is chosen in lieu of a shoring system, rule of thumb for a minimum slope be 1:1 from the toe of trench or excavation.
7. Employees must always access, egress and work within and access via the confines of the shoring system.
8. The competent person must perform a written daily inspection of excavations, the adjacent areas, and protective systems before the start of each work day and as necessary throughout the shift. If the subcontractor does not perform the inspections, then it will be up to the Project Superintendent to perform the inspection. (Refer to Daily Trench/Excavation Inspection Form #503-6/98).

DAILY TRENCHNG/EXCAVATION INSPECTION

Date_____Time_____Report #_____

Company Name_____
Project Name_____
Excavation Location_____

Site Evaluations

Depth_____**Width**_____**Length**_____

_____Surface encumbrances
_____Underground installation
_____Access and egress
_____Exposure to vehicular traffic
_____Exposure to falling loads
_____Hazardous atmospheres
_____% of Oxygen
_____Warning System for mobile equipment
_____Protection from water accumulation
_____Stability of adjacent structures
_____Employee protection – loose rock/soil
_____Inspections
_____Fall Protection
_____% of Lower Explosive Levels

Note: Where oxygen deficiency (atmospheres containing less that 19.5% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavation in landfill areas or where hazardous substances are stored nearby, the atmosphere in the excavation shall be tested before employees enter excavations greater than 4 feet in depth.

Soil Classifications

Soil classifications shall be made based on the results of at least one visual and one manual test.

_____Stable Rock _____Type A Soil _____Type B Soil _____Type C soil

Visual Tests

Inspect worksheet for:
_____Fissured ground
_____Layered soil
_____Previously disturbed earth
_____Seepage
_____Vibration
_____Pour drainage

Manual Tests

_____Plasticity
_____Dry strength
_____Thump penetration
_____Pocket penetrometer
_____Shearvane
_____Drying test

Protective Support Systems

Sloping and Benching

_____Stable rock 90 degrees
_____Type A – 53 degrees
_____Type B – 45 degrees
_____Type C – 34 degrees

Shoring and Shielding

_____Timber or hydraulic
_____Trench boxes, trench shields
_____Design using tabulated data
_____RPE

Additional Comments or
Information:_____

Inspection performed by:_____
Authorized Competent Person

Form #503-6/98

Table B-1

Maximum Allowable Slopes

Soil or Rock Type	Maximum Allowable Slopes (H:V) [1] For Excavations Less Than 20 Feet Deep[3]	
Stable Rock	Vertical	(90 degrees)
Type A[2]	3/4:1	(53 degrees)
Type B	1:1	(45 degrees)
Type C	1 1/2:1	(34 degrees)

NOTES:

[1] Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

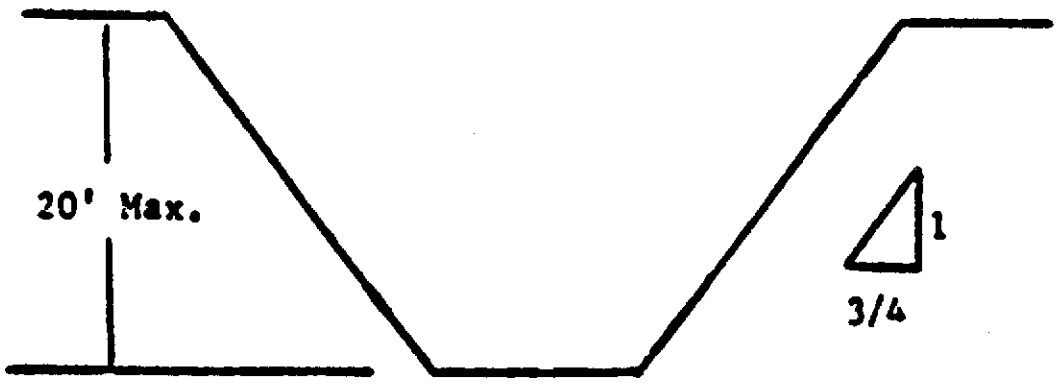
[2] A short-term maximum allowable slope of 1/2 H:1V(63 degrees) is allowed in excavation in Type A soil that are 12 feet(3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet(3.67m) in depth shall be 3/4H:1V(53 degrees).

[3] Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

(All slopes stated below are in the horizontal to vertical ratio)

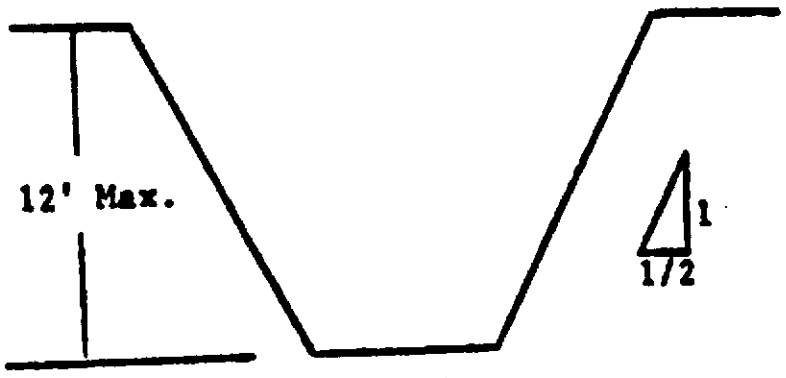
B-1.1 Excavations Made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



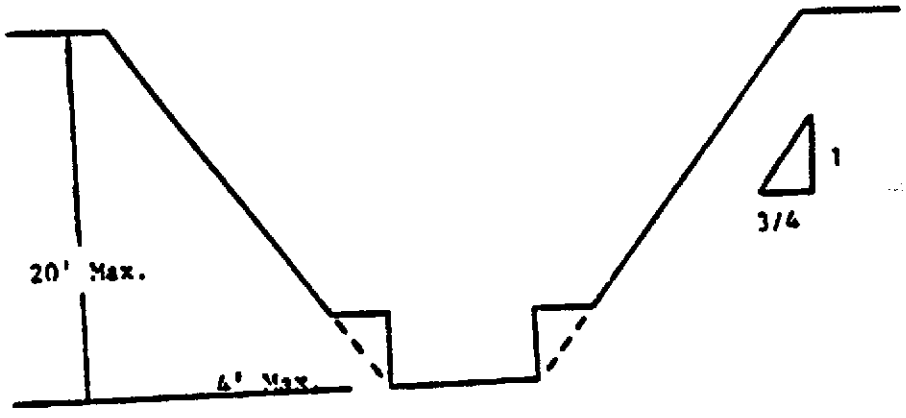
Simple Slope - General

Exception: Simple slope excavations which are open 24 hours or less(short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.

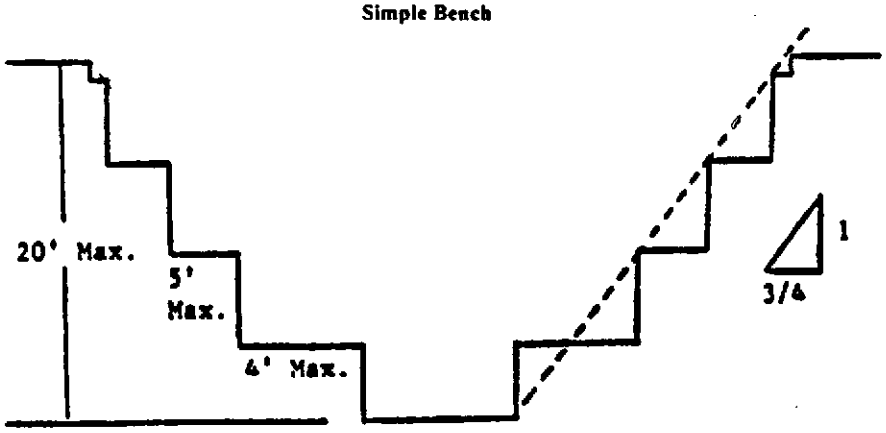


Simple Slope - Short Term

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

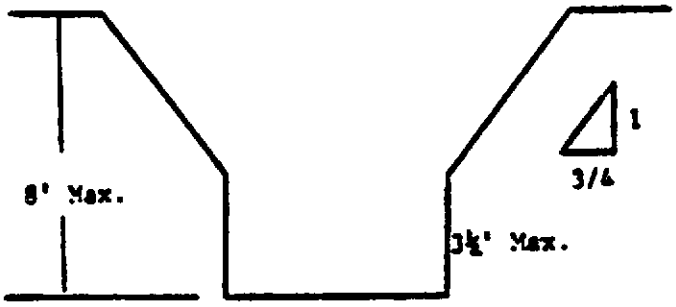


Simple Bench



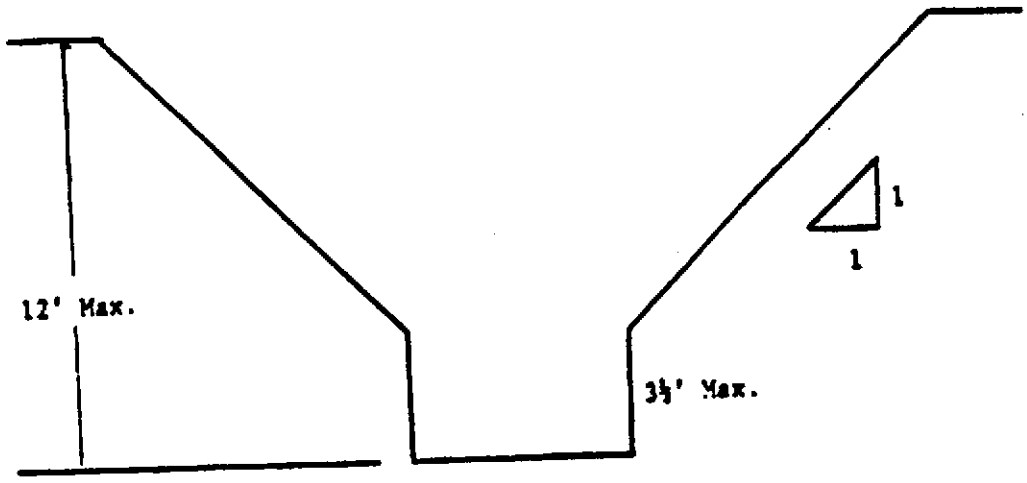
Multiple Bench

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



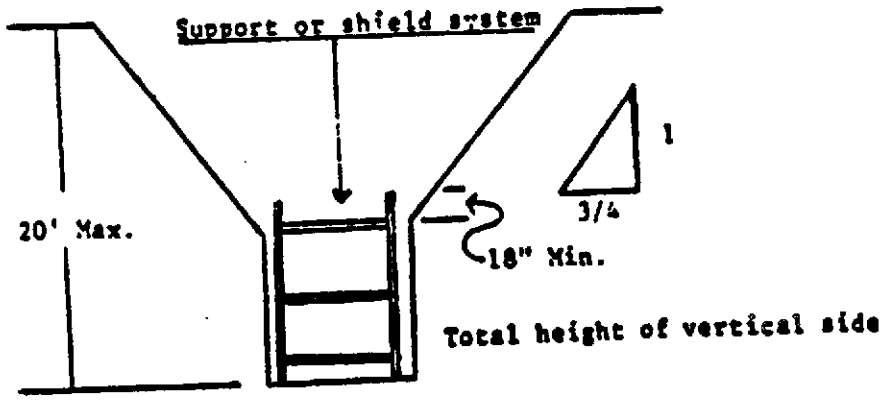
Unsupported Vertically Sided Lower Portion-Maximum 8 Feet in Depth

All excavations more than 8 feet but not more than 12 feet in depth which have unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.



Unsupported Vertically Sided Lower Portion-Maximum 12 Feet in Depth

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The supported or shield system must extend at least 18 inches above the top of the vertical side.

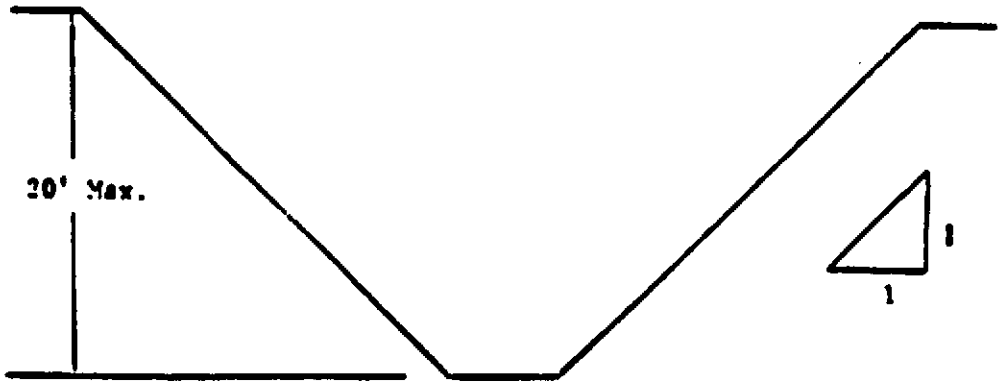


Supported or Shielded Vertically Sided Lower Portion

4. All other simple slope, compound slope, and vertical sided lower portion excavations shall be in accordance with the other options permitted under 1926.652(b).

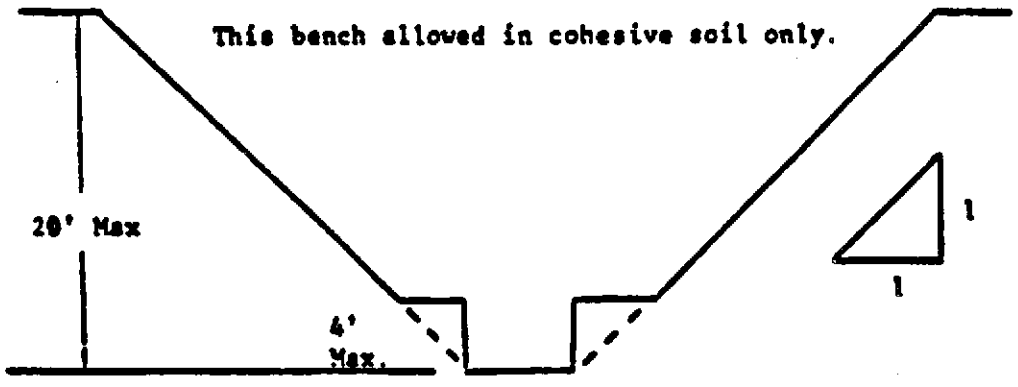
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

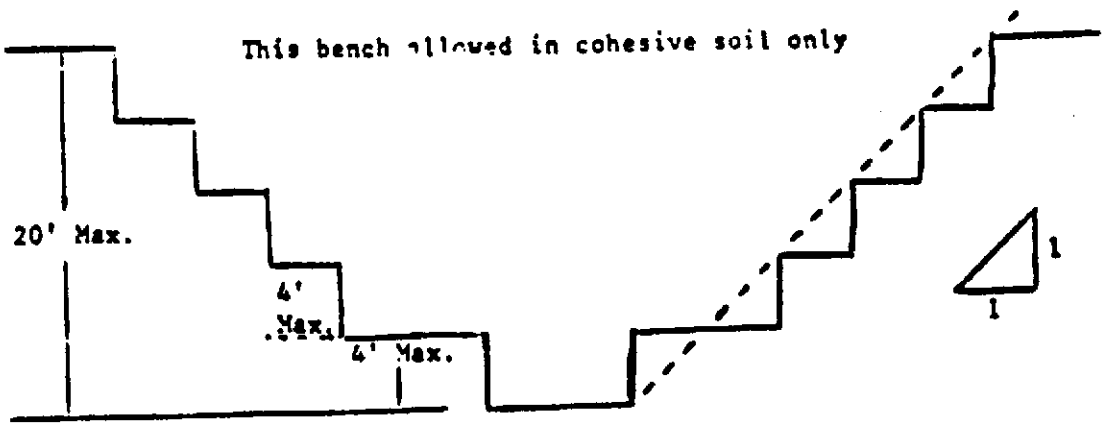


Simple Slope

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

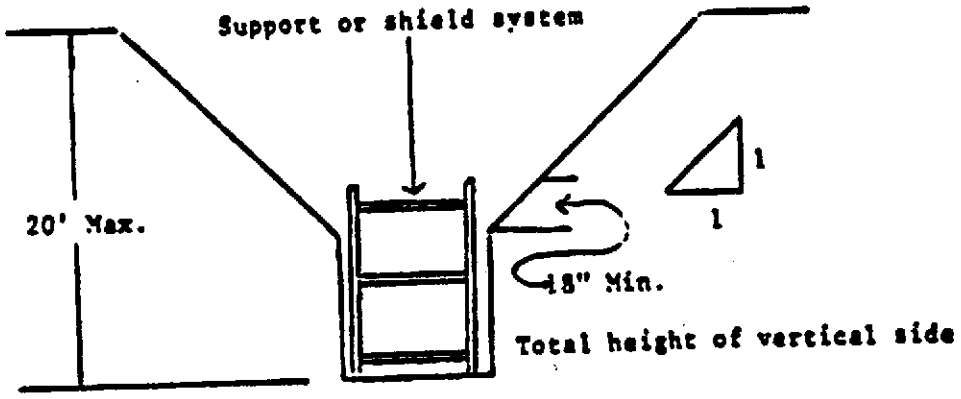


Simple Bench



Multiple Bench

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

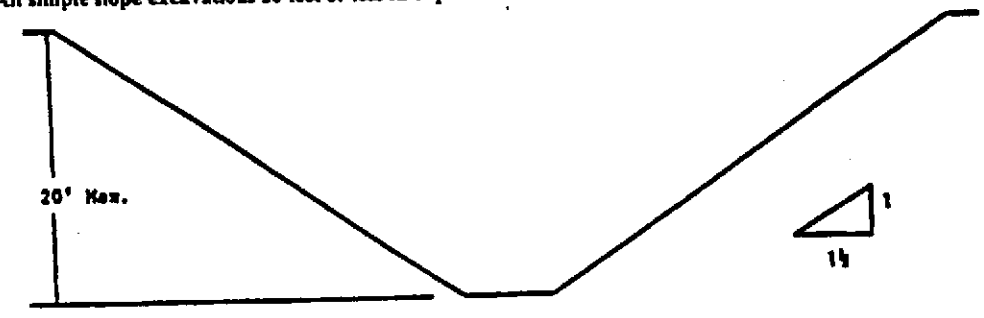


Vertically Sided Lower Portion

4. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

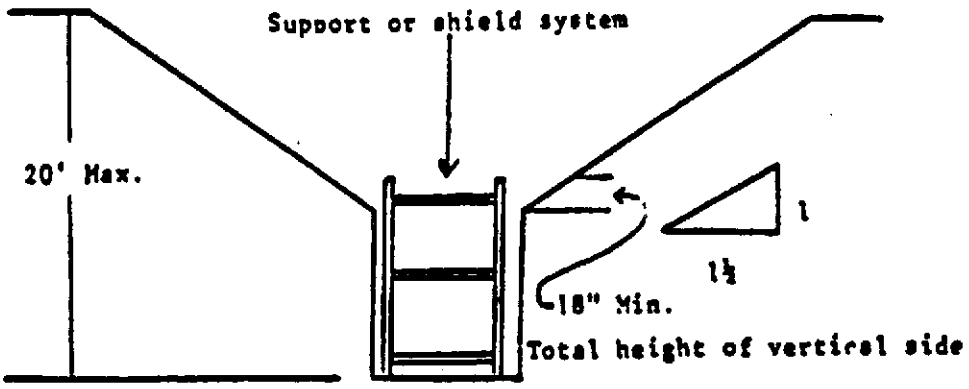
B-1.3 excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2 :1.



Simple Slope

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 1/2:1.

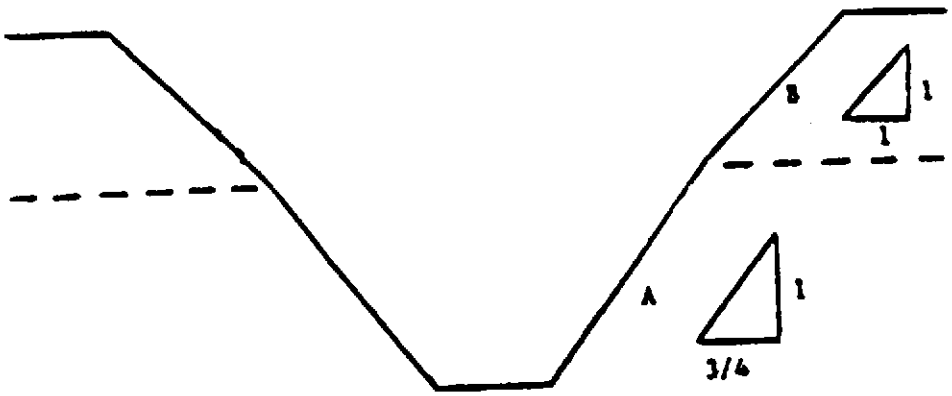


Vertical Sided Lower Portion

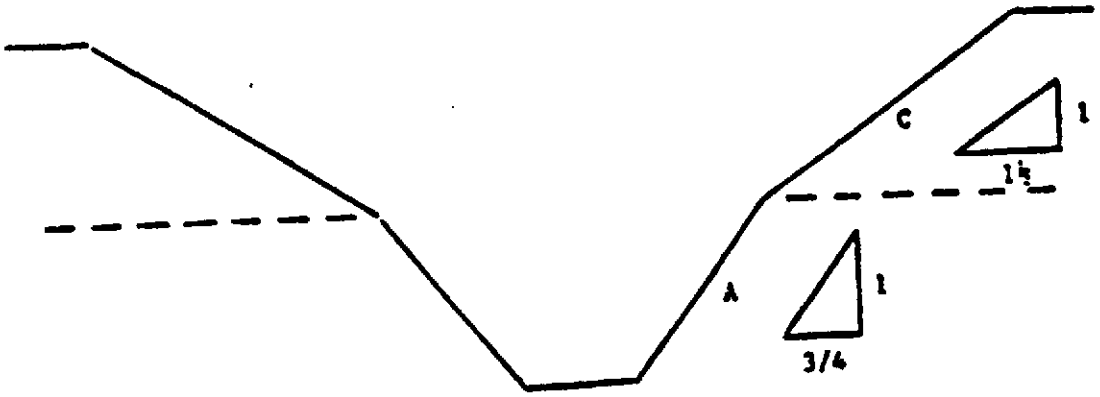
3. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

B-1.4 Excavations Made in Layered Soils

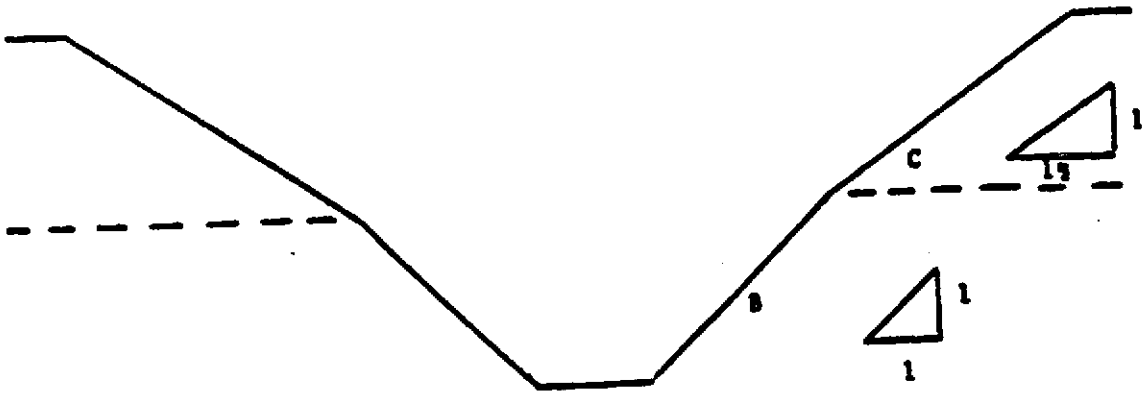
1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



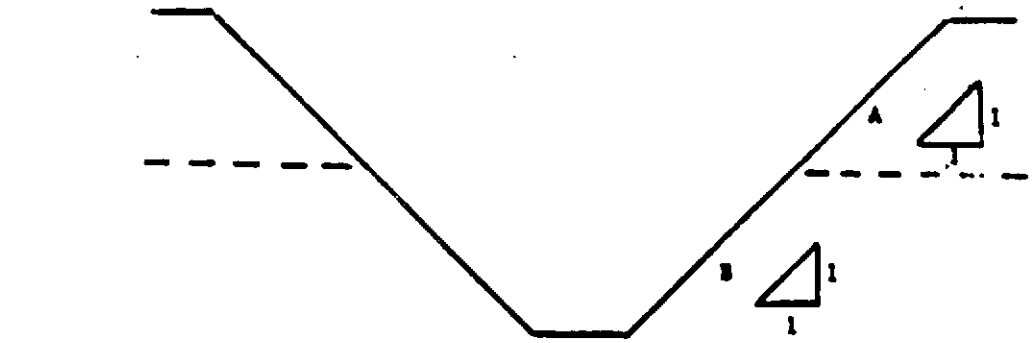
B OVER A



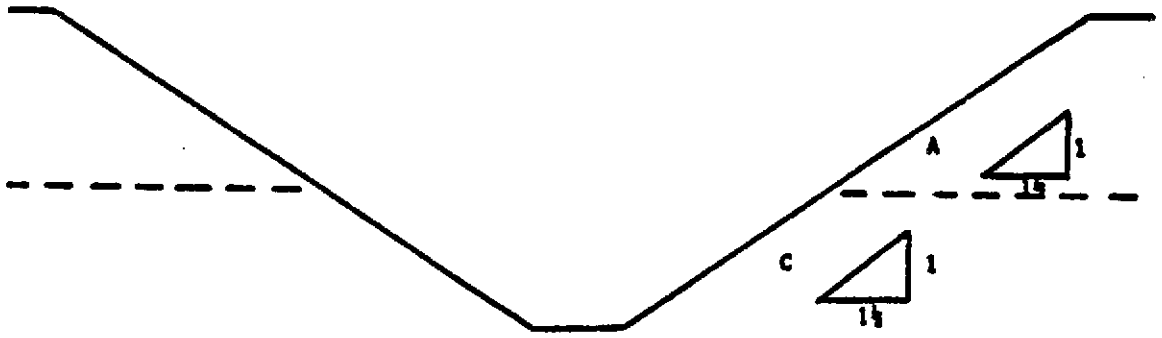
C OVER A



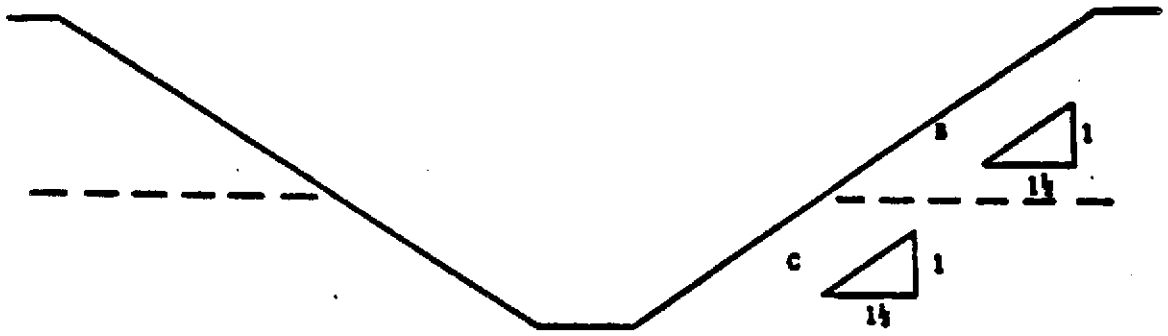
C OVER B



A OVER B



A OVER C



B OVER C

2. All other sloped excavations shall be in accordance with the other options permitted in 1926.652(b).

Table D - 1.1
Aluminum Hydraulic Shoring
Vertical Shores
For Soil Type A

DEPTH OF TRENCH (FEET)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
OVER 10 UP TO 15	8				
OVER 15 UP TO 20	7				
OVER 20	NOTE (1)				

Footnotes to tables and general notes on hydraulic shoring are found in OSHA, Appendix D, Item (g).

Note(1): See Appendix D, Item (g) (1).

Note(2): See Appendix D, Item (g) (2).

Table D - 1.2
Aluminum Hydraulic Shoring
Vertical Shores
For Soil Type B

DEPTH OF TRENCH (FEET)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
OVER 10 UP TO 15	6.5				
OVER 15 UP TO 20	5.5				
OVER 20	NOTE (1)				

Footnotes to tables and general notes on hydraulic shoring are found in OSHA, Appendix D, Item (g).

Note(1): **See Appendix D, Item (g) (1).**

Note(2): **See Appendix D, Item (g) (2).**

Table D - 1.3
Aluminum Hydraulic Shoring
Vertical Shores
For Soil Type B

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS MAX.HORIZ.SPACING (ON CENTER)		
			WIDTH OF TRENCH (FEET)								
	VERTICAL SPACING (FEET)	* SECTION MODULUS (IN^3)	UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15		SOLID SHEET	2 FT.	3 FT.
			HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10	4	3.5	8.0	2 IN	8.0	2 IN NOTE(2)	8.0	3 IN	—	—	3x12
		7.0	9.0	2 IN	9.0	2 IN NOTE(2)	9.0	3 IN			
		14.0	12.0	3 IN	12.0	3 IN	12.0	3 IN			
OVER 10 UP TO 15	4	3.5	6.0	2 IN	6.0	2 IN NOTE(2)	6.0	3 IN	—	3x12	—
		7.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 15 UP TO 20	4	3.5	5.5	2 IN	5.5	2 IN NOTE(2)	5.5	3 IN	3x12	—	—
		7.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
		14.0	9.0	3 IN	9.0	3 IN	9.0	3 IN			
OVER 20	NOTE (1)										

Footnotes to tables and general notes on hydraulic shoring are found in OSHA, Appendix D, Item (g).

Note(1): See Appendix D, Item (g) (1).

Note(2): See Appendix D, Item (g) (2).

*** Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.**

Table D - 1.4
Aluminum Hydraulic Shoring
Vertical Shores
For Soil Type C

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
			WIDTH OF TRENCH (FEET)						MAX.HORIZ SPACING (ON CENTER)		
			UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15				
	VERTICAL SPACING (FEET)	SECTION MODULUS* (IN^3)	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	SOLID SHEET	2 FT.	3 FT.
OVER 5 UP TO 10	4	3.5	6.0	2 IN	6.0	2 IN NOTE(2)	6.0	3 IN	3x12	—	—
		7.0	6.5	2 IN	6.5	2 IN NOTE(2)	6.5	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 10 UP TO 15	4	3.5	4.0	2 IN	4.0	2 IN NOTE(2)	4.0	3 IN	3x12	—	—
		7.0	5.5	3 IN	5.5	3 IN	5.5	3 IN			
		14.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
OVER 15 UP TO 20	4	3.5	3.5	2 IN	3.5	2 IN NOTE(2)	3.5	3 IN	3x12	—	—
		7.0	5.0	3 IN	5.0	3 IN	5.0	3 IN			
		14.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
OVER 20	NOTE (1)										

Footnotes to tables and general notes on hydraulic shoring, are found in OSHA, Appendix D, Item (g).

Note(1): See Appendix D, Item (g) (1).

Note(2): See Appendix D, Item (g) (2).

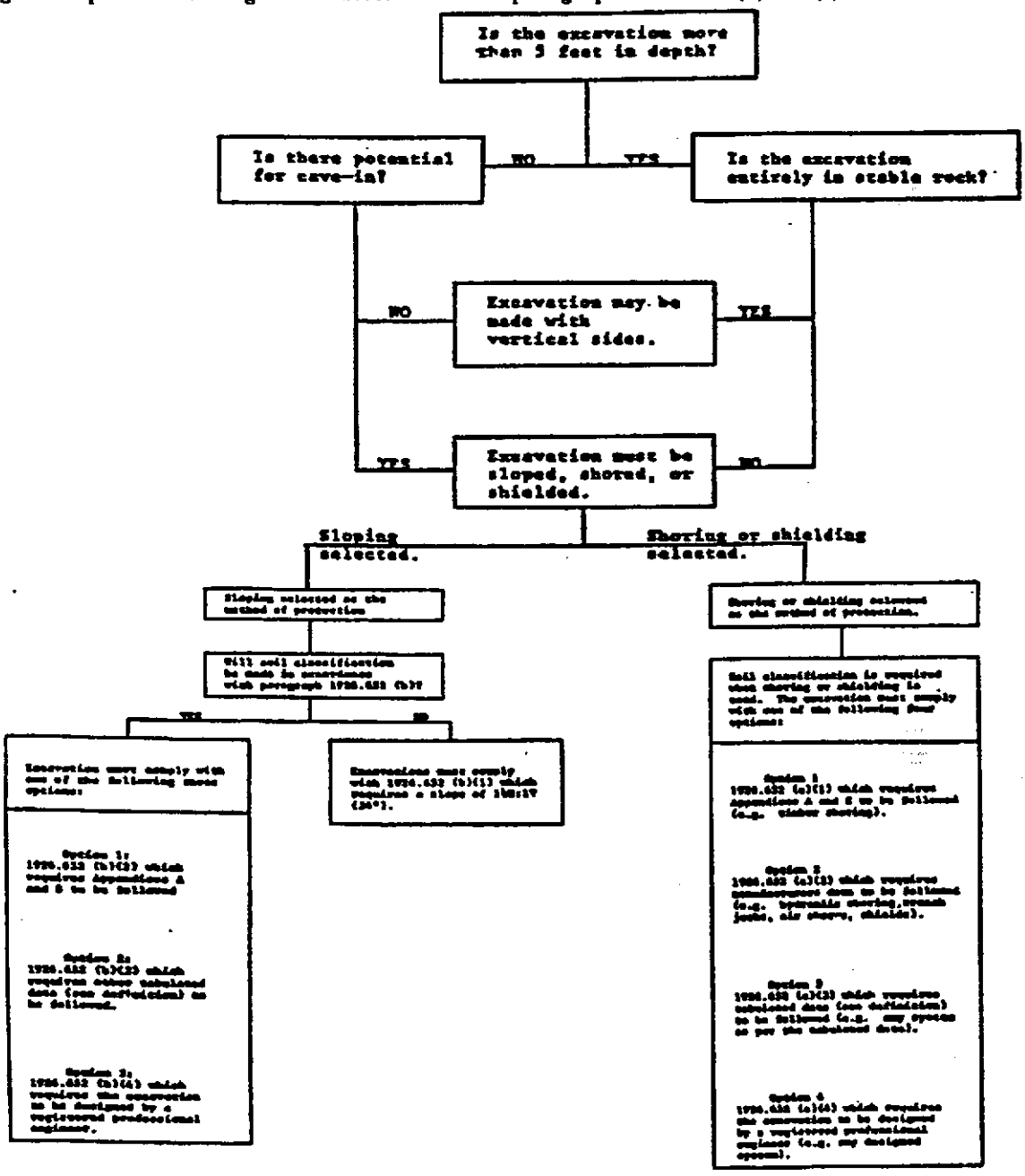
*** Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.**

APPENDIX F

Selection of Protective Systems

Figure 1 - Preliminary Decisions

The following figures are a graphic summary of the requirements contained in Subpart P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with paragraphs 1926.652 (b) and (c).



7.3 BLASTING OPERATIONS

7.3.1 Use of Explosives

All use of explosives shall conform to OSHA, MSHA, ANSI, DOT, NFPA, and any other applicable Federal, State and local laws.

While explosives are being handled or used, smoking, matches, or any other source of fire or flame shall not be allowed within 100 feet of the blast site.

No person shall be allowed to handle explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.

Original containers or day box magazines shall be used for taking detonators and other explosives from storage magazines to the blast site. When blasting is done in congested areas or in close proximity to a structure, railway, highway, or any other installation that may be damaged, the blast shall be covered before firing with a mat or material that is capable of preventing fragments from being thrown.

Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, warning signals, flags and barricades or woven wire mats to insure the safety of the general public and workers. Blasting operations shall be conducted during daylight hours whenever possible.

Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph, and steam utilities, the user (blaster) shall notify the appropriate representatives of such utilities at least twenty-four hours in advance of blasting specifying the location and intended time of such blasting. Verbal notice shall be confirmed with written notice.

Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity. These precautions shall include the suspension of all blasting operations and removal of persons from the blast site during the approach and progress of an electric storm, and the posting of signs warning against the use of mobile radio transmitters on all roads shall be in accordance with the applicable provisions of the American National Standards Institute D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways, as amended by Washington State Department of Highways Manual M24-01, (February 22, 1972) ensuring that mobile radio transmitters which are less than 100 feet away from electric blasting caps, when the caps are in other than original containers, shall be de-energized and effectively locked. Compliance with the recommendations of The Institute of the Makers of Explosives (IME) with regard to blasting in the vicinity of radio transmitters as stipulated in Radio Frequency Energy--A Potential Hazard in the Use of Electric Blasting Caps, IME Publication No. 20, September 1971, is mandatory.

7.3.2 Blasting Enclosures and Venting

Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located on sides away from any occupied area, to provide for pressure relief in case of explosion, following the principles set forth in the National Fire Protection Association Explosion Venting Guide, NFPA 68-1954.

7.4 CONFINED SPACES ENTRY PROGRAM

Confined space program shall conform to OSHA Regulation 1926.21, 1910.146 and any other applicable standard.

The purpose of this program is to ensure safe practice and procedure to protect employees from hazards of entry into and work within confined spaces.

7.4.1 Definitions

Confined space - enclosed space which is large enough to enter, has a limited or restricted entry/exit, is not designed for continuous human occupancy, and has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere;
2. Has an engulfment potential;
3. Has a configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a down sloping floor; and
4. Contains any other recognized serious safety or health hazards.

Confined spaces include, but are not limited to, trenching and excavation, tunneling, coffer dams, underpinning, caissons, etc, and any open top spaces more than 4 feet deep.

Confined space entry - when any part of the worker's face breaks the plane of any opening of the confined spaces.

Engulfment - surrounding and effective capture of a person by particular matter or a liquid.

Oxygen deficiency - an atmosphere containing oxygen at a concentration of less than 19.5 percent by volume.

Oxygen enrichment - an atmosphere containing oxygen at a concentration greater than 22 percent by volume.

Confined space attendant - an individual stationed outside one or more permit spaces who monitors the authorized entrants, and who performs all attendant's duties assigned.

7.4.2 Training requirements

Workers who will be required to enter confined space, and attendants who will be required to monitor the operation shall be trained in the hazards that may be encountered in operations and rescue procedures. Such training shall be conducted before each confined space operation.

Employees working as attendants shall receive the appropriate training and perform the following assigned duties:

1. Knowledge of potential hazards and can recognize potential permit space hazards;
2. Continuously maintain an accurate count of all people in the space;

3. Monitor activities inside and outside the permit space to determine if it is safe for entrants to remain in space; and
4. Maintain effective and continuous contact with authorized entrants during entry.

7.4.3 Procedures

1. Entry Permit

A written permit system must be completed before allowing a worker to enter a confined space. (Refer to Confined Spaces/Checklist Form #502-6/98). The permit must be completed by the Project Superintendent for Hardage Construction Corporation employees, the Subcontractor's competent person shall fill out the permit and submit a copy to the Project Superintendent before confined space entry begins.

The written permit must contain the following minimum specific information of each permit entry space:

A. Date of entry.
B. Location of confined space
C. Time of issue
D. Time permit expiration
E. Names of workers assigned to enter
F. Name and position of person authorizing or in charge of entry
G. Description of the hazards known or reasonably expected to be present in the confined space
H. The atmospheric testing required to be done immediately before and during the entry period and the designated person responsible for performing the tests.
I. The personal protective equipment required, including respiratory protection, cloth or harnesses required for entry and rescue.
J. Description of any additional hazards that may be reasonably expected to be generated by the entrants activities in the space.
K. Identification of all special work practices or procedures to be followed.
L. Specification of all means of isolation, cleaning, purging, ventilation or inerting to be done before entry to remove or control hazards, and certification that these procedures have been completed.

2. **Termination of entry permit.**

Workers should be removed from the confined space if:

A. There is a change in atmosphere.

B. There is ventilation failure.

C. The attendant is called away from the confined space.

D. Pre-entry permit time expires.

E. The supervisor feels conditions are unsafe.

7.4.4 Hazardous locations

Hazardous locations differ from confined spaces in that they are not generally enclosed. Many of the same problems/exposures still exist. A location may be deemed hazardous because of high chemical concentrations or dangerous processes. Protection of employees at hazardous locations shall be consistent with the procedures in confined spaces.

CONFINED SPACES PERMIT/CHECK LIST

Date of entry_____Location_____

_____

Time issued_____Expiration Date_____

Employees assigned to enter_____

_____

_____

Person in charge_____Position_____

(competent person)

Description of known hazards present in confined space:_____

	Required		Complete	
	Yes	No	Yes	No
Atmospheric test before and during				
1. Oxygen (19.5% to 23%)	___	___	___	___
2. Hydrogen sulfide gas (below 20 ppm)	___	___	___	___
3. Explosive gasses (less than 10% lel)	___	___	___	___

Designated person performing testing Protective equipment for entry and rescue	Required Yes	 No	Complete Yes	 No
1. Harness and lifeline on person entering and tied-off or secured.	___	___	___	___
2. Worker wearing monitor.	___	___	___	___
3. Worker wearing proper respiratory protection.	___	___	___	___
4. SCBA (5 min. or more) with worker.	___	___	___	___
5. Spare harness and lifeline with observer.	___	___	___	___
6. Spare SCBA (15 min. or more) with observer.	___	___	___	___
7. Ventilation equipment	___	___	___	___

Description of any additional hazards that may be expected to be generated by the entrance activities in the space and action taken to correct

conditions:_____

_____

_____

Special work practices to be followed:

1. Communication signals reviewed.
2. Emergency procedures understood.

Ventilation before and during.

Personnel involved in this entry have received instructions on safety procedures and hazards of this job and the permit is complete.

Signature of person in charge Title

_____

(competent person)

Signatures of person (s) assigned to

enter_____

_____

Form #502-6/98)

7.5 MATERIAL HANDLING

7.5.1 Introduction

Hardage Construction requires that safety planning and practices for commonplace tasks be as thorough as for operation with unusual hazards. Commonplace tasks make up the greater part of the daily activities of most employees and, not unexpectedly, offer more potential sources of accidents with injuries and property damage. Every operation or work assignment begins and ends with the handling of materials. Accident risks can be reduced with thorough planning. Identifying obvious and hidden hazards shall be the first step in planning work methods and job practices. Thorough planning shall include all the steps associated with good management from job conception through crew and equipment decommissioning.

The **Project Superintendent** must be notified whenever it is appropriate to use a crane, forklift truck, or other motorized handling or lifting equipment.

7.5.2 Lifting and Moving

Lifting and moving of objects must be done by mechanical devices rather than by manual effort whenever practical. The equipment used must be appropriate for the lifting or moving task. Lifting and moving devices must be operated only by personnel trained and authorized to operate them. Employees shall not lift heavy or bulky objects that overtax their physical condition or capability.

7.5.3. Clean Work Areas

All areas controlled by **Hardage Construction** must be kept in orderly and clean condition and used only for activities or operations for which they have been approved.

Every work location must be provided with illumination that meets OSHA requirements. Evaluation of illumination quality and requirements is made by the Project Superintendent.

7.5.4 Transporting Employees and Materials

When employees are transporting either employees or materials, they must have an operator's license for that classification of vehicle and be certified or trained in the operation of that vehicle. They must also have knowledge of Basic First Aid and safety equipment as well as an understanding of how the vehicle operates.

Employees transported by truck shall ride in the cab with seat belts in place. The only exception is that employees may ride in the truck bed on site only, where the vehicle speed is limited to 14 MPH and provisions provided to prevent their falling from the vehicle.

7.5.5 Material Handling Equipment Inspections

Each mechanical lifting or moving device must be inspected periodically. Each lifting device must also be inspected before lifting a load near its rated capacity. Defective equipment must be repaired before it is used. The rated load capacity of lifting equipment must not be exceeded.

Material moving equipment must be driven forward going up a ramp and driven backward going down a ramp.

Traffic must not be allowed to pass under a raised load.

The floor-loading limit must be checked before mobile lifting equipment enters an area.

Passengers must not be carried on lifting equipment unless it is specifically equipped to carry passengers.

7.5.6 Load Path Safety

Loads moved with any material handling equipment must not pass over any personnel. The load path must be selected and controlled to eliminate the possibility of injury to employees should the material handling equipment fail. Transported equipment which is worked on while supported by material handling equipment must have a redundant supporting system capable of supporting all loads that would be encountered in the event of failure of the material handling equipment. A suspended load must never be left unattended. It must be lowered to the working surface and the material handling equipment secured before leaving the work area.

7.5.7 Truck Loading

All objects loaded on trucks must be secured to the truck to prevent any shifting of the load in transit. The wheels of trucks being loaded or unloaded at a loading dock must be chocked to prevent movement.

7.5.8 Forklifts

Only trained personnel shall be allowed to operate forklifts. Lift Truck Operating rules must be posted and will be strictly enforced.

Operators of forklifts are required to wear provided seat belts on forklifts that have roll over protection systems.

When operating any forklift, substantial overhead protective equipment will be provided on high lift rider equipment. Directional lighting is also provided on each forklift that operates in an area with less than 2 foot candles per square foot of general lighting.

Each forklift must have a warning horn, whistle, gong or other device which can be clearly heard above the normal noise in the area where operated. Before using a forklift, check that the brakes on each forklift are capable of bringing the vehicle to a complete and safe stop when fully loaded.

The parking brake must effectively prevent the vehicle from moving when unattended. When motorized hand and hand/rider trucks are operated, and when the operator releases the steering mechanism, make sure that both the brakes are applied and power to the motor is shut off.

When an forklift operates in areas where flammable gases, vapors, combustible dust, or ignitable fibers may be present in the atmosphere, the vehicle must be approved for such locations with a tag showing such approval posted on the vehicle itself.

Forklifts with internal combustion engines, operated in buildings or enclosed areas, shall be carefully checked to ensure that the operation of the vehicle does not cause harmful concentration of dangerous gases or fumes. (Refer to the Confined Spaces section for further information).

7.5.9 Forklift Operators

Forklift operators must familiarize themselves with and comply with **OSHA Standard 29 CFR 1926.600 and ANSI B56.1.**

7.5.10 Modifications

Modifications and additions must not be performed by the customer or operator without manufacturer's prior authorization or qualified engineering analysis. Where such authorization is granted, capacity, operation and maintenance instruction plates, tags, or decals must be changed accordingly.

If the forklift is equipped with front end attachments other than factory installed attachments, the user must ensure that the forklift is marked with a card or plate that identifies the current attachments, shows the approximate weight of the forklift with current attachments and shows the lifting capacity of the forklift with current attachments at maximum lift elevation with load laterally centered.

The operator must see that all nameplates and caution and instruction markings are in place and legible.

The operator must consider that changes in load dimension may affect forklift capacities.

7.5.11 Forklift Maintenance

Because forklift may become hazardous if maintenance is neglected or incomplete, procedures for maintenance must comply with ANSI B56.1 Section 7 and OSHA Standard 29 CFR 1926.600.

7.5.12 Forklift Extensions

Maximum efficiency, reliability, and safety require that the use of fork extensions be guided by principles of proper application, design, fabrication, use, inspection, and maintenance. The user must notify the **Project Superintendent** before purchasing extensions or having them fabricated.

Fork extensions are only appropriate for occasional use. When longer forks are needed on a regular basis, the truck shall be equipped with standard forks of a longer length.

Routine on-the-job inspections of the fork extension must be made by the fork lift operator before each use. Extensions must be inspected for evidence of bending, overload, excess corrosion, cracks, and any other deterioration likely to affect their safe use.

All fork extensions must be proof load tested to establish or verify their rated capacities, whether they were supplied commercially or fabricated. A load equal to the rated capacity of the pair at a particular load center multiplied by 1.15, must be placed on each fork extension pair and fork assembly and supported for a period of five minutes without any significant deformation. Rated capacity must be determined at significant load centers including the midpoint of the extension and at the tip. Once

determined, the rated capacity and load center information must be shown by stamping or tagging the extensions in a protected location of low stress. The proof load test must be witnessed by a mechanical engineer or designer.

Whenever evidence of deterioration is detected or whenever the extensions have been overloaded, magnetic particle inspection must be performed.

7.5.13 Cranes and Rigging

7.5.13.1 Definitions

Bridge cranes are classified as cab-operated or pendant-operated. Mobile cranes consist of a boom and controls mounted on a truck chassis.

7.5.14 Operator Requirements

Bridge and mobile cranes must be operated only by trained operators. The supervisor is also responsible for ensuring that operators are trained, carrying out the daily inspections and following the safe operating rules. (Refer to Form #306 - 8/95).

Extreme caution shall be taken by all crane operators when moving crane boom in the presence of energized electrical lines.

7.5.15 Crane Inspections Required

Routine maintenance, adjustments, and repairs must be performed by a qualified mechanic according to each machine's established schedule and according to OSHA requirements.

Cranes shall be inspected on an annual basis. The inspection certificate shall be on-site. The crane must be utilized in an operation which does not violate OSHA regulations. Cranes will be visually inspected for defective components prior to any work shift. Electrically operated cranes will be effectively grounded, preventive maintenance established, have a clearly visible load, operating controls clearly identified, a fire extinguisher provided at the operator's station, rated capacity visibly marked, an audible warning device mounted on the crane, and sufficient illumination. Crane design shall be such that the boom will not fall over backwards when equipped with boom stops.

7.5.15.1 Hooks

On days used, visual inspection by a crane operator is required. Annual inspections must have signed reports by an outside Engineer. Hooks with cracks or having deformation more than 15% in excess of normal throat opening or more than 10 degrees twist from the plane of the unbent hook must be discarded. Wire rope slings, including end connections, for excessive wear, broken wires, stretch, kinking or twisting.

7.5.16 Rigging and Loads

Planning for safe rigging and lifting must begin at the design stage of the product being lifted, and lifting procedures must be developed for assembly and installation. The lifting procedure shall be developed and discussed with the rigging crew foreman.

Responsibility for all rigging jobs is shared between the rigging foreman and the operator. The operator is responsible for defining and requesting the move, for providing technical information on relevant characteristics of the apparatus, including special lifting fixtures when required, for providing suggestions on rigging and moving, and for assigning someone to represent them both in planning and while the job is being carried out. The riggers are responsible for final rigging and for carrying out whatever moves have been designated. Before any movement takes place, however, the rigging crew and the operator must approve the rigging and other procedures associated with the intended move. Each must respect the responsibility and authority of the other to prevent or terminate any action perceived to be unsafe or otherwise improper.

The supervisor must make certain that all personnel involved in the operation are knowledgeable in moving objects safely by hand or with material handling equipment in the operations normal to the area, and must permit only those employees who are formally qualified by training and certification to operate a forklift, crane, or hoist. The supervisor must enforce the use of safe lifting techniques, and maintain lifting equipment in good mechanical condition.

When equipment is designed to be crane lifted at a single point with a single-bolt pickup device, the vertical lifting load through the screw thread of the bolt must be in line with the axis of the bolt so that the load will remain level when it is lifted. With this bolt alignment, the lift will be through the center of gravity and will be safer since the load will not tilt or kick out when it is lifted. A single-bolt pickup device, such as a Safety Hoist Ring or equivalent carefully designed and maintained in-house device, must be used.

When a load is to be crane-lifted by slings from a crane hook through 2, 3, or 4 single-load pickup points located at the corners of the load, and without the use of a spreader bar, the forces at the lift points will be non-vertical. In this case a single bolt pickup device, such as a safety hoist ring or equivalent carefully designed and maintained in-house device, must be used at each pickup point.

The use of eye bolts with shallers is permitted for lifting light incidental loads after receiving approval from the crane certified operator or supervisor and when the following conditions are met:

The load is in line with the axis of the eye bolt and side loads are minimal (a spreader bar may be required).

The average stress at the root area of the thread does not exceed 5000 psi.

The thread engagement is at least two bolt diameters.

Employees are required to observe all established safety regulations relating to safe lifting techniques.

7.5.17 Crane Running Ropes Inspections

Running ropes must be thoroughly inspected at least once a year during the structural inspection of the crane, and a full, written, dated, and signed report of rope conditions must be kept on file.

CRANE SAFETY
OPERATING PROCEDURES

1. **Daily Inspection of Crane by Operator**

2. **Site Evaluation:**

   Power Lines Near the Crane

   Ground Conditions

   Weather Conditions

3. **Determine Load Weight**

   Load Weight =_____

   Block =_____

   Rigging =_____

   Total Weight =_____

4. **Determine Radius**_____

5. **Refer to Load Chart**

6. **Position Crane:**

   Minimum Radius_____

   Maximum Boom Angle_____

   Set outriggers

7. **Check for Adequate Rigging:**

   Center of Gravity_____

   Sling Capacity_____

8. **Review Signals/Pre-lift meeting**

9. **Hard Hats Use.**
   No Loads over Personnel

Form #306 - 8/95

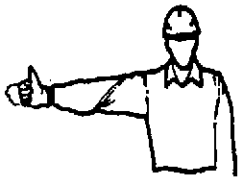
RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS

The following are the most commonly-used hand signals for directing boom equipment operations. Many special operations, such as pile-driving or very close work, may require adaptation of these basic hand signals. Changes should be agreed upon in advance by both the person signaling and the equipment operator.

Use Main Hoist Tap fist on head, then use regular signals.

Use Whip Line (auxiliary hoist) Tap elbow with one hand, then use regular signals.

Dog Everything Clasp hands in front of body.

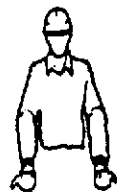


Raise Boom and Lower Load With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

Lower Boom and Raise Load With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

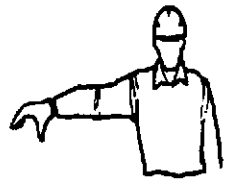
Travel (both tracks, crawler cranes only) Use both fists in front of body, making a circular motion about each other to indicate the direction of travel—forward or backward.

Bridge Travel Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.

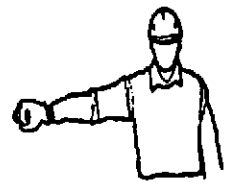


Extend Boom (telescoping booms) Both fists in front of body with thumbs pointing outward.

Retract Boom (telescoping booms) Both fists in front of body with thumbs pointing toward each other.



Open Clamshell Bucket Arm extended, open hand slowly.



Close Clamshell Bucket Arm extended, close hand slowly.

Trolley Travel Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.

Multiple Trolleys Hold up one finger for block marked "1," and two fingers for block marked "2." Regular signals follow.

Stop Arm extended down, wrist bent with palm down and open.

Emergency Stop Arm extended down, palm down and open, swing hand back and forth.

FIRE SAFETY

7.6.1 Introduction

Protection of and planning for fire safety at **Hardage Construction** takes into account the special fire hazards for specific operating areas, the protection of the employees and property. These ends are met by ensuring that:

1. Non-combustible or fire-rated materials and construction practices are suitable for assigned uses of building and facilities.

2. Alarm systems and automatic extinguishing systems are in place.

3. Availability of suitable hand extinguishers and local hose lines for use before firefighters arrive.

4. Access to professional fire department, staffed and trained in the control of emergencies that could occur at the site is available (The Fire Department makes the initial response to all requests for emergency aid received on the emergency telephone number, **911**.) This section covers the fire safety responsibilities of employees and supervisors, and sets forth the fire safety rules and procedures.

7.6.2 Fire Department

The Fire Department is responsible for protecting people and property from fires, explosions, and other hazards through prevention and control of such events. In addition, the Fire Department provides first-response rescue and transportation services in medical emergencies.

All fire protection and response functions are to be performed in conformance with OSHA regulations, State law, **Hardage Construction** policies, and nationally recognized standards and guidelines for fire and life safety. The Fire Chief and the Fire Marshall have the authority to enforce applicable requirements of the Uniform Building Code; the Uniform Fire Code; National Fire Protection Association Codes (including the Life Safety Code), Standards, and Recommended Practices; and the fire protection provisions of OSHA orders.

7.6.3 Fire Procedures

All employees must immediately report fires, smoke, or potential fire hazards to the Fire Department (dial 911).

All employees must conduct their operations in such a way as to minimize the possibility of fire. This includes keeping combustibles separated from ignition sources, being careful about smoking, and avoiding needless accumulations of combustible materials.

The Fire Department will provide guidance and construction criteria with respect to fire and life safety as well as inspections.

7.6.4 Supervisor Responsibilities

Each supervisor is responsible for notifying **Project Superintendent** of operations that change the degree of fire risk and will, therefore, require a change in the planned fire protection provisions. Before any hot work is started in the vicinity of flammable /combustibles, the Foreman responsible shall obtain and complete a **HOT WORK PERMIT** Form #505-6/98 from the Project Superintendent.

Supervisors must ensure that their personnel are properly instructed regarding potential fire hazards involved in their work and around their workplaces, the proper precautions to minimize fires, and the procedures in case of fire. The local Fire Department offers formal courses and training materials on fire prevention and response:

1. Fire Safety;
2. Fire-Extinguisher Operation;
3. Self-contained Breathing Apparatus.

7.6.5 Class A Combustibles/Fire Procedures

Class A combustibles are common materials such a wood, paper, cloth, rubber, plastics, etc. Fires in any of these fuels can be extinguished with water as well as other agents specified for Class A fires. They are the most common fuels to be found in non-specialized operating areas of the work place such as offices.

Procedures:

Dispose of waste daily.

Keep work area clean and free of fuel paths which can spread a fire once started.

Keep combustibles away from accidental ignition sources such as hot plates, soldering irons, or other heat or spark-producing devices.

Keep all rubbish, trash, or other waste in metal or metal-lined receptacles with tight-fitting covers when in or adjacent to buildings. (Exception: wastebaskets of metal or of other material and design approved for such use, which are emptied each day, need not be covered).

Use safe ash trays for disposal of smoking materials and ensure that the contents are extinguished and cold to the touch before emptying them into a safe receptacle.

Plan and use the combustibles in all operations so that excessive amounts are not stockpiled.

Store paper stock in metal cabinets, and rags in metal bins with automatically closing lids.

Make daily inspections and check for compliance of all fire safety rules.

7.6.6 Class B Combustibles/Fire Procedures

Class B Combustibles are flammable and combustible liquids (including oils, greases, tars, oil-base paints, lacquers) and flammable gases, including flammable aerosols (spray cans).

WARNING: The use of water to extinguish Class B fires (by other than trained firefighters) can cause the burning liquid to spread carrying the fire with it.

Flammable-liquid fires are usually best extinguished by excluding the air around the burning liquid. Generally this is accomplished by using one of several approved types of fire-extinguishing agents, such as the following:

Carbon dioxide;
ABC Multipurpose dry chemical;
Halon 1301 (used in built-in total-flood systems);
Halon 1211 (used in portable extinguishers).

Fires involving flammable gases are usually controlled by eliminating the source of fuel, i.e. closing a valve.

Technically, flammable and combustible liquids do not burn. However, under certain conditions, they generate sufficient quantities of vapors to form ignitable vapor-air mixtures. As a general rule, the lower the flash point of a liquid, the greater the fire and explosion hazard.

NOTE: The flash point of a liquid is the minimum temperature at which it gives off sufficient vapor to form an ignitable mixture with the air near the surface of the liquid or within the vessel used.

It is the responsibility of the user to ensure that all Class B combustibles are properly identified, labeled, handled, and stored. If assistance is required, contact Hardage Construction's Safety Department. Safe handling of Class B combustibles includes the following:

Use only approved containers, tanks, equipment, and apparatus for the storage, handling, and use of Class B combustibles.

Dispense liquids from tanks, drums, barrels, or similar containers only through approved pumps taking suction from the top or through approved self-closing valves of faucets.

Storage, handling, and usage of Class B combustibles only in approved locations where vapors cannot reach any source of ignition, such as heating equipment, electrical equipment, oven flame, mechanical or electrical sparks, etc.

7.6.7 Fire Exits/Exit Corridors

Exit corridors must not be used for storage. The Life Safety Code, NFPA 101, requires that buildings designed for human occupancy must have continuous and unobstructed exits to permit prompt evacuation of the occupants and allow necessary access for responding emergency personnel. The intent of the Code is to keep exits free from obstructions and clear of combustible materials.

Attention to housekeeping, therefore, is very important. "Temporary" storage of furniture, equipment, supplies, or anything else is not permitted in exit ways. Combustibles, including recyclable waste paper, are not permitted in exit ways.

7.6.8 No Smoking

Smoking is prohibited in all corporate or field offices.

Smoking is forbidden in certain areas for fire or health safety reasons. Such areas include the following:

Where flammable gases or liquids are stored, handled, or used.

Where significant quantities of combustible materials, such as paper, wood, cardboard, or plastics are stored, handled, or used.

Where liquid- or gaseous-oxygen is stored, handled, or used.

Within 20 ft of a smoke detector.

In tape and record storage vaults and computer equipment areas .

Areas that are designated **"No Smoking"** areas for fire safety reasons are indicated by large rectangular signs consisting of white backgrounds with red letters stating **"NO SMOKING."**

7.6.9 Fueling

Where flammable liquids are used, employees shall be trained to deal with: spillage during fueling operations; cleanup operation, the types and designs of fueling hoses and the specific types of fuel they can handle, whether fueling is being done with a nozzle that is a gravity flow system or self-closing; how to avoid spills; and recognition that if a spill does occur, the safety of restarting an engine.

Employees must be aware that an open flame or light near any fuel or fuel operation is prohibited when fueling or the transfer of fuel is occurring. **"NO SMOKING"** signs shall be posted conspicuously.

7.8.10 Combustible Materials

All combustible scrap, debris and waste materials (oily rags, etc.) must be stored in covered metal receptacles and removed from the work site promptly.

Proper storage to minimize the risk of fire, including spontaneous combustion must be practiced. Only approved containers and tanks are to be used for the storage and handling of flammable and combustible liquids. All connections on drums and combustible liquid piping, vapor and liquid must be kept tight. All flammable liquids shall be kept in closed containers when not in use (e.g., parts-cleaning tanks, pans, etc.).

Bulk drums of flammable liquids must be electrically grounded and bonded to containers during dispensing. Storage rooms for flammable and combustible liquids must have explosion-proof lights, and have mechanical or gravity ventilation.

No smoking signs must be posted on liquefied petroleum gas tanks. Liquefied petroleum storage tanks shall be guarded to prevent damage from vehicles. All solvent wastes and flammable liquids shall be kept in fire-resistant, covered containers until they are removed from the work site.

Vacuuming shall be used whenever possible rather than blowing or sweeping combustible dust. Fire separators shall be placed between containers of combustibles or flammables when stacked one upon another to assure their support and stability. Fuel gas cylinders and oxygen cylinders must be separated by 20 feet, fire resistant barriers, etc., while in storage.

7.8.11 Fire extinguishers

Except for special circumstances, all construction use fire extinguishers shall be type A,B,C.

Fire extinguishers must be mounted within 75 ft. of outside areas containing flammable liquids, and within 10 ft. of any inside storage area for such materials. All extinguishers must be serviced, maintained and tagged at intervals not to exceed one year. Extinguishers shall be placed free from obstructions or blockage. All extinguishers must be fully charged and in their designated places unless in use.

Storage tanks shall be adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes. Storage tanks are equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure.

HOT WORK PERMIT

Work to be Performed_____

Date_____Time: Start_____am/pm Stop_____am/pm

Tools to be used/Special Hazards:

Permit issued to:

_____

To be completed by the supervisor of area where work is to be performed.

ITEM	YES	NO	COMMENTS
Lines Washed			
Lines Drained			
Lines Pressure Vented			
Lines disconnected			
Valves off & tagged			
Power off & tagged			
Neighboring areas Notified			
Extinguishers			
Manways, sewer, & Floor drains			
Oxygen			
L.E.L.			
Fire Watch (Name)			

Form #505-6/98

HOT WORK PERMIT

To be completed by maintenance or contractor personnel.

ITEM	YES	NO	COMENTS
Lines Blinded			
Power Lock			
Valves locked			
Air Mask			
Air bottle (s) checked			
Glasses & Gloves			
Protective Clothing			
Area roped off			
Barricades & Signs			
Screens & Curtains			

I certify all the terms above have been completed and hereby authorize the permit.

Maintenace Signature

Supervisor's Initial

Copies to: Safety Department – Area Supervisor – display at work area

Form #505-6/98

7.7 POWER TOOLS AND EQUIPMENT

7.7.1 Company Provided Tools

Hardage Construction provides hand and powered portable tools that meet accepted safety standards. A damaged or malfunctioning tool must not be used; it must be turned in for servicing and a tool in good condition obtained to complete the job. Employees must use the correct tool for the work to be performed; if they are unfamiliar with the operation of the tool, they must request instruction from their supervisor before starting the job. Supervisors are responsible for ensuring that their workers are properly trained in the operation of any tool that they are expected to operate. An employee is not permitted to use a power-actuated tool (such as Hilti guns, etc.) unless instructed and licensed by the manufacturer.

7.7.2 Grounding

Tools that are not double-insulated must be effectively grounded and tested. Testing must be accomplished before initial issue, after repairs, and after any incident that could cause damage, such as dropping or exposure to a wet environment.

Grounded tools must always be used with an effectively grounded circuit. Any extension cord used with a grounded tool must be a three-wire, grounded type.

Electric-powered hand tools used on construction sites, on temporary wired circuits, or in wet environments will be used in conjunction with an approved ground fault circuit interrupter (GFCI).

The responsibility for implementing and maintaining grounding rests with the individual supervisors or subcontractor involved.

Documentation of tool testing will be maintained by the group owning powered hand tools.

Repairs of defective tools will only be made by qualified repair personnel.

7.7.3 Portable Power Tools

Portable power tools pose a special danger because they are small and light, yet they can do great bodily harm if used improperly or poorly maintained. The following rules apply to all power tools, but are especially important when handling portable saws, drills and power screw drivers.

1. Check your equipment before you use it. All grinders, saws and similar equipment shall be equipped with appropriate safety guards. Power tools shall not be used without the correct shield, guard, or attachment recommended by the manufacturer.

2. Portable circular saws must be equipped with guards above and below the base shoe. Circular saw guards shall be checked periodically and before each use to assure they are not wedged up, thus leaving the lower portion of the blade unguarded.

3. All rotating or moving parts of equipment shall be guarded to prevent physical contact. All cord-connected, electrically-operated tools and equipment shall be effectively grounded or of an approved double insulated type. Effective guards must be in place over belts, pulleys, chains, sprockets on equipment such as concrete mixers, air compressors, etc. If portable fans are provided, they must be equipped with full guards or screens having openings 1/2 inch or less.

Power tools are either battery operated or wired. If battery operated, do not under estimate their power. A small electric drill or power screw driver can cause a severe injury if mishandled. While not usually a shock hazard, the battery pack contains toxic chemicals and does emit a low voltage electric current. Don't drop or incinerate the battery pack, or a tool with a self-contained power source.

Hard wired equipment can be portable or fixed. Typically used with extension cords, the more powerful hard wired equipment presents a double safety problem: the actual equipment plus its electrical power source. Ground-fault circuit interrupters must be provided on all temporary electrical 15 and 20 ampere circuits used during periods of construction. Pneumatic and hydraulic hoses on power-operated tools shall be checked regularly for deterioration or damage.

Make sure the tool has a trigger release that will **NOT** lock the tool into a continuous operation mode.

Powder Actuated Tools, Forklifts, Cranes and Lift Units require a special operator card. Have the appropriate certification card before operating this equipment.

7.7.4 Tool Maintenance

Faulty or improperly used hand tools are a safety hazard. All employees shall be responsible for ensuring that tools and equipment (both company and employee-owned) used by them or other employees at their workplace are in good condition. Hand tools such as chisels, punches, etc., which develop mushroom heads during use, must be reconditioned or replaced as necessary. Broken or fractured handles on hammers, axes and similar equipment must be replaced promptly. Worn or bent wrenches shall be replaced regularly. Appropriate handles must be used on files and similar tools. Appropriate safety glasses, face shields, etc., must be worn while using hand tools or equipment which might produce flying materials or be subject to breakage. Eye and face protection must be worn when driving in tempered spuds or nails.

Tools and equipment must be disconnected whenever you are involved in maintenance, even changing a saw blade.

To prevent a hazard, any equipment requiring service that would put a worker in jeopardy of being pinched or crushed must be blocked up.
Jacks must be checked periodically to assure they are in good operating condition. Tool handles must be wedged tightly into the heads of tools. Tool cutting edges shall be kept sharp enough so the tool will move smoothly without binding or skipping. When not in use, tools shall be stored in a dry, secure location.

When assigned to operate a power tool, make sure you are familiar with its safe operation. Do not operate it until you understand the operator's manual and a foreman has explained how to use it safely.

7.8 COMPRESSED GASES

7.8.1 Introduction

This section contains guidelines and requirements for the safe use of flammable and/or compressed gases. It covers the use of flammable-gas piping systems, high-pressure gas cylinders, manifolded cylinders, and compressed air.

7.8.2 Hazards

All gases must be used in a manner that will not endanger personnel or property. Hazards associated with handling and use of flammable and/or high-pressure gases include the following:

1. Injuries caused by flying objects accelerated by an explosion or pressure release;

2. Almost certain death if a flammable mixture is inhaled and then ignited;

3. Asphyxiation;

4. Secondary accidents such as falls or electrical shocks;

5. Fire caused by ignition of flammable gases;

7.8.3 Relief Valves

All systems, system components, and piping subject to over-pressures must be equipped with relief devices.

7.8.4 Fire Risk

Fire requires three elements: fuel, oxygen, and ignition. Any operation that places a flammable gas in the presence of an oxidant (air, oxygen) and an ignition source (spark, flame, high temperature) is extremely dangerous. To reduce the risk of fire, eliminate two of these three elements.

Thus, when using flammable gases, (1) eliminate ignition sources and (2) prevent mixing of fuel with air or oxygen. Contain or vent fuel.

All ignition sources, e.g., welding torches, lit cigarettes, electric arcs, electrostatic charges, and pilot lights, must be kept away from flammable gases at all times.

Ventilation must be provided to prevent entrapment of flammable gases in closed areas. If the gas is lighter than air, overhead ventilation is required.

Gases denser than air must be prevented from entering trenches and manholes where they can collect and form explosive mixtures with air.

Opening a hydrogen gas cylinder valve before attaching the regulator is not recommended since the gas may be ignited by static charge or friction heating.

Closing the valve stops the flame immediately.

Never use a flame to detect flammable gas leaks. Use soapy water or use other approved methods.

If a flammable gas cylinder is discovered with a small leak and the gas has not ignited, the cylinder must be moved carefully to a safe outside area. If the leak is serious or the gas has ignited, evacuate the area, contact **Project Superintendent**, and call the local Fire Department immediately.

7.8.5 Cylinder Handling

Compressed gas cylinders are dangerous when handled incorrectly. Always assume that a cylinder is pressurized. Handle it carefully. Never throw, bang, tilt, drag, slide, roll, or drop a cylinder from a truck bed or other raised surface.

If a cylinder must be lifted manually, at least two people must do the lifting. Because of their shape, smooth surface, and weight, gas cylinders are difficult to move by hand. A truck or an approved cylinder handcart must always be used to move a cylinder. Cylinders must be fastened in metal cradles or skid boxes before they are raised with cranes, forklifts, or hoists. Rope or chain lifting slings alone must **NOT** be used. Cylinders, even empty ones, must never be used as rollers for moving materials, as work supports, etc. If damaged, a cylinder can cause severe injuries including lung damage from inhalation of toxic contents and physical trauma from explosion. A pressurized gas cylinder can become a dangerous projectile if its valve is broken off.

When a cylinder is not connected to a pressure regulator or a manifold, or is otherwise not in use, it is extremely important that the cylinder valve be kept closed and the safety cap be kept in place -- the cap protects the cylinder valve (do not lift cylinders by their caps).

Cylinders containing compressed gases shall not be subjected to a temperature above 125 degrees F. Flames, sparks, molten metal, or slag must never come in contact with any part of a compressed gas cylinder, pressure apparatus, hoses, etc. Do not place cylinders where they might become part of an electric circuit. When cylinders are used in conjunction with electric welding, ensure that the cylinders cannot be accidentally grounded and burned by the electric welding arc.

Never attempt to repair, alter, or tamper with cylinders, valves, or safety relief devices.

Always identify the contents of a gas cylinder before using it. If a cylinder is not clearly labeled, return it.

Before using a cylinder, be sure it is properly supported with two metal chains or the equivalent to prevent it from falling.

7.8.6 Working With Gases

Suitable pressure-regulating devices and relief devices must always be used when gas is admitted to systems having pressure limitations lower than the cylinder pressure.

Gas cylinder valves, except for Hydrogen gas, should be "cracked" (opened slightly) momentarily before regulators are attached to blow dirt off the valve seats, but the valve outlet shall always be pointed away from people or equipment. (Cracking the valve is not recommended with hydrogen because it can be ignited by static charge or friction.) After the regulator is securely attached to the cylinder valve, fully release (turn counter-clockwise) the pressure-adjusting screw of the regulator before opening the cylinder valve. Open gas cylinder high pressure valves slowly; this gives compression heat time to dissipate and prevents "bumping" the gauges. Never use a wrench on any cylinder-valve hand wheel.

Keep removable keys or handles on valve spindles or stems while cylinders are in service.

Never leave pressure in a system that is not being used. To shut down a system, close the cylinder valve and vent the pressure from the entire system.

Equipment must not be disassembled while it is under pressure. Be aware that any valved-off portion of the system may still be under pressure; bleed the hose, line, or vessel before disassembly to ensure that there is not enough pressure built up to propel loose objects.

Connections to piping, regulators, and other appliances shall always be kept tight to prevent leakage. Where hose is used, it shall be kept in good condition.

About 30 psi gauge pressure (0.2 MPa) must be left in "empty" cylinders to prevent air from entering the cylinder and contaminating it; air contamination in a hydrogen cylinder is extremely dangerous.

Before a regulator is removed from a cylinder, close the cylinder valve and release all pressure from the regulator.

Before returning an empty cylinder, close the valve and replace the cylinder-valve protective cap and outlet cap or plug, if used.

7.8.7 Cylinder Storage

Cylinders not actively in use inside of buildings must be stored outside and must be fastened (with two metal chains or bars or in a fixture) to prevent them from falling if they are bumped or shaken.

When gases of different types are stored at the same location, cylinders must be grouped by types of gas, and the groups must be arranged in accordance with the gases contained, e.g., flammable gases must not be stored near oxygen.

Storage rooms or areas shall be dry, cool, well ventilated, and, where practical, fire resistant; must have solid, level floors or storage surfaces; and must be away from traffic. Storage in sub-surface locations shall be avoided. Cylinders must not be stored at temperatures above 125 degrees F. or near radiators or other sources of heat, near sparking devices, or near salt or other corrosive chemicals. If stored outside, cylinders must be protected from continuous direct sunlight, extreme weather, or moisture.

7.8.8 Supervisor Responsibilities

Supervisors must make periodic surveys of regulators in their areas. Damaged, unreliable, or otherwise defective regulators must be replaced immediately. All surplus regulators must be inspected, cleaned, adjusted, and repaired as required.

Two-stage regulators for inert gases are equipped with two relief valves that protect the regulator diaphragms and gauges from excessive over-pressure. Relief valves on regulators for use with flammable, toxic, and/or radioactive gases must be vented to a safe location. The second stage of a two-stage regulator will normally be adjusted so that the low-pressure output cannot exceed 67% of the highest reading on the low-pressure output gauge; the low pressure output relief valve will be set to open at (or under) the highest reading on the low-pressure output gauge. Users are cautioned that additional pressure-relief valves may be required to protect downstream equipment.

Single-stage cylinder regulators (except acetylene regulators) are equipped with a single relief device that is set to open at (or under) the highest reading on the output gauge. These regulators will be adjusted to limit the output pressure to 67% of the highest reading of the output gauge.

7.8.9 Diaphragm Failure

Diaphragm failure will cause the cylinder gas to escape to the surrounding atmosphere through holes in the regulator body. To reduce the probability of diaphragm failure, high-pressure regulators are equipped with stainless steel diaphragms. Regulators for use with flammable and/or toxic gases can be obtained with a bonnet fitting which allows the regulator to be vented.

7.8.10 Welding, Cutting and Brazing

Only authorized and trained personnel are permitted to use welding, cutting or brazing equipment. All operators must have a copy of the appropriate operating instructions and are directed to follow them.

Suitable fire extinguishing equipment must be available for immediate use before starting to ignite the welding torch. The welder is strictly forbidden to coil or loop welding electrode cable around its body.

When welding is done on metal walls, precautions must be taken to protect combustibles on the other side. Before hot work is begun, used drums, barrels, tanks and other containers must be so thoroughly cleaned that no substances remain that could explode, ignite or produce toxic vapors. It is required that eye protection helmets, hand shields and goggles meet appropriate standards.

Employees exposed to the hazards created by welding, cutting or brazing operations must be protected with personal protective equipment and clothing.

Check for adequate ventilation where welding or cutting is performed. When working in confined spaces, environmental monitoring tests shall be taken and means provided for quick removal of welders in case of emergency. (Refer to Confined Spaces section for more details)

7.8.11 Compressors and Compressed Air

All compressors must be equipped with pressure relief valves and pressure gauges. All compressor air intakes must be located and equipped to ensure that only clean, uncontaminated air enters the compressor. Each air receiver must be provided with a drain pipe and valve at the lowest point for the removal of accumulated oil and water. Compressed air receivers must be periodically drained of moisture and oil. All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

7.8.12 Compressed Gases

7.8.12.1 Hydrogen

Hydrogen is a colorless, odorless, non-toxic, and highly flammable gas. It is the lightest gas, being only 0.07 times the density of air and having a rate of diffusion 3.8 times faster that air, which allows it to fill a confined space rapidly.

The danger hydrogen poses is evident from its wide range of flammable mixtures: 4% to 75% in air and 4% to 94% in oxygen. Hydrogen-air mixtures can be ignited by an extremely low energy input, equal to about 10% of that required to ignite a gasoline-air mixture. High pressure hydrogen leaks will usually ignite as a result of the static electricity generated by the escaping gas. The ignition temperature of hydrogen is 932 degrees F, its flame velocity is 270 cm/sec (almost 10 times the velocity of a natural-gas flame), and it burns with a virtually colorless (invisible) flame at 3713 degrees F.

If ignited, unconfined hydrogen and air mixtures will burn or explode depending upon the mixture. Confined mixtures may detonate (burn at sonic velocity) depending upon the mixture and the geometry of the confined space. Hydrogen is not toxic but can cause asphyxiation.

7.8.12.2 Oxygen

Oxygen supports combustion, but is itself nonflammable. Oxygen lowers the ignition point (in air) of flammable substances and causes them to burn more vigorously. Materials such as oil and grease burn with nearly explosive violence in oxygen, even in minute quantities. Therefore, oxygen cylinders must **NOT** be handled with greasy or oily hands or gloves, and must **NOT** be stored near highly combustible materials such as oil, grease, or reserve acetylene.

Oxygen must **NEVER** be used to purge lines, to operate pneumatic tools, or to dust clothing; cloth, plastics, etc., saturated with oxygen burn explosively.

Accordingly, oxygen cylinders must **NEVER** be used as hat racks, clothes hangers, etc., since leaky fittings can result in accumulations of gas in the covering material.

Insects in oxygen "pigtails" can ignite spontaneously and may cause sufficient heat and over-pressure to burst the pigtail, valve, or manifold. Don't leave pigtails disconnected or uncapped.

Do not use white lead, oil, grease, or any other non-approved joint compound for sealing oxygen-system fittings. Threaded connections in oxygen piping must be sealed with joint compounds or Teflon tape approved for oxygen service.

When high pressure oxygen cylinders are stored inside a building, they must be separated from flammable gas cylinders by at least 20 feet or by a fire-resistive partition.

7.8.12.3 Acetylene

Acetylene is used principally with welding and cutting torches. Commercial acetylene gas is colorless and highly flammable with a distinctive garlic-like odor. Acetylene, in its free state under pressure, may decompose violently; the higher the pressure, the smaller the initial force required to cause an explosion. Therefore, acetylene is stored in acetone, which dissolves 300 times its volume of acetylene. Acetylene cylinders are filled with a porous filler material that holds the acetone. The combination of filler and acetone allows acetylene to be contained in cylinders at moderate pressures without danger of explosive decomposition. Full cylinder pressure is 250 psig at 70 degrees F.

CAUTION: When acetylene is withdrawn from its cylinder too rapidly, the gas cannot come out of solution fast enough; the downstream pressure drops, and liquid acetone is thrown out of the cylinder and may limit the flow of the pressure-reducing regulator.

The following precautions are recommended when working with acetylene: To prevent flashbacks, check valves are required in welding gas lines and at the welding/cutting torch. If the acetylene pressure drops, the oxygen pressure at the torch can push oxygen back up the acetylene line where it can mix with acetylene and cause a flashback.

Copper must not be used in acetylene piping. Copper forms an impact-sensitive copper acetylide.

NEVER use free acetylene gas outside the cylinder at pressures over 15 psig (30psia); it can decompose violently.

Acetylene cylinders shall be used or stored only in an upright position to avoid the possibility of acetone leaking from the cylinder. If an acetylene cylinder has been stored horizontally, the cylinder shall be put upright and left in that position for about 30 minutes before being used.

When cylinders are empty of acetylene, valves must be closed to prevent evaporation of the acetone.

Acetylene cylinders may be filled only by an authorized supplier.

7.9 CONCRETE AND MASONRY

7.9.1 General Requirements

7.9.1.1 Reinforcing Steel Guards

All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

7.9.1.2 Post-tensioning Operations

No employee (except those essential to the post tensioning operations) shall be permitted to be behind the jack during tensioning operations.

Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

7.9.1.3 Riding the Bucket

No employee shall be permitted to ride concrete buckets.

7.9.1.4 Working Under Loads

No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into place.

To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, is exposed to the hazards associated with falling concrete buckets or concrete.

7.9.1.5 Personal Protective Equipment

No employees shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

7.9.1.6 Masonry Saws

Masonry saws shall be guarded with a semicircular enclosure over the blade. A method for retaining blade fragments shall be incorporated in the design of the semicircular enclosure.

7.9.1.7 Power Concrete Trowels

Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a "Dead Man" control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

7.9.2 Cast-In-Place Concrete

7.9.2.1 Formwork

Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting, without failure, all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.

Reinforcing steel for walls, piers, columns, and similar vertical structures shall be adequately supported to prevent overturning and to prevent collapse.

Plans, including all revisions, for jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

7.9.2.2 Shoring and Reshoring

All shoring equipment (including equipment used in reshoring operations) shall be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.

Shoring equipment found to be damaged such that its strength is reduced shall not be used.

Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

Shoring equipment that is found to be damaged or weakened after erection, such that its strength is reduced, shall be reinforced.

The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

7.9.3 Precast Concrete

Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning, and to prevent collapse until permanent connections are completed.

Proper bracing pins shall be used which will not fall out or break under pressure or vibration.

Lifting hardware shall be capable of supporting at least five times the maximum intended load applied transmitted to the lifting hardware.

No employee shall be permitted under precast concrete members being lifted or tilted into position except those employees required for the erection of those members.

7.9.4 Requirements For Masonry Construction

7.9.4.1 Limited Access Zone and Bracing

A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall conform to OSHA Regulation 1926.706, as follows:

1. Be established prior to the start of construction wall.

2. Be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

3. Be established on the side of the wall which will be un-scaffolded.

4. Be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

5. Remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of the wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of #6 of this section have been met.

6. All masonry walls over eight feet in height shall be adequately braced to prevent overturning and prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

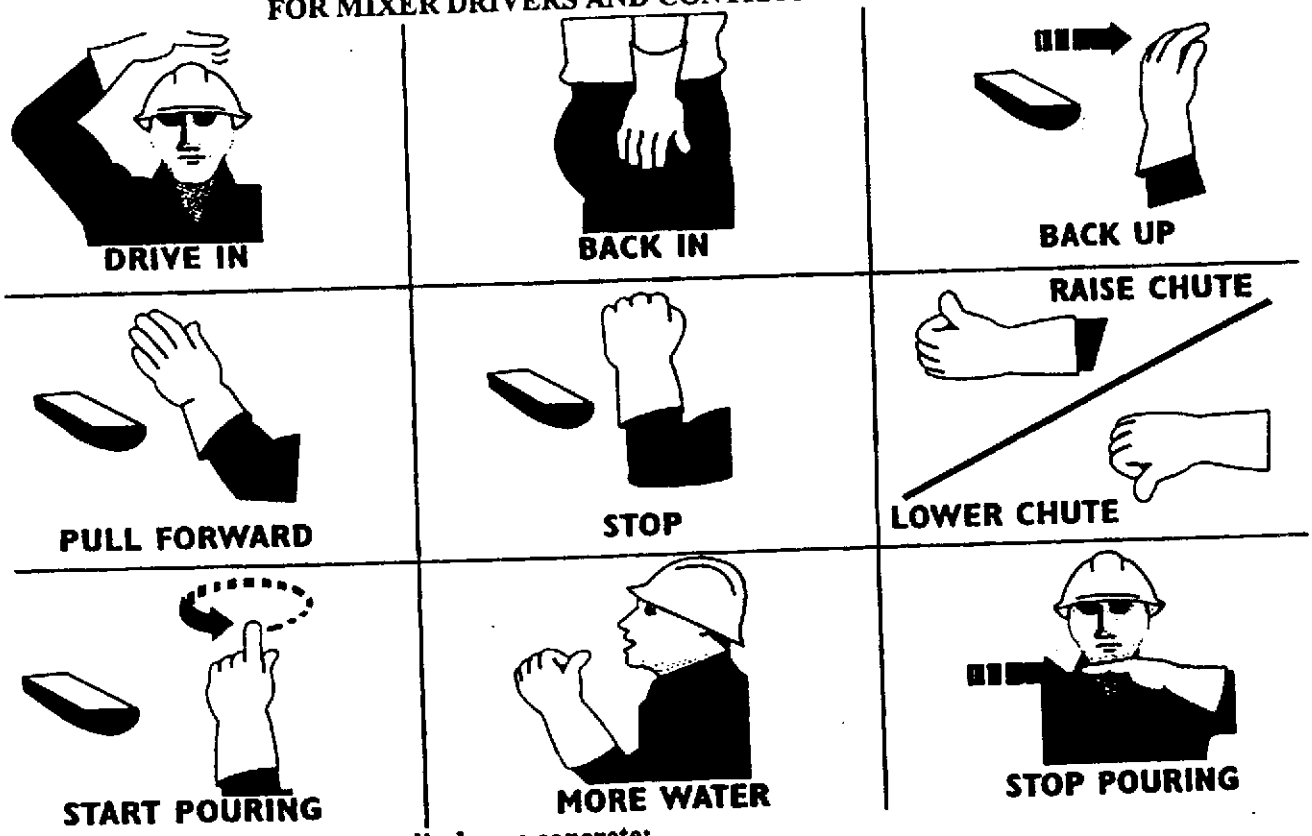
CONCRETE PLACEMENT SAFETY

When placing concrete from the ready mix truck, assign one person to:

- **Guide the truck into place after checking the are behind the truck for debris and people.**
- **Check for low overhead power lines.**
- **Stop the truck far enough from the edge of an excavation to avoid a cave-in.**

SIGNALS

FOR MIXER DRIVERS AND CONTRACTOR GUIDES



When setting up the chute to discharge concrete:

- Make sure other workers are clear of the area to avoid hitting them with the chute.
- Keep your fingers out of the chute hinges.
- Never move the truck with the chute unattended unless the chute is in the stowed position.

When placing concrete:

- Wear full-length, long-sleeve shirts, rubber boots, and gloves.
- Use knee boards when finishing flatwork.
- Wear eye protection when exposed to concrete splatter.
- Keep clean water on-site to wash skin and flush eyes in case of accidental exposure to concrete.

7.10

FALL PROTECTION

Due to the seriousness of fall injuries, employees must exercise extreme caution when working at heights. Use of all protection systems and equipment is mandatory on our projects. Any employee found in violation of Hardage Construction's Fall Protection requirements is subject to immediate termination. If for any reason you are uncomfortable with heights, notify your supervisor immediately.

A "Fall Protection System" is one in which some physical means or methods are provided to eliminate a fall exposure to employees. This may be accompanied by means of: Ladders, Scaffolds, Lift Units, Guardrails, Static Lines, Nets, Vertical Safety Lines, Standard or Retractable Lanyards, or a Full Body Harness. Fall protection on our project shall be accomplished by thorough analysis and pre-planning before work begins.

All Fall Arrest Equipment shall be used and installed in accordance with manufactures recommendations.

7.10.1 Positive Fall Protection:

A full body harness and tie-off is required for ***all*** work in excess of 6 feet. This includes leading edge work, and work from all aerial lifts. No more than 6 feet of free fall distance into any fall protection system is permitted.

If there is risk of a fall, then a fall arrest system must be utilized. Fall arrest systems require the use of a full body harness.

If static line system is utilized, documentation is required to demonstrate its effectiveness.

In the event a fall arrest occurs, the fall arrest system shall be taken out of service and the incident documented and submitted to the Safety Department.

The following is a summary of OSHA's Fall Protection Standard:

7.10.2 OSHA'S REVISED STANDARD ON FALL PROTECTION SUBPART M (SUMMARY) PER FEBRUARY 6, 1995.

The standards established are for fall protection requirements for construction workplaces, operations and circumstances that are not otherwise covered by existing OSHA standards. Existing OSHA standards which have with fall protection requirements ***that will not be superseded*** by the revised Subpart M, including the following:

1. Subpart L Scaffolds;
2. Subpart N Cranes and Derricks;
3. Subpart R Steel Erection;
4. Subpart S Tunneling;
5. Subpart V Electric Transmission/Distribution Lines; and
6. Subpart X Stairways and Ladder.

1926.501 Duty To Have Fall Protection

Employers must determine whether walking/working surfaces are structurally capable of supporting workers safely.

Workers on walking/working surfaces with unprotected sides or edges six (6) feet or higher above a lower level must be protected from fall by the use of guardrails, nets or fall arrest systems.

Workers constructing or working near leading edges at six (6) feet of higher above a lower level must be protected from falls by guardrails, nets or fall arrest systems.

Workers in hoist areas must be protected from falling more than six (6) feet by guardrails or personal fall arrest systems.

Workers must be protected from falling more than six (6) feet through holes (including skylights) by hole covers, guardrails or personal fall arrest systems.

Workers on the face of formwork or reinforcing steel must be protected from falling six (6) feet or more by personal fall arrest systems, nets or positioning devices.

Workers on the edge of excavations deeper than six (6) feet must be protected from falling by guardrails, fences or barricades when the excavations are not easily visible.

Workers less than six (6) feet above dangerous equipment must be protected from falling into or onto the equipment by guardrails or equipment guards.

Workers six (6) feet or higher above dangerous equipment must be protected from falling hazards by guardrails, personal fall arrest systems or nets.

Masons performing overhand masonry and related work six (6) feet or higher above lower levels must be protected from falling by guardrails, nets, personal fall arrest systems or must work in a controlled access zone.

Masons reaching more than ten (10) inches below the level walking/working surface on which they are working must be protected from falling by guardrails, nets or personal fall arrest systems.

Roofers working on low-slope roofs with unprotected sides and edges six (6) feet or more above lower levels must be protected from falls by guardrails, nets, personal fall arrest systems or any of the following combinations:

1. Warning Lines and Guardrails;
2. Warning Lines and Safety Nets;
3. Warning Lines and Personal Fall Arrest Systems, or
4. Warning Lines and Safety Monitoring.

Roofers on roofs fifty (50) feet or less in width may be protected by safety monitoring alone.

Roofers on steep roofs with unprotected sides and edges six (6) feet or higher above lower levels must be protected from falling by guardrail systems with toeboards, nets or personal fall arrest systems.

Workers near wall openings six (6) feet or higher above lower levels and less than 39 inches above the walking/working surface must be protected from falling by guardrails, nets or personal fall arrest systems.

Workers on walking/working surfaces six (6) feet or higher above lower levels which are not otherwise addressed must be protected from falling by guardrails, nets or personal fall arrest systems.

Where workers are exposed to falling objects, the employer must have each worker wear a hard hat and must:

1. Erect toeboards, screens or guardrails to prevent object from falling;
2. Erect a canopy structure and keep objects from the edge of the higher level; or
3. Barricade the area to which objects could fall, and keep objects away from the edge of the higher level.

1926.502 FALL PROTECTION SYSTEMS CRITERIA AND PRACTICES

Guardrails

The top edge of guardrails must be between thirty-nine (39) inches and forty-five (45) inches high.

Midrails, screen, mesh or intermediate vertical members must be installed between the top edge of the guardrail and the walking/working surface when there is no wall or parapet at least twenty-one (21) inches high.

Guardrails must be capable of withstanding a force of two hundred (200) pounds applied within two (2) inches of the top edge in any outward or downward direction.

With two hundred (200) pounds of downward force the top edge of the guardrail must not deflect to less than thirty-nine (39) inches.

Midrails, screens, mesh and intermediate vertical members must be capable of withstanding a force of at least one hundred-fifty (150) pounds applied in any downward or outward direction at any point along the midrail or other member.

Guardrails must be surfaced in a way that will prevent punctures, lacerations and snags.

The ends of top rails and midrails must not overhang terminal posts unless an overhang would not create a projection hazard.

Steel and plastic banding must not be used on top and mid rails.

Top and mid rails must be at least one-quarter (1/4) inch nominal diameter or thickness.

When guardrail is used in hoisting areas, a chain, gate or removable guardrail section must be placed across access opening when hoisting operations are not taking place.

When guardrails are used at holes they must be erected an all unprotected side or edges.

When guardrails are used to protect openings which re used for the passage of materials, not more than two (2) sides can utilize a removable guardrail.

Safety Nets

Safety nets must be installed as to close as possible, but not more than thirty (30) feet below the walking/working surface.

Safety nets must extend outward from the outermost projection of the work surface (see OSHA regulations for distance).

Drop tests must be performed on safety nets by dropping a four-hundred (400) pound, thirty to thirty-two (30-32) inch diameter bag of sand into the net from the highest walking/working surface (but not less than forty-two (42) inches.

When it is unreasonable to perform a drop test on a net, the employer, or a designated competent person, must certify that the net and net installation are in compliance with this standard.

Nets must be inspected at least once a week and defective nets and parts must be removed from service.

Effective January 1, 1998 body belts are not acceptable as part of a fall arrest system.

Personal fall arrest systems, when stopping a fall shall:

1. Limit maximum arresting force on an employee to 900 pounds when used with a body belt.
2. Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness.
3. Rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level.
4. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.
5. Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

The attachment point of the body belt shall be located in the center of the wearer's back. The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.

Effective January 1, 1998 only locking type snaphooks shall be allowed.

Lanyards and vertical life lines must have a maximum breaking strength of five-thousand (5,000) pounds.

Personal fall arrest systems when stopping a fall must limit the maximum arrest force on the worker to eight-hundred (1,800) pounds when used with a body harness.

Personal fall systems when stopping a fall must limit the maximum arrest force on the worker to nine-hundred (900) pounds when used with a body belt. **Hardage Construction employees shall use a full body harness with shock absorbing lanyard.**

Personal fall arrest systems must be rigged so that the worker can neither fall more than six (6) feet nor contact any lower level.

Positioning devices must be rigged to prevent free fall more than two (2) feet.

Warning lines or safety cable must be erected around all sides of a roof area.

Controlled access zones must be defined by a control line or other means that restricts access.

When using safety monitoring systems, a competent person must be used to monitor the safety of the workers.

The employer must provide training for each worker that may be exposed to fall hazards.

The employer must keep a written certification record to verify compliance with training requirements.

The employer must provide retaining when workers do not have the understanding and skills required by initial training.

This Is Not All Inclusive, For Further Detail Contact Hardage Construction Corporation's Safety Department Or Review The Standards.

7.11 SCAFFOLDING

This procedure outlines the safety requirements for scaffolds and platforms used on sites.

7.11.1 General Requirements

Scaffolds are to be erected, moved, altered, and dismantled by competent and experienced personnel, or under the supervision of competent person(s).

On scaffolds of 10 feet above the ground or floor, handrails, midrails, and toeboards are to be installed and scaffolds completely decked.

1. Guardrails shall be 2" X 4", or equivalent, and be approximately 42 inches high with a midrail. All guardrails must be capable of withstanding a 200 pound force applied in any direction.

2. Supports shall be at intervals not to exceed eight feet.

3. Toeboards shall be a minimum of four inches in height.

4. All planking shall be Scaffold Grade or equivalent.

If for some reason a platform or scaffold cannot be equipped with standard handrails or completely decked, then safety harnesses must be worn and properly tied off.

The footing or anchorage for scaffolding shall be sound, rigid, and capable of carrying four times the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose bricks, or concrete blocks will not be used to support scaffolds. Mudsills 12" X 12" and base plates are recommended. When using leveling jacks, 3/4 of its length must remain inside the scaffold leg.

Scaffolds are to be capable of supporting at least four times the maximum intended load.

The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

A safe access ladder extending 36" above the landing, or equivalent safe access shall be provided.

Scaffolds shall not be moved or dismantled without first removing all loose tools, materials and equipment resting on the scaffold deck.

All scaffolds shall rest on a suitable footing and shall stand level. Movable scaffolds shall have casters or wheels locked to prevent movement. Unstable objects such as loose bricks or concrete blocks shall not be used to support scaffold or planks.

Never work on scaffold in high winds or storms.

Do not climb bracing of scaffold.

Overhead protection shall be provided for men on scaffold exposed to overhead hazards.

7.11.2 Scaffold Planking

Scaffolds are not to extend over their end supports more than 12" or less than 6".

All planking on platforms shall be overlapped a minimum of 12", or secured from movement.

7.11.3 Tube and Coupler Scaffolds

Post must be accurately spaced, plumb, and erected on stable bases.

Scaffolds shall be tied and securely braced against the building at intervals not to exceed 30' horizontal and 26' vertically.

Scaffold legs shall be set on adjustable bases or plain bases placed on mudsills or other foundations adequate to support the maximum rated load. The mudsills must be secured in a way as to prevent sliding or moving from under the base plate.

7.11.4 Manually Propelled Mobile Scaffolds

Scaffolds and their components must be capable of supporting without failure at least four times intended maximum load.

Scaffold height shall not exceed four times the minimum base. Out-riggers would be included as a minimum base, or the unit is securely tied off to prevent tipping.

Scaffold is level/plumb at all times and used only on level, smooth surface, free of major defects.

Use of ladders or makeshift devices to increase the height of the scaffold on the working platform is prohibited.

The platform decking covers the full width of the unit, and is secured against displacement.

Scaffold bracing is not used to ascend or descend the units unless the bracing is specifically designed for climbing. An access ladder is provided and installed so as not to cause the unit to tip.

Guardrails, midrails, toeboards are installed on all open sides and ends of the scaffold.

Where persons are required to work or pass under a scaffold, the unit is provided with a screen, or equivalent protective device, to prevent materials from falling.

7.11.5 Inspections

All scaffolds shall be inspected on a daily basis (See Daily Scaffold Safety Checklist, Form #308 - 8/95) and performed by a competent person.

Before erecting and during dismantling, inspect all scaffold components. Those found with defects must be discarded immediately.

Handrails, midrails, cross bracing, and steel tubing shall be inspected for nicks, especially near center span, and indications where a welding arc has struck.

Scaffold components shall be straight and free from bends, kinks, dents, and severe rusting.

Scaffold frame weld zones shall be inspected for cracks and end tubing for splitting or cracking.

Manufactured decking shall be inspected for loose bolt or rivet connections and bent, kinked, or dented frame. Plywood surface should be checked for softening due to rot or wear, and peeling or laminated layers at edges. Safety planks shall be checked out for rot, cracks, and other damage. Also, inspect the rod or bolt and cleat.

Each quick-connecting device, whether a spring connection, a threaded connection, or toggle pin arrangement, shall be inspected to see that it operates properly.

DAILY SCAFFOLD SAFETY CHECKLIST

PROJECT: _____

CONTRACTOR: _____

DATE OF INSPECTION: _____

Note:

1. If any items on this checklist are not applicable, enter N/A under the "Yes" column.

2. If any items on this checklist are marked "No", a comment shall be added in space provided below to explain why it does not comply and when it will be corrected.

		Yes	No
1.	Are scaffold components and planking in a safe condition for use, and is planking graded for scaffold use ?	___	___
2.	Is the frame spacing and sill size capable of carrying intended loading ?	___	___
3.	Have competent persons been in charge of erection?	___	___
4.	Are sills properly placed and adequate size ?	___	___
5.	Have screw jacks been used to level and plumb scaffold instead of unsafe objects such as concrete blocks ?	___	___
6.	Are base plates and/or screw jacks in for contact with sills and frames ?	___	___
7.	Is scaffold level and plumb ?	___	___
8.	Are all scaffold legs braced with braces properly attached ?	___	___
9.	Is guard railing on all open sides and ends above 10 feet ?	___	___
10.	Has proper access been provided ?	___	___
11.	Has overhead protection or wire screening been provided where necessary ?	___	___
12.	Has scaffold been tied to the structure at least every 30 feet horizontally and 26 feet vertically ?	___	___
13.	Have free standing towers been guyed or tied every 26 feet in height ?	___	___
14.	Have brackets and accessories been properly placed ?	___	___
	Brackets ?	___	___
	Putlogs ?	___	___
	Tube and clamp ?	___	___
	All nuts and bolts tightened ?	___	___
15.	Is scaffold free of makeshift devices or ladders to increase height ?	___	___
16.	Are working level platforms fully planked between guard rails ?	___	___

DAILY SCAFFOLD SAFETY CHECKLIST (CONTINUED)

		Yes	No
17.	Does plank have a minimum 12 inches overlap, extended 6 inches beyond supports, and cleated at both ends ?	___	___
18.	Are toeboards installed properly ?	___	___
19.	Have hazardous conditions been provided for :		
	Power Lines ?	___	___
	Wind Loading ?	___	___
	Possible Washout of footings ?	___	___
	Uplift and overturning moments due to placement of brackets, putlogs or other causes ?	___	___
20.	Have personnel been instructed in the safe use of the equipment ?	___	___

Comments: _____

_____

_____

_____

_____

_____

_____

_____

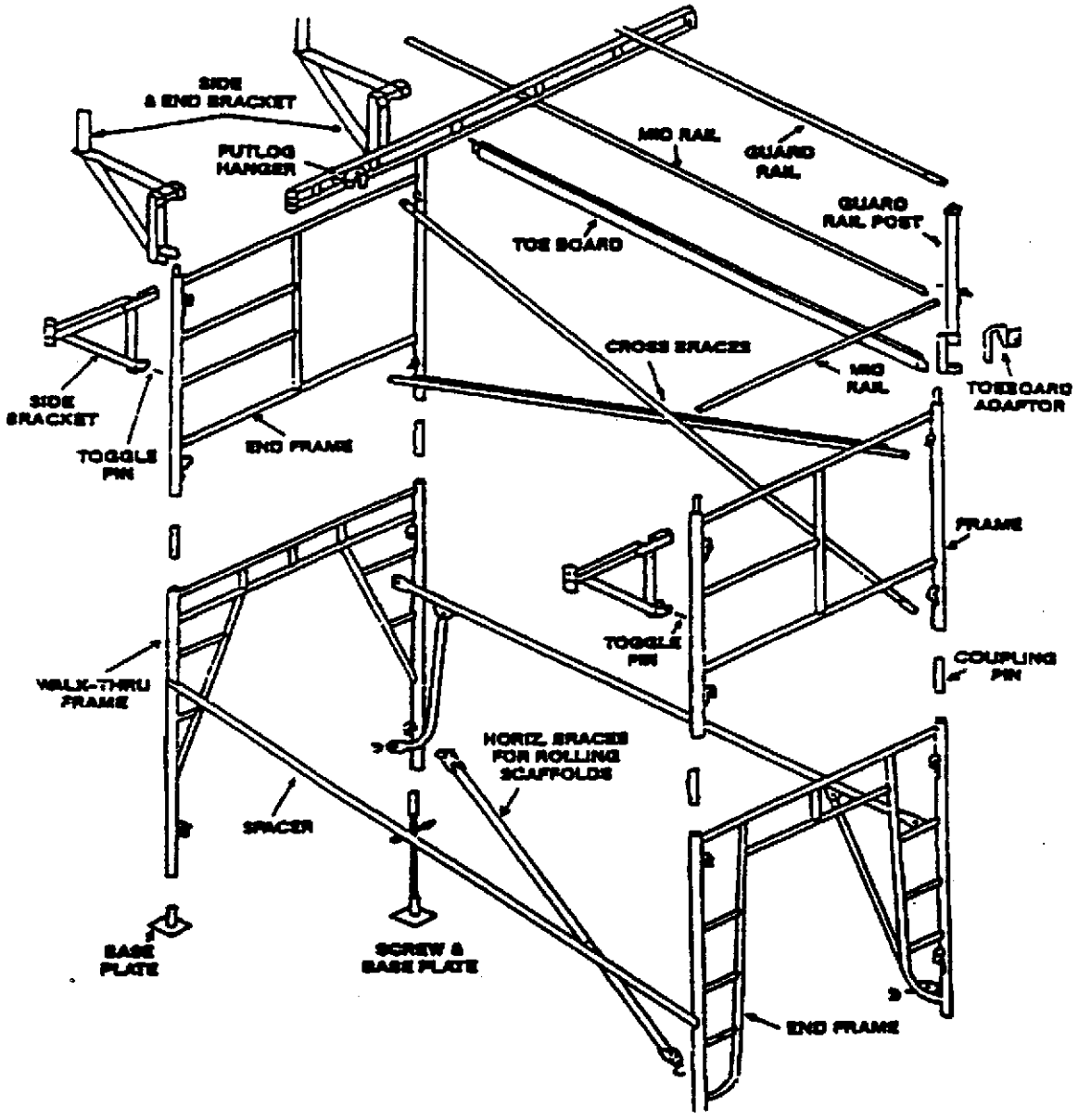
Project Superintendent
(Signature)

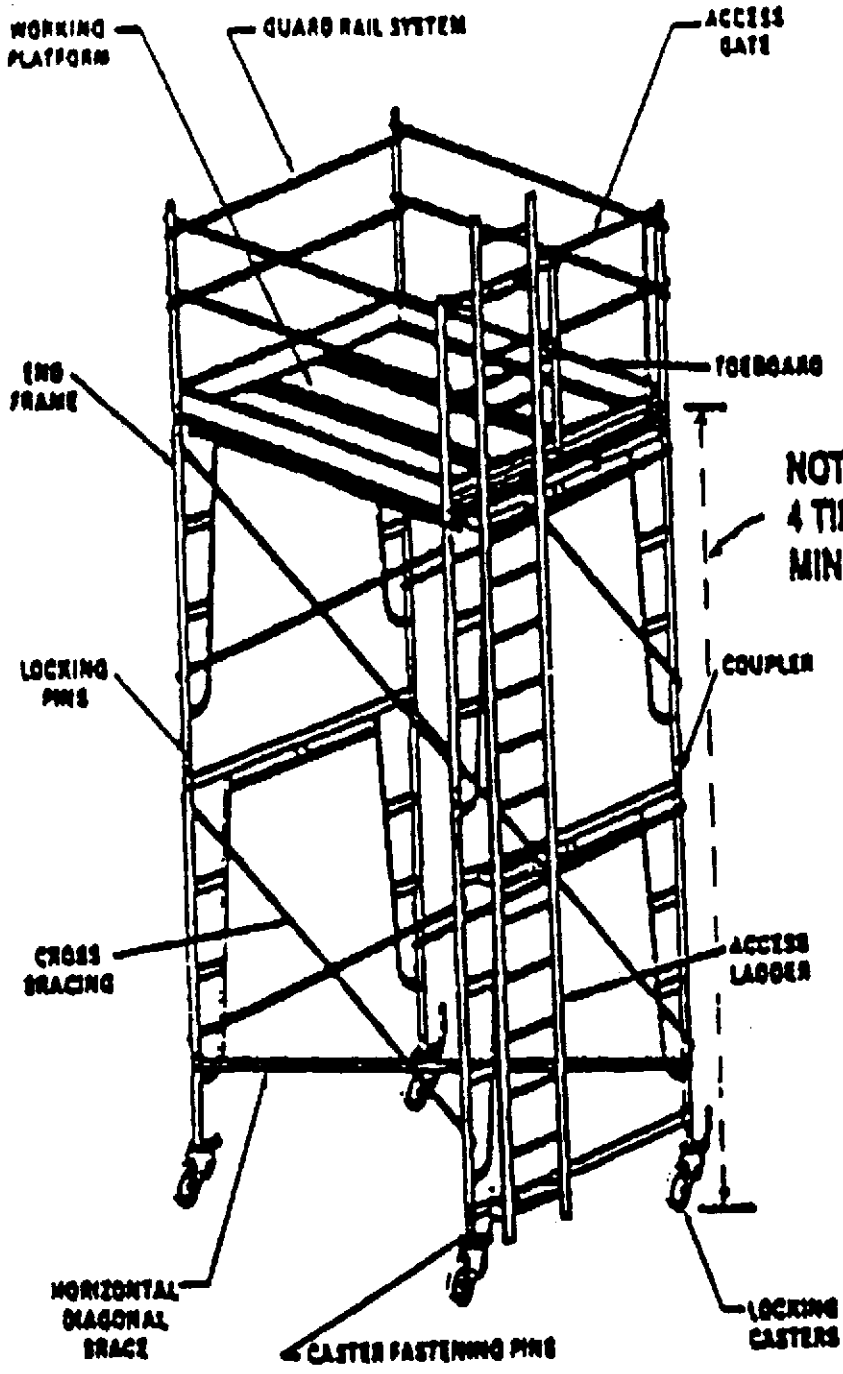
Foreman
(Signature)

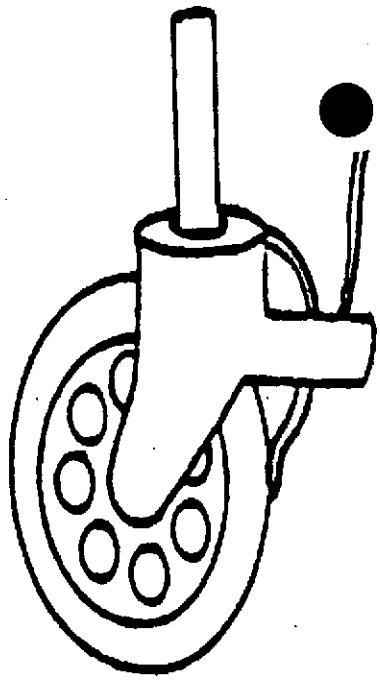
Form #308 - 8/95

METAL TUBULAR FRAME SCAFFOLDS -

Shall include accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall be designed, constructed, and erected to safely support four times the maximum rated load.







FABRICATED TUBULAR FRAME MANUALLY PROPELLED MOBILE SCAFFOLD

7.12 STAIRWAYS AND LADDERS

7.12.1 General Requirements

A stairways or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches or more, and no ramp, runway, sloped embankment, or personnel hoist provided.

A double cleated ladder or two or more separate ladders shall be provided when ladders are the only means of access or exit from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic.

7.12.2 Stairways

Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings of not less than 30 inches in the direction of travel, and extend at least 22 inches in width at every 12 feet or less of vertical rise.

Where doors or gates open directly on a stairway, a platform shall be provided, and swing of the door shall not reduce the effective width of the platform to less than 20 inches.

Metal pans landings and metal pans treads, when used, shall be secured in place before filling with concrete or other material.

All parts of stairways shall be free of hazardous projections, such as protruding nails.

Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels.

Stairways having four or more risers or rising more than 30 inches, whichever is less, shall be equipped with:

1. At least one handrail.

2. One stair rail system along each unprotected side or edge.

7.12.3 Ladders

Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet above the upper landing. The ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device shall be provided to assist employees in mounting and dismounting the ladder.

Ladders shall be used only for the purpose for which they were designed.

Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

Portable ladders with structural defects, such as broken or missing rungs, cleats, or steps, broken or split rails, shall be marked as defective and taken out of service immediately.

7.13 ELECTRICAL SAFETY

7.13.1 General Electrical Safety

Test equipment safety. Tests shall be made when the electrical equipment is de-energized, or, at most, energized with reduced hazard.

Be trained in emergency procedures. All persons working in areas of high hazard (with high-voltage power supplies, capacitor banks, etc.) must be trained in emergency response procedures, including cardiopulmonary resuscitation (CPR) certification.

Employees will be required to report any hazard to life or property that is observed in connection with electrical equipment or lines. Employees shall make preliminary inspections or appropriate tests to determine conditions before starting work. When equipment or lines are to be serviced, maintained or adjusted, employees must be aware of open switches. Lockouts must be tagged whenever possible.

Electrical tools or appliances must be grounded, or of the double insulated type. Extension cords being used must have a grounding conductor.

If GFCI's are installed on each temporary 15 or 20 ampere, 120 volt AC circuit, temporary circuits must be protected by suitable disconnecting switches or plug connectors with permanent wiring at the junction.

Exposed wiring and cords with frayed or deteriorated insulation must be repaired or replaced.

Flexible cords and cables must be free of splices or tape.

Clamps or other securing means must be provided on flexible cords or cables at plugs, receptacles, tools, equipment. The cord jacket must be held securely in place.

All cord, cable and raceway connections must be intact and secure.

In wet or damp locations, electrical tools and equipment must be appropriate for the use or location, or otherwise protected.

The location of electrical power lines and cables (overhead, underground, under floor, other side of walls) must be determined before digging, drilling or similar work is begun.

The use of metal ladders is prohibited in areas where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures or conductors.

7.13.2 Electrical Tag Out Procedure

When maintenance work is required on a machine, the following four steps are required to protect yourself and your co-workers from injury:

1. De-energize the machine if possible. Positively disconnect the machine from the power source. If there is more than one source of power, disconnect them all.

2. If possible, lock out all disconnect switches. You must be given a lock and a key for each disconnect before you begin working on the machine.

3. Tag all disconnect switches. Use the Yellow or Red safety tags which state in large letters -- **"DANGER... DO NOT OPERATE"**, or **"DANGER... DO NOT ENERGIZE"** and gives the name of the individual who locked out the equipment, date and time. The tag must also state **"DO NOT REMOVE THIS TAG"** (except the person who placed the tag after the machinery maintenance has been completed).

4. Test the equipment to insure it is de-energized before working on it. First, attempt to operate the equipment by turning on normally. Next, check all electrical lines and exposed areas with electric test equipment. Finally, short to ground any exposed connections using insulated grounding sticks. This test must be done even if the electrical connection is physically broken, such as pulling out a plug, because of the chance of discharging components.

A Tag Out Only Procedure May Be Used If The Machine Can Not Be Locked Out. If The Machine Is Supplied Electrical Power From A Single Source, Which Is Under The Exclusive Control Of A Trained And Qualified Repair Person At All Times And There Are Not Any Other Persons In The Repair Area Who Could Be Harmed By The Accidental Energizing Of The Machinery, Then Tag Out May Be Used Instead Of Lock Out/Tag Out.

7.13.3 Re-Energizing

Many accidents occur at the moment of re-energizing. If the machinery is to be re-energized, all persons must be kept at a safe distance away from the machinery. The re-energizing can be performed only by:

1. The person who performed the lock-out/tag out.

2. The person acting under the immediate and direct commands of the original lock-out/tag out person.

3. In the event of a shift change or other unavailability of the original person, then the original person shall, before leaving, appoint a surrogate original person and convey all of the steps taken to lock-out/tag out the equipment.

7.13.4 ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM COLOR CODING

All temporary 120 volt. 15 and 20 amp electrical power tools and equipment must be protected by Ground Fault Circuit Interrupters(GFCI), or inspected in accordance with the Assured Equipment Grounding Conductor Program (AEGC). (Refer to Section 7.13.5). Testing under the AEGC Program shall be performed before first use on new equipment; before equipment is used after an incident suspected of causing damage; and at intervals not exceeding three months. Test verification can be by means of color

coded marking tape on the equipment. If color coding is used, the following coding scheme is recommended:

1st Quarter Color Code:	**White**
2nd Quarter Color Code:	**Green**
3rd Quarter Color Code:	**Red**
4th Quarter Color Code:	**Orange**
Repair Or Incident Color Code:	**Brown**

Insure That All Electrical Apparatus Has Been Satisfactorily Tested And Is Color Code Prior To Use. (Refer to F. Coding Scheme for Assured Equipment Grounding Conductor Test Record for example).

7.13.5 ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM

1. **Scope:** This procedure describes requirements to assure the installation and maintenance of equipment grounding conductors for wiring on construction sites in accordance with Paragraph (b) (1) (ii) of Part 1910.304 of Occupational Safety and Health Standards and Paragraph (b)(1) (iii) of Part 1926.404 of Safety and Health regulations for Construction.

2. **Policy:** Ground fault circuit interrupters (GFCTs) are not required for 120 volt, single phase, 15 and 20 ampere receptacle outlets where all of the requirements of this procedure are implemented at the construction site. **Employees shall not** use any equipment which has not met the requirements of this procedure.

3. **Job Site Information**

   A. Name or description of construction site:_____

   B. Employer complying with this procedure is:_____

   C. Person designated to implement the procedure is:_____

4. **Requirements:** Equipment grounding conductors shall be installed and maintained in accordance with this instruction.

   A. **Installation:** Equipment grounding conductors shall be installed as follows:

      i. All 120 volt, single phase, 15 and 20 ampere receptacles shall be of the grounding type, and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacles in accordance with the applicable requirements of the National Electrical Code.

      ii. All 120 volt cord sets (extension cords) shall have an equipment grounding conductor which shall be connected to the grounding contacts of the connectors(s) on each end of the cord.

      iii. The exposed noncurrent-carrying metal parts of 120 volt cord and plug-connected tools and equipment that are likely to become energized shall be grounded in accordance with the applicable requirements of the National Electrical Code.

   B. **Daily Visual Inspection:** Employees will visually inspect receptacles, flexible cords sets (extension cord), electrical equipment and electrical tools before each day's use for external defects, such as deformed or missing pins for insulation, damage and for indication of possible internal damage. Where there is evidence of damage, the item shall be taken out of service until tests and any required repairs have been made.

   C. **Testing:** All 120 volt, single phase, 15 and 20 ampere receptacles **which are not a part of the permanent wiring of the building or structure,** 120 volt flexible cord sets, and 120 volt cord and plug connected equipment required to be grounded shall be tested by a competent person or persons who will upon completion of the tests record the results (i.e. Section E).

D. **Testing Schedule:** All required tests shall be performed:

i. Before its first use.
ii. Before equipment is returned to service following any repairs.
iii. Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over).
iv. At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

E. **Test Record:** Test verification shall be by means of numeric or color coded marking tape on the receptacles, cord set or equipment to identify that it has passed the test and to indicate the date (month or quarter) in accordance with section F coding scheme.

F. CODING SCHEME FOR ASSURED EQUIPMENT GROUNDING CONDUCTOR TEST RECORD

Color Coding Scheme

Month or Quarter	Quarter	Monthly	Numeric Coding Scheme
January	White	White	1
February		White & Yellow	2
March		White & Blue	3
April	Green	Green	4
May		Green & Yellow	5
June		Green & Blue	6
July	Red	Red	7
August		Red & Yellow	8
September		Red & Blue	9
October	Orange	Orange	10
November		Orange & Yellow	11
December		Orange & Blue	12
Repair or Incident	Brown	Brown	0

HAZARDOUS COMMUNICATION INDEX

8.0 HAZARD COMMUNICATION PREFACE

Each work site shall have a written **HAZARD COMMUNICATION (HAZCOM) PROGRAM.** The essence of the program is to provide a method of communication to all of the workers at the site, regarding the potential dangers of hazardous substances used in the construction progress. The Government requires that manufactures of hazardous substances supply information sheets regarding the safe usage of each substance, as well as dangers to be aware of regarding the effects of contact with the same. These sheets are known as **MATERIAL SAFETY DATA SHEETS (MSDS).**

Additional aspects of the HAZCOM program include the requirement of properly label containers of hazardous material and to train employees in the safe use of the materials being used.

The HAZCOM program shall be the responsibility of the Superintendent at the site and shall be kept in accessible and openly visible location known to the project trade foremen in the even of emergency requirements.

All Subcontractors using hazardous substances must provide their own HAZCOM Program on site with the MSDS sheets for those substances involved in their work. We do need a copy of their HAZCOM Program, so the Superintendent can verify that each Subcontractor affected does, in fact, have a program. This record keeping is accomplished with the Subcontractor Pre-construction Safety Checklist (Refer to #300-6/98). Many Subcontractors will send out a booklet of MSDS forms to cover all of their operations. It is the Subcontractors responsibility to log **ONLY** those products which pertain to the specific project.

For hazardous materials being utilized by Hardage Construction Corporation employees, the Project Superintendent shall place the MSDS in the HAZCOM section of this manual, sorted alphabetically by the product trade name. File only the product sheets that pertain to material being used on the site. **In addition, the Chemical Inventory List sheet must be filled in for each new MSDS form that arrives.**

At the project completion, the HAZCOM Program shall be purged of the MSDS sheets as it moves from job to job. The Chemical Inventory List shall be placed in the project safety file for storage as a permanent record.

In addition to the MSDS requirements, all Subcontractors are required to inform all other potentially affected personnel on site of the existence and potential hazards of any substance used. This should be done during the safety portion of the weekly Subcontractor meetings and documented in the notes.

The Superintendent shall inform any "temporary personnel" on site about the whereabouts and intent of the HAZCOM program, as well as providing the proper Personnel Protective Equipment to the workers if required while working with the materials.

HAZARD COMMUNICATION WRITTEN PROGRAM

This program has been prepared to comply with the requirements of the Federal OSHA standard 1926.59 and to insure that information necessary of the safe use, handling and storage of hazardous chemical is provided to and made available to employees.

This program includes guidelines or identification of chemical hazards and the preparation and proper use of containers, labels, placards, and other types of warning devices.

The working in this program deals with jobsite but the same stipulations apply to the corporate offices and company yards. The Hazard Communication Log MSDS file for any hazardous substances stored or used in those areas will be maintained at the main office by the Safety Department.

A. CHECMIAL INVENTORY

1. Hazardous chemicals brought onto the work site by Hardage Construction will be recorded on the Hazardous chemical inventory list.

B. CONTAINER LABELING

1. All chemicals on site will be stored in their original or approved containers with proper labeling attached, except small quantities for immediate use. Any container not properly labeled should be given to the Project Superintendent or appropriate trade foreman, whichever applies, for labeling or proper disposal.

2. Workers may dispense chemicals from original containers only in small quantities intended for immediate use. Any chemical left after the work is complete must, be returned to the original container or to the Project Superintendent or appropriate trade foreman for proper handling.

3. No unmarked containers of any size shall be left in the work area unattended.

Hardage Construction and it's subcontractors will rely on manufacturer applied labels whenever possible, and will ensure that these labels are maintained. Containers that are not labeled, or on which the manufactures label has been removed will be re-labeled.

4. Hardage Construction and it's subcontractors will ensure that each container is labeled with the identity of the hazardous chemical contained and any appropriate hazard warnings.

C. MATERIAL SAFETY DATA SHEETS (MSDS)

1. Employees working with a Hazardous Chemical may request a copy of the material safety data sheets (MSDS). Requests for MSDS's should e made to their trade foreman for substances used by their trade or to the Project Superintendent for those used by other trades.
2. MSDS's will be available to provide immediate reference to chemical safety information.

3. An emergency procedure to gain access to MSDS's information shall be established. The MSDS information, for Hardage Construction shall be available in the jobsite trailer (or office) in the Hazard Communication section of the company safety manual. All Subcontractors, using hazardous chemicals, shall have a Hazard Communications Program, an MSDS inventory and log sheets for products they bring onto the site. All trade foreman shall be informed of this file location.

D. EMPLOYEE TRAINING

All subcontractors (by contract) and Hardage Construction employees (by company policy) shall be trained to work safety with hazardous chemicals. Employee training will include:

1. Methods that may be used to detect a release of a hazardous chemical (s) in the work place,
2. Physical and health hazards associated with chemicals,
3. Protective measures to be taken,
4. Safe work practices, emergency responses and use of personnel protective equipment,
5. Information on the Hazard Communication Standard including:

- Labeling and warning systems, and
- An explanation of Material Safety Data Sheets

E. PERSONNEL PROTECTIVE EQUIPMENT (PPE)

Required PPE shall be available from each trade foreman for subcontract employees and from the Project Superintendent for Hardage Construction employees. Any employee found in violation of PPE requirements may be subject to disciplinary actions, up to and including removal from the job site and/or dismissal from the company.

F. EMERGENCY RESPONSE

1. Any incident of over exposure or spill of hazardous chemical/substance must be reported to the Project Superintendent at once.
2. The foreman or the immediate supervisor will be responsible for insuring that proper emergency response actions are taken in leak/spills situations.

G. HAZARD OF NON-ROUTINE TASKS

1. Each supervisor will inform employees of any special tasks that may arise which would involve possible exposure to hazardous chemicals.
2. A review of safe work procedures and use of required PPE will be conducted prior to the start of new work elements by each trade foreman. Where necessary, areas will be posted to indicate the nature of the hazard involved.

H. INFORMING OTHER EMPLOYEES

1. All on-site subcontractors are required to adhere to the provision of this Hazardous Communication Standard.

2. Information on hazardous chemicals known to be present on site will be exchanged with other subcontractors. This shall be covered in the weekly subcontractor meetings. Each subcontractor on site will be responsible for providing the necessary information on their employees, and others working in the vicinity.

I. POSTING

1. Hardage Construction shall post information for employees at jobsite on the Hazard Communication Standard. This information can be found at the jobsite trailer, or office at the request of the Project Superintendent.

J. COMMUNITY RIGHT TO KNOW

Hardage Construction and its subcontractors will inform the appropriate governmental agencies of reportable quantities of chemicals as defined by the 1986 Superfund Amendments and Re-authorization Act - known as SARA Title III.

COMMUNITY REIGHT TO KNOW REQUIREMENTS

SARA TITLE III

OSHA's Hazard Communication Standard requires employers to comply with the reporting elements of the 1986 Superfund Amendments and reauthorization Act (SARA).

Title III, of the Emergency Planning and Community Right to Know Act requires employers to submit certain chemical hazard information to state and local government when quality use exceed specified levels.

Employers required by OSHA to maintain Material Safety Data Sheets (MSDS) must send copies of the MSDS's to the State Emergency Response Commission, the local commission and local fire department.

Additionally, a hazardous chemical inventory form must be completed and filed with these agencies.

The Environmental Protection Agency (EPA) has established a toll free hotline to answer questions about SARA requirements (Chemical Emergency Preparedness Program Hotline Number is 1-800-535-0202.

CEPP operates from 8:30 a.m. to 4:30pm Eastern Standard Time, weekdays (note: CE PP Washington, DC numbers (202) 479-2449.

Additionally, a second hotline is in operation called the Small Business Ombudsman Hotline at 1-800-368-5888 (7:30 a.m. to 4:30 p.m. EST workdays) in Virginia the local number is (703) 557-1938.

A copy of a sample SARA reporting letter is contained in Page 8.

SARA REPORTING SAMPLE LETTER

Date:

Send to: State Emergency Response Commissions
Local Emergency Planning Committee
Local Fire Department
File

In accordance with the Superfund Amendments and Reauthorization Act of 1986, Title III Emergency Planning and Community Right to Know Act (*Name of Company*) company is submitting to you attention Material Safety Data Sheets (Sect. 311) and a Hazardous Chemical Inventory Form (Sect. 312) for our jobsite located at (*address of worksite*).

OSHA's Hazard Communication Standard requires employers who maintain material safety data sheets to submit the above in accordance with SARA Title III, Sect, 311-312.

Hardage Construction Corporation

HAZARDOUS COMMUNICATION EMPLOYEE TRAINING SHEET

(For Hardage Construction Corporations employees only - full or temporary)

By way of this Training sheet, I acknowledge that I have been informed of the following items relating to Hardage Construction Corporations' Hazard communication Program:

1. Hardage Construction has a Hazard Communication Program relating to the use and encounter of hazardous substances involved in employment. This program is kept in the Hazard Communication/MSDS section of the company safety manual, kept in plain view in the Project Superintendent's office (at each jobsite) and in the Safety Department (at the main office).

2. A chemical Inventory List and Material Safety Data Sheet (MSDS) file is also in place in the Hazard Communication binder at each jobsite.

3. In the event that workers are required to utilize or encounter a substance which may be hazardous during work, information relating to the safe use of such is available in the MSDS file listed above. Training and acquisition of any necessary protective equipment or apparel should occur at the direction of the Project Superintendent for the site related work, or the company Safety Department, for the work in the main office or company storage yard.

4. All employees are allowed access to the Hazard Communication/MSDS file for any information regarding hazardous materials used or encountered through employment with this company.

Employee Name (please print)_____

Employee Signature_____Date_____

(Review, sign and return to Personnel Department)

CHEMICAL FACTS

HOW CHEMICALS ENTER YOUR BODY

In order for a chemical to have any effect on you, you have to come in contact with a chemical in it's solid, liquid or gas form.

There are four "routes of entry" or paths a chemical can take.

Breathing (Inhalation)

Chemicals can enter through your lungs as you breath the air around you. Some chemicals, such as ammonia, can irritate your lungs, nose and throat. Others can be absorbed into your blood, traveling to an affecting the organs in your body. Prolonged exposure to Hazardous Substances like asbestos and other solid fiber materials can cause serious health problems. Dusts and fibers can become trapped in your lungs causing irritation, scarring and damage.

Regardless of the type of chemical you work with, your first line of defense against breathing in hazardous chemicals is to use an approved respirator.

Through Your Skin (Absorption)

Although the skin is a very effective barrier to most chemicals, it can be penetrated. Damage to the skin from cuts, scrapes, cracking, dryness or other conditions can allow a chemical to enter into the body. Some chemicals can damage the skin on contact and others pass through the skin and into your bloodstream. Some chemicals solvents such as toluene, gasoline and mineral spirits are absorbed easily through your skin. Some pesticides like parathion can easily pass through the skin, building up to poisonous levels in the body.

There are two easy steps which will prevent absorption - wearing gloves that are chemical resistant, and washing off any chemical contacts the skin as soon as possible. When you're washing, make sure you use a product designed for washing skin and not products like paint thinner, turpentine and benzene.

Swallowing (Ingestion)

A chemical can enter your body if you accidentally swallow it, or if your food or drink becomes contaminated. Simply washing your hands before you eat after working with chemicals can avoid the risk of exposure.

Injection

Chemicals can be accidentally injected into your body. If you work around high pressure equipment of any kind like compressed air, grease guns, or hydraulic lines, the potential exists for this kind of accident. Be extra cautious around any kind of pressurized spray equipment or high pressure lines and never use compressed air to clean off your hands, arms or clothing.

SOLVENTS

A solvent is a liquid that dissolves another substance. In construction, we most often see them used as cleaners, de-greasers, thinners, fuels and glues.

Solvents are grouped into three main types or classes. 1. Those containing water (aqueous solutions) like liquid forms of acids, alkalis and detergents; 2. Those containing carbon (organic solvents) like acetone, toluene and gasoline. 3. The third group contains chlorine in their chemical makeup and are called chlorinated solvents like methylene-chloride and trichloroethylene.

Solvents can enter into your body in two ways, by breathing, or by contact with your skin.

Any solvents you inhale can cause dizziness or headache as they affect your central nervous system. If you continue to breath vapors of a solvent you could develop nose, throat, eye and lung irritation and even damage to the liver, blood, kidneys, and digestive system.

Solvents on your skin can be absorbed into the body. Because solvents dissolve oils and greases, contact with your skin can dry it out producing irritation, cracking and skin rashes. Once a solvent penetrates through the skin it enters into the bloodstream and can attack the central nervous system and body organs.

Like all chemicals, the effect upon you will depend on a number of factors - how toxic it is; how long you are exposed; your own body's sensitivity; and how concentrated or strong the solvent is.

You can protect yourself from solvent hazards by following a few simple rules:

- Know what chemicals you are working with.
- Use protective equipment like gloves, safety glasses and proper respirators recommended for that chemical.
- Make sure your work area has plenty of fresh air.
- Avoid skin contact with solvents.
- Wash with plenty of soap and water if contact a solvent occurs.
- If a solvent splashes into your eye, flush with running water for a minimum of 15 minutes and get medical help.

For more information on the chemical's you work with contact from your supervisor or Company Safety Department.

ACIDS, BASES, ALKALI

ACIDS AND BASES (Caustics) can easily damage skin and eyes. How serious the damage is depends on how strong the chemical is, how long contact is maintained and what corrective actions are taken.

Acids and bases can be liquids, solid granules, powders, vapors or gases. A few commonly used **acids** include: sulfuric acid, hydrochloric acid, muriatic acid and nitric acid. Some common **bases** (caustics) are lye (sodium hydroxide) and potash (potassium hydroxide).

Both **acids and bases** can be corrosive, causing damage to whatever they come in contact with. The more concentrated the chemical the more dangerous it can be. Vinegar is a mild form of acetic acid, and as such it can be swallowed or rubbed into the skin with no damage, but a concentrated solution of acetic acid can cause serious burns.

Different **acids** react differently when they contact your skin. Sulfuric acid mixes with water to produce heat; when it contacts your skin it reacts with moisture causing burns. Hydrofluoric acid may not even be noticed if it spills on your skin but hours later as the acid is absorbed into the muscle tissue, it can cause deep burns that are very painful. Most **acids**, in a gas or vapor form, may react with the moisture in your nose and throat causing irritation or damage. Acetic and nitric acids don't react with water, so when these vapors are inhaled, they quickly penetrate the lungs causing serious damage.

Bases, as a class of chemicals, feel slippery or soapy, in fact, soap is made from a mixture of a base (lye) and animal fat. Concentrated **bases** dissolve tissue easily and therefore can cause severe skin damage on contact. Concentrated caustic gases like ammonia vapors can damage the skin, eyes, nose, mouth and lungs. Even dry powder forms of bases can damage you when you inhale them, because they react with moisture in your skin, eyes and respiratory tract.

Cement and mortar are **alkali** compounds in their wet or dry form. As dust and powder, they can cause damage to skin and eyes when they react with moisture in your body. Concrete and mortar can also cause an allergic reaction in people who become sensitive to them. These compounds are abrasive and can damage your skin by the sandpaper-like quality they posses.

Always follow these rules when working with **acids and bases:**

- Know what chemicals you are working with and how strong (concentrated) they are.
- Use Personnel Protective Equipment as required.
- In case of skin or eye contact, flush with cool water for at least 15 minutes but do not rub skin or eyes.
- Always add **acid** to water to prevent splatter.
- Keep **acid and bases** apart, store separately and clean up spills promptly.
- Check with your supervisor if you need more information.

METALS

We don't usually think of chemicals when we talk about metals, but the fact is that every time we weld, braze, torch cut, solder, grind, polish, coat, finish or drill metals we may be producing dust, fumes and vapors containing metal.

The metal in dust, fumes and vapors can easily be deposited in the lungs and then into the blood stream. Although inhaling the dust or fume form of a metal is the most common way for metals to get into the body, you could swallow metal particles or compounds if you, drink, chew gum or eat your lunch in an area where these compounds are present. Some metals like mercury, and certain compounds of lead can be absorbed by your skin.

COMMON CONSTRUCTION METALS

Cadmium

Cadmium and its compounds can be toxic. A condition called metal fume fever, with flu-like symptoms can occur when small doses are inhaled. In larger doses cadmium inhalation can be fatal. Small repetitive doses can cause kidney damage or lead to emphysema. Welding cadmium coated metals is the most common cause of exposure. Adequate ventilation and an approved respirator will protect you.

Nickel

Exposure to metal dust or fumes containing nickel and nickel compounds can inflame and irritate the skin causing an itching rash. Inhalation of nickel compounds has been linked to cancer of the lungs and nasal sinuses.

Lead

Lead exists normally in the body but can easily build to a level that is toxic. Early signs of lead poisoning - fatigue, irritability, headache, cramps, stomach pain, loss of appetite - are likely to be ignored. Continual buildup can damage the nervous system, brain, kidneys and reproductive system. Soldering pipes, casting lead seals and repairing piping are common lead producers; but lead is also found in gasoline, canned food and most city water supplies.

Zinc, Copper, Brass and Magnesium

Fumes, powders and compounds of these metals are sometimes encountered in welding, brazing, cutting and spray metalizing work. Inhalation of these metals can cause metal fume fever, a flu-like condition with coughing, shortness of breath, fatigue, fever, chills, profuse sweating and chest pains.

Following a few simple procedures will protect you from metal exposure:

- Know what is the in the metals you are working with.
- When dust or fumes are produced, use the appropriate respirator properly.
- Always make sure you have plenty of ventilation.

Pay attention to personal hygiene and housekeeping. Before eating, drinking and smoking, wash your hands, and keep your work area separate from your lunch area.

OSHA 1926.59

HAZARD COMMUNICATION STANDARD

The purpose of this standard is to make sure that information on working safely with hazardous chemicals on the jobsite is given to workers.

The standard requires manufacturers and distributors of chemicals to properly label chemical containers and to provide Material Safety Data Sheets to users of their products.

Employers must have a written Hazard Communication (Haz Com) Program, a Chemical Inventory List for each work site, and must train workers about chemicals and make available information on the chemicals in use in their workplaces.

Employers must provide training to workers regarding: the provision of the Hazard Communication Standard, Physical and Chemical Properties in use, Protective Measure for Workers in using these chemicals in normal and non-routine tasks, and appropriate personnel protective equipment, safe work procedures and first aid measures. This training must be provided initially, and when new chemical hazards are brought into the workplace.

The employer must also ensure that all chemical containers are labeled, and employees are trained in the labeling, hazardous warning and monitoring systems in use at the jobsite.

Employees have the right to review the written Hazard Communication Program and Chemical List for their jobsite. Employees can also request a copy of the Material Safety Data Sheet for any chemical they are using. Your foreman will tell you who to talk to to review programs, obtain MSDS's or receive more information.

All employees shall be provided with access to the needed information but each employee is responsible for handling chemicals safely, and using the proper protective equipment and safe work procedure whenever working with chemicals.

CHEMICAL INVENTORY CLASSIFICATION

A **Hazardous chemical** is any chemical that carries a manufacture's warning on the container label such as "Warning, This Product Is Hazardous To Your Health." Or a chemical listed as hazardous on the products Material Safety Data Sheets. When making a hazardous determination, refer to the definition of chemical classified by the HCS as Hazardous.

A **Non-Hazardous chemical** is one that either has no warning language on the label or one that does not that does not meet the criteria for a hazardous chemical under HCS. **If the manufacturer does not provide a warning label on the container or a Material Safety Data Sheet for the product, the employer can treat it as a non-hazardous chemical not subject to the HCS requirement.**

Consumer Product - A chemical defined as a consumer product and regulated under the provisions of the Consumer Product Safety Commission is not included within coverage of hazardous chemicals in the HCS. If you purchase a product in the same packaging and use that product for its intended use in accordance with consumer warning labels, the product is a consumer product and exempt from HCS coverage. However, if you intend to use any consumer product in a manner it was not designed for or in circumstances that a consumer would not be exposed to, such as confined space use, the chemical should be treated as hazardous.

MATERIAL SAFETY DATA SHEETS (MSDS)

USING A MSDS

An MSDS provides information the manufacturer of a chemical considers necessary to determine what chemicals are in a product, and what steps to take to protect yourself when using the product.

Although MSDS's from different sources may look very different, they all contain the same type of information. MSDS's contain a lot of technical language and data, but the information you need to identify, understand, and work safely with a chemical product is fairly easy to find.

MSDS's are divided into sections usually beginning with the chemical and common name of the product. Besides knowing what this product is called, it's important to know who makes it and where to reach the manufacturer. The manufacturer can answer questions about his product and help you if an emergency arises. You will usually find a phone number for the manufacturer in this section.

An important section to look for is usually called "Health Hazards" which tells you how dangerous the product can be, the type of danger it represents, and what happens if you are overexposed to this product.

Equally important is the section that deals with "First Aid". This section will give you some basic steps to take if you or another person are affected by the chemicals in the product.

Another section deals with "Protective Equipment". Here specific recommendations for safety equipment and procedures are listed. This section tells you how to protect yourself from exposure when working with, or near the product.

By taking the time to read the MSDS you will find some important basic information about the chemical(s) you work with including:

- What's it called
- What's in it
- How the chemical may affect you
- What first aid steps to take if exposure occurs
- How to protect yourself and work safely with the chemical.

Other sections of a MSDS will tell you what the chemical looks, smells and feels like; how to safely handle and store the chemical; what happens to the chemical in the event of a fire; and what, if any, exposure limits have been set or recommended for the chemical(s) or product.

More information on MSDS, chemical information references and chemical safety can be obtained by asking your supervisor, or the Safety Department.

Under the provisions of the Hazard Communication Standard, you have the opportunity to review your company's Haz Com program, chemical inventory list and copies of MSDS's for chemicals you are working with.

MATERIAL SAFETY DATA SHEETS (MSDS)

USING A MSDS

An MSDS provides information the manufacturer of a chemical considers necessary to determine what chemicals are in a product, and what steps to take to protect yourself when using the product.

Although MSDS's from different sources may look very different, they all contain the same type of information. MSDS's contain a lot of technical language and data, but the information you need to identify, understand, and work safely with a chemical product is fairly easy to find.

MSDS's are divided into sections usually beginning with the chemical and common name of the product. Besides knowing what this product is called, it's important to know who makes it and where to reach the manufacturer. The manufacturer can answer questions about his product and help you if an emergency arises. You will usually find a phone number for the manufacturer in this section.

An important section to look for is usually called "Health Hazards" which tells you how dangerous the product can be, the type of danger it represents, and what happens if you are overexposed to this product.

Equally important is the section that deals with "First Aid". This section will give you some basic steps to take if you or another person are affected by the chemicals in the product.

Another section deals with "Protective Equipment". Here specific recommendations for safety equipment and procedures are listed. This section tells you how to protect yourself from exposure when working with, or near the product.

By taking the time to read the MSDS you will find some important basic information about the chemical(s) you work with including:

- What's it called
- What's in it
- How the chemical may affect you
- What first aid steps to take if exposure occurs
- How to protect yourself and work safely with the chemical.

Other sections of a MSDS will tell you what the chemical looks, smells and feels like; how to safely handle and store the chemical; what happens to the chemical in the event of a fire; and what, if any, exposure limits have been set or recommended for the chemical(s) or product.

More information on MSDS, chemical information references and chemical safety can be obtained by asking your supervisor, or the Safety Department.

Under the provisions of the Hazard Communication Standard, you have the opportunity to review your company's Haz Com program, chemical inventory list and copies of MSDS's for chemicals you are working with.

CHEMICAL INVENTORY CLASSIFICATION

A **Hazardous chemical** is any chemical that carries a manufacture's warning on the container label such as "Warning, This Product Is Hazardous To Your Health." Or a chemical listed as hazardous on the products Material Safety Data Sheets. When making a hazardous determination, refer to the definition of chemical classified by the HCS as Hazardous.

A **Non-Hazardous chemical** is one that either has no warning language on the label or one that does not that does not meet the criteria for a hazardous chemical under HCS. **If the manufacturer does not provide a warning label on the container or a Material Safety Data Sheet for the product, the employer can treat it as a non-hazardous chemical not subject to the HCS requirement.**

Consumer Product - A chemical defined as a consumer product and regulated under the provisions of the Consumer Product Safety Commission is not included within coverage of hazardous chemicals in the HCS. If you purchase a product in the same packaging and use that product for its intended use in accordance with consumer warning labels, the product is a consumer product and exempt from HCS coverage. However, if you intend to use any consumer product in a manner it was not designed for or in circumstances that a consumer would not be exposed to, such as confined space use, the chemical should be treated as hazardous.

PROJECT CHEMICAL INVENTORY LIST

Project Name:_____

Manfacturer Product Name	Chemical Name	Quantatity On Site	Located On Site	Properly Labeled (Y/N)	MSDS Filed (Y/N)	Classification	Date of List	Listed By

To be filed in the field files at the end of the job

Form #: 309 - 2/96

This Safety And Health Manual Is Not To Be Considered "All Inclusive", Rather A General Guideline. Where Any Portion Of These Standards Are In Conflict With, Or Less Strigent Than, Any Applicable Federal, State Or Local Statutory Safety Requirements, Then Statutory Regulation Takes Precedence.

If There Is An Area That You Consider Unclear, Contact The Safety Department For Assistant.

Hardage Construction Corporation Holds The Right To Modify This Safety Code At Anytime, Without Prior Notification. This Safety And Health Manual Will Be Reviewed Periodically To Ensure Compliance And Effective Safety Control.

Manufacturer Product Name	Chemical Name	Quantity On Site	Location On Site	Properly Labeled (Y/N)	MSDS Filed (Y/N)	Classification	Date Filed	Filed By

Manufacturer Product Name	Chemical Name	Quantity Onsite	Location On Site	Product Labeled (Y/N)	MSDS Filed (Y/N)	Classification	Date Entered	Initials
CAS#74-86-2	Acetylene	2 Bottles	Bldg Interior	Y	Y	Hazardous	1/1/96	RRR
Conrete Mix	Various	25 bags	Storage Yard	Y	Y	Hazardous	2/24/96	RRR
Spray Paint	Various	25 cans	Storage Yard	Y	Y	Hazardous	3/15/96	RRR