EDGERTON Contractors, Inc.
Established 1956
EARTHWORK AND ENVIRONMENTAL SERVICES
6466 South 13th Street • Oak Creek, Wisconsin 53154-1199 • (414) 764-4443 • fax (414) 764-9788

TO: **ALL EMPLOYEES, SUBCONTRACTORS, SUPPLIERS, AND CUSTOMERS OF EDGERTON CONTRACTORS INC./EDGERTON TRUCKING, INC.**

RE: **COMPANY SAFETY POLICY**

Safety in all Edgerton Contractors, Inc./Edgerton Trucking, Inc. operations is a requirement.

To this end, we have formulated this written policy to govern all operations of Edgerton Contractors, Inc./Edgerton Trucking, Inc.

It is a condition of employment with Edgerton Contractors, Inc./Edgerton Trucking, Inc. that all employees must adhere faithfully to the requirements of this policy and the safety rules, instructions, and procedures issued in conjunction with the policy. Failure to do so will result in disciplinary action as outlined in the attached policy.

It is a condition of all subcontracts and purchase orders issued by Edgerton Contractors, Inc./Edgerton Trucking, Inc. that this policy and the safety rules, instruction and procedures issued in conjunction with this policy, as well as applicable State, Federal, and local codes and regulations be adhered to. Failure to comply is a breach of contract terms.

All visitors to Edgerton Contractors, Inc./Edgerton Trucking, Inc. operations including, but not limited to, suppliers, owners representatives, agents of the architect or engineer, regulatory authorities, and insurance company representatives, shall be required to follow all safety rules and regulations in effect during his/her visit.

Edgerton Contractors Inc./Edgerton Trucking, Inc. will make an effort to insure that the operations of other contractors not under our control do not endanger the safety of our employees. To this end, all employees are required to report hazardous activities of other employers to appropriate Edgerton Contractors Inc./Edgerton Trucking, Inc. personnel.

The safety manager and supervisors have the full backing of company management to enforce the provisions of this policy as it relates to responsibilities assigned to them.

Edgerton Contractors Inc./Edgerton Trucking, Inc.

Steve Nachreiner
President

Edgerton Contractors, Inc. /Edgerton Trucking, Inc. considers our employees to be our most valuable resource. We, therefore, believe a formal safety program is for your protection and believe accidents can be minimized if this program is used by all employees.

Edgerton Contractors, Inc./Edgerton Trucking, Inc. wants to make all jobsites a safe and healthful work place for our employees.

Total management is involved in job safety and accident prevention. All in-office management and field supervisors are responsible to see that these procedures are enforced at all times.

The main goal of this program is to ensure safe working conditions on the jobsites and lessen the possibility of injury to all workers.

TAKE NO UNNECESSARY CHANCES; MAKE SAFETY A DAILY PART OF YOUR JOB!

O.S.H.A. INSPECTION PROTOCOL

It is important for all employees to adhere to the following protocol in the event of an O.S.H.A. inspection:

- Treat the inspector politely and courteously.
- Inform the O.S.H.A. inspector that all inspections must be conducted with either Tom Wolf or Steve Nachreiner present. Tell the inspector that you must inform the office, and that either Tom or Steve will be on the jobsite within 24 hours of notification.
- Inform the inspector that it is not our intention to refuse his/her entry; rather it is our company policy that the above referenced people be present for these inspections.

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. GENERAL POLICY STATEMENT

It is the policy of Edgerton Contractors, Inc./Edgerton Trucking, Inc. to provide a safe and healthful place of employment for all employees**.** It is the purpose of this policy to:

1. Abide by all Federal, State and local government regulations as they pertain to construction.
2. Apply good sense and safe practices as dictated by locations, conditions and circumstances to all jobs.
3. Exercise good judgment in the application of this policy.

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. MANAGEMENT SHALL:

1. Establish rules and programs designed to promote safety.
2. Make known to all employees the rules established.
3. Require all subcontractors as a matter of contract to follow established safety rules.
4. Encourage all prime contractors to work safely.
5. Record any/all instances of violations and investigate any/all accidents.
6. Discipline any employee willfully disregarding this policy.
7. Provide personal protective equipment (PPE) for employees where required.
8. Inform employees of changes in safety rules.
9. Appoint a safety manager with full enforcement authority over safety matters.
10 Conduct safety inspections of all jobsites and maintain records.
11. Provide all supervisors with copies of appropriate rules and regulations.

EDGERTON CONTRACTORS, INC. /EDGERTON TRUCKING, INC. SUPERVIORS SHALL:

1. Carry out this safety policy.
2. Be aware of all safety requirements and safe working practices.
3. Report any/all injuries and safety violations.
4. Instruct new employees, and existing employees performing new tasks, in safe working practices.
5. Make sure protective equipment is available and used.
6. Secure prompt medical attention for any injured employees.
7. Make sure all work is performed in a safe manner and no unsafe conditions or equipment are present.
8. Provide his/her crew with proper instruction on safety requirements.

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. WORKERS SHALL:

1. Work safely.
2. Request help when unsure how to perform any task safely.
3. Report any/all unsafe acts to supervision.
4. Work in such a manner as to insure his/her safety as well as that of co-workers.

5. Avail himself/herself of Edgerton Contractors Inc./Edgerton Trucking, Inc. and industry sponsored safety programs.
6. Use and maintain all safety devices provided by Edgerton Contractors, Inc./Edgerton Trucking, Inc.
7. Maintain and properly use all tools under his/her control.
8. Follow all safety rules.
9. Provide fellow employees help with safety requirements.
10. Report for work in clothing suitable for work and in such a manner that clothes and jewelry worn will not constitute a safety hazard.

SUBCONTRACTORS AND SUPPLIERS OF EDGERTON CONTRACTORS, INC. /EDGERTON TRUCKING, INC. SHALL:

1. Abide by all safety rules of Edgerton Contractors, Inc./Edgerton Trucking, Inc., the jobsite owner, and other contractors.
2. Notify all other contractors when actions or activities undertaken by them could affect health or safety of other workers.
3. Check in with jobsite supervision before entering jobsite.
4. Inform Edgerton Contractors, Inc./Edgerton Trucking, Inc. of any/all injuries to workers.
5. Report to Edgerton Contractors, Inc./Edgerton Trucking, Inc. any unsafe conditions that come to his/her attention.

ARCHITECTS, OWNERS AND VISITORS ON EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. PROJECTS SHALL:

1. Abide by all safety rules.
2. Check in with site supervision so personal protective equipment may be provided such as hard hats, or eye protection, and respirator protection, if needed.
3. Refrain from entering construction areas without contacting employees working in those areas.

ALL PERSONNEL SHALL:

1. Strive to make all operations safe.
2. Maintain mental and physical health conducive to working safely.
3. Keep all work areas clean and free of debris.
4. Assess the result of his/her actions on the entire workplace.
5. Replace or repair safety precautions removed or altered before leaving work area. Unsafe conditions will not be left to imperil others.
6. Abide by the safety rules and regulations of jobsite owners.
7. Work in strict conformance with OSHA regulations.
8. Report promptly to supervision any/all accidents or injuries observed, whether involving Edgerton Contractors Inc./Edgerton Trucking, Inc. personnel or not.

EDGERTON CONTRACTORS, INC.
EMPLOYEE DRUG AND ALCOHOL TESTING PROGRAM

I. DRUG AND ALCOHOL TESTING POLICY STATEMENT

Edgerton Contractors, Inc. (the "Company") recognizes the significant potential problems caused by drug and alcohol use in the workplace and is committed to maintaining a drug and alcohol-free workforce. The use of controlled substances or alcohol jeopardizes the safety and productivity of the individual employee as well as the safety and well-being of others.

Accordingly, the Company adopts the following Drug And Alcohol Testing Program.

II. DRUG AND ALCOHOL TESTING PROGRAM

A. Prohibited Drug And Alcohol Use

The goals of the Company's policy and the testing of employees is to insure a drug and alcohol free work environment, and to reduce and help eliminate drug and alcohol related accidents, injuries, fatalities and property damage.

The following conduct is prohibited:

1) Employees are prohibited from using, being under the influence of, or possessing illegal drugs.

2) Employees are prohibited from using or being under the influence of legal drugs that are being used illegally.

3) Employees are prohibited from buying, selling, soliciting to buy or sell, transport, or possess illegal drugs while on company time or property, or while at Company sponsored functions.

4) Employees are prohibited from using alcohol prior to six (6) hours of performing work duties.

5) Employees are prohibited from using or being under the influence of alcohol at any time while on duty, eight (8) hours post-accident, or until tested.

6) Employees are prohibited from possessing any amount or type of alcohol (including medications, or over-the-counter remedies containing alcohol) while on duty.

7) Testing positive for drugs and/or alcohol.

8) Failing to stay in contact with the company and its Medical Review Officer (MRO) while awaiting test results.

An employee who violates these prohibitions will be subject to disciplinary action by the Company up to and including discharge.

B. Reasonable Cause Testing.

In cases in which an employee is acting in an abnormal manner or a supervisor has reasonable cause to believe that the employee is under the influence of a controlled substance and/or alcohol, the

Company shall require the employee to go directly to a collection site to provide a urine and/or blood and/or breath specimen for laboratory testing. In such a case, the employee will be transported to the collection site by a Company representative.

Reasonable cause means suspicion based on specific personal observations that the Company representative can describe concerning the appearance, behavior, speech or breath odor of the employee. The supervisor will make a written statement of these observations within twenty-four (24) hours of the observed behavior.

C. Post-Accident Testing.

An employee shall provide a urine or blood and/or breath specimen to be tested for the use of controlled substances and/or alcohol as soon as possible, but not later than eight (8) hours after a reportable accident occurring while on Company time or business or on any work site.

For the purposes of this Section, a "reportable accident" means an accident resulting in:

1) the death of a human being;

2) bodily injury to a person who, as a result of the injury, immediately receives medical treatment away from the scene of the accident; or

3) total damage to all property aggregating $500.00 or more based upon actual costs of reliable estimates.

D. Chain Of Possession Procedures.

All chain of possession procedures utilized under this Program for the testing of controlled substances and/or alcohol shall be the same as those approved by the Substance Abuse and Mental Health Service Administration ("SAMHSA"), as they are now in effect or as hereinafter amended.

E. Medical Review Officer.

The Company has retained a qualified medical review officer to receive test results from a laboratory and to carry out all actions necessary to confirm positive test results.

F. Breath Alcohol Technician.

The Company has retained a qualified breath alcohol technician to conduct evidentiary breath alcohol tests.

G. Laboratory Accreditation.

All laboratories used to perform urine and/or blood testing pursuant to this Program will be accredited by the Substance Abuse and Mental Health Services Administration ("SAMHSA").

H. Laboratory Testing Methodology.

1. Drug Screening.

Drug tests will be conducted to screen the presence of the following drugs and their metabolites:

a) Marijuana

b) Cocaine

c) Opiates

d) Amphetamines

e) Phencyclidine

2. Prescribed Medication.

An individual will be allowed to list any prescribed medication that he or she may be taking or may have recently taken on a form provided to the individual at the collection site. The individual may also be required to identify the physician prescribing the medication and to authorize the Company's medical review officer to communicate with that physician about the medication, its possible side effects, the condition requiring the taking of the medication and their relationship to the individual's ability to safely perform his/her job. The employee will have the opportunity to discuss the use of the medication with the Company's medical review officer.

In the event it is determined by the MRO that an employee is taking or is under the influence of a prescribed medication that will reasonably impair the employee's ability to safely and adequately perform his or her job, the employee may be placed on a medical leave of absence until the condition requiring the taking of the medication is resolved or the employee is no longer taking the medication.

3. Specimen Testing (Urine/Blood/Breath).

All specimen testing procedures will be performed in accordance with applicable Substance Abuse and Mental Health Service Administration regulations. Copies are on file and available for inspection by employees.

I. Disciplinary Action Based On Positive Test Results Up To And Including Discharge.

An employee who tests positive for the use of a controlled substance and/or alcohol, as reported to the Company by the medical review officer, shall be unqualified to work for the Company for the remainder of the employee's shift. Further, a positive test result shall be grounds for the immediate discipline of the employee, up to and including discharge.

A positive test result is considered proof of the employee's willful and intentional misconduct.

J. Disciplinary Action Based On Refusal To Submit To Testing.

An employee who refuses to be tested under any of the provisions of this Drug And Alcohol Testing Program shall not be permitted to work for the Company. Such refusal shall be treated as a positive test and shall result in immediate discharge.

APPENDIX A

ACKNOWLEDGMENT OF RECEIPT OF DRUG AND ALCOHOL TESTING PROGRAM AND AGREEMENT TO ABIDE BY PROGRAM

I, _____, hereby acknowledge that I have received a copy of the Company's Drug And Alcohol Testing Program ("Program").

In conjunction with my receiving a copy of the Program, I further acknowledge the following:

1. I have read the Program and fully understand the terms contained therein and the consequences for violating any term of the Program.

2. I understand that my compliance with all terms of the Program is a condition of my employment with the Company, and I agree to abide by all terms of the Program.

3. As applicable, if a post-accident drug and/or alcohol test is required under this Program and I am seriously injured and unable to provide a specimen at the time of the accident, then this Acknowledgment shall be considered my authorization for the Company and/or the medical review officer to obtain hospital reports and other documents which would indicate whether there were any controlled substances and/or alcohol in my system.

4. I authorize the collection site, laboratory and/or medical review officer retained by the Company to perform any and all functions which those entities and/or individuals may be required to perform pursuant to this Program or applicable regulations. Such authorization shall include, but is not limited to, the release of test result information to the Company, verification of the use of prescribed medications, obtaining information from the employee's physician, hospital, dentist or pharmacist and the reporting of negative test results with a qualifying statement in cases wherein an employee may be taking a legally-prescribed Schedule II drug.

5. I hereby release and hold harmless the Company and its employees and agents from any liability whatsoever arising from the Program.

_____ _____

Employee Signature Date

WITNESSED BY:

_____

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING INC. PROBLEM SOLVING PROCEDURE

To have an effective safety program, we will communicate both down and up corporate structure.

When a safety problem arises, everyone, even the least senior and experienced employees, have a responsibility to co-workers and to Edgerton Contractors Inc./Edgerton Trucking, Inc. to report or correct any hazardous conditions found. Every employee's concerns will be heard and each situation will be corrected or a valid explanation given.

The following is Edgerton Contractors, Inc./Edgerton Trucking, Inc.'s procedure for solving safety problems.

SAFETY PROBLEM SOLVING

It is the intent of Edgerton Contractors, Inc./Edgerton Trucking, Inc. to provide a safe workplace for all employees. Supervision personnel have been instructed to watch for and correct any/all unsafe conditions immediately. Construction sites are complex and items are easily overlooked. It is important that all employees be on the lookout for unsafe conditions. If you observe a condition that is unsafe, the following actions are to be taken:

1. If possible, correct the condition immediately. Many safety hazards, like a piece of missing guardrail, are easy to correct.

2. If you are not able to take corrective action, report the condition to your immediate supervisor for correction.

3. All Edgerton Contractors Inc./Edgerton Trucking, Inc. employees with any supervisory responsibility have been instructed to take corrective action or contact someone who can when a safety concern is raised. In the event corrective action is not begun in a reasonable length of time, the employee is requested to contact the corporate safety manager, Julie Cox, who can be reached at 414-349-1533. If the corporate safety manager is unavailable, please contact Steve Nachreiner, President, at 414-764-4443.

We appreciate your cooperation in reporting any/all safety problems. If we all work together and safely, we can all go home at the end of each day.

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. DISCIPLINARY PROCEDURES

The normal disciplinary policy of Edgerton Contractors, Inc./Edgerton Trucking, Inc. is as follows:

1. For minor first instance violations:

   Immediate correction if applicable.
   Verbal warning (documented in the supervisor's log)

2. For minor second instance violations of the same safety requirement:

   Immediate correction if applicable
   Written warning with a copy to the safety manager

3. For minor third violation of the same safety requirement:

   Immediate dismissal

4. For more than three verbal warnings for minor violations of different safety requirements:

   Immediate correction
   Written warning with a copy to the safety manager and/or project manager

5. For more than two written warnings for minor violations of different safety requirements:

   Immediate dismissal

Nothing in this policy prevents the immediate dismissal or removal from the jobsite of any employee or subcontractor whose conduct is a serious violation of the safety requirements and constitutes a grave danger to him/her, co-workers, property, equipment, or any other workers on the jobsite.

EDGERTON CONTRACTORS, INC./EDGERTON TRUCKING, INC. GENERAL WORK RULES

THIS IS NOT A COMPLETE LIST OF ALL APPLICABLE SAFETY RULES. IT IS INTENDED TO PROVIDE GENERAL GUIDANCE AND TO BE USED WHERE MORE SPECIFIC WORK PRACTICE GUIDES HAVE NOT BEEN ISSUED

ABRASIVE GRINDING

All abrasive wheel bench and stand grinders will be provided with safety guards strong enough to withstand effects of a bursting wheel and covering spindle ends, nut and flange projections. Floor and bench-mounted grinders shall be equipped with work rest adjustable to maintain a clearance not to exceed 1/8-inch between work rest and wheel surface. Closely inspect and ring-test abrasive wheels before mounting.

AIR TOOLS

Pneumatic power tools must be positively secured to the hose to prevent accidental disconnection. Safety clips or retainers must be securely installed and maintained on pneumatic impact tools to prevent attachments from becoming accidentally disconnected. The manufacturer's safe operating pressure for all fittings may not be exceeded. All hoses exceeding 1/2-inch (inside diameter) must have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

ALCOHOL AND DRUG USE

Use of alcohol, drugs, or other controlled substances, on Edgerton Contractors Inc./Edgerton Trucking, Inc. premises and/or jobsites is prohibited. Reporting to work under influence of alcohol or other drugs is prohibited. A complete explanation of our drug and alcohol policy can be found in the Edgerton Contractors Inc./Edgerton Trucking, Inc.'s drug and alcohol policy.

ASBESTOS

If you encounter material that may possibly contain asbestos, stop work immediately and notify your supervisor. The general policy of Edgerton Contractors Inc./Edgerton Trucking, Inc. is to have abatement work done by a company that specializes in asbestos work. Whenever the potential of asbestos presence exists, exposure monitoring must be performed to determine airborne concentrations of asbestos. Employees must be ensured that there is no exposure to an airborne concentration of asbestos in excess of 0.1 f/cc as an 8-hour time-weighted average. In addition, no employee may be exposed to an airborne concentration of asbestos in excess of 1 f/cc as averaged over a sampling period of 30 minutes. Respirators must be used during (1) all Class I asbestos jobs; (2) all Class II work where an asbestos-containing material is not removed, left substantially intact; (3) all Class II and III work not using wet methods; (4) all Class II and III work without a negative exposure assessment; (5) all Class III jobs where thermal system insulation or surfacing asbestos-containing or presumed asbestos-containing material is cut, abraded, or broken; (6) all Class IV work within a regulated area where respirators are required; (7) all work where employees are exposed above the PEL or STEL; and (8) in emergencies. 1926.1101(h)(l)(i) thru (viii) Use of protective clothing such as coveralls, head coverings, gloves, and foot coverings is required for any/all of the following: (1) exposure to airborne asbestos exceeding PEL or STEL, (2) work without a negative exposure assessment, (3) any employee performing Class I work involving removal of over 25 linear or 10 square feet of thermal system insulation or surfacing asbestos-containing or presumed asbestos-containing materials. Medical surveillance will be provided for employees who, for a combined total of 30 or more days per year, engage in Class I, II, or III work, or are exposed at or above PEL or STEL, or who wear negative-pressure respirators.

PROTECTIVE CLOTHING

Proper clothing will consist of a minimum of sturdy work boots, long leg pants (free of holes), and a work shirt, with sleeves. Employees working on jobsites with mobile equipment shall wear reflective, high-visibility, traffic safety vests, OSHA-approved hard hats, ANSI-approved safety glasses, and safety-toe boots or shoes (steel-toe or composite). Employees reporting to work not dressed properly may be sent home.

COMPRESSED AIR
Compressed air used for cleaning purposes will be reduced to less than 30 psi and then only with effective chip guarding and proper personal protective equipment. This requirement does not apply to concrete forms, mill scale, or similar cleaning operations.

COMPRESSED GAS CYLINDERS
Valve protection caps will be in place and secured when compressed gas cylinders are transported, moved, or stored. Cylinder valves will be closed when work is finished and when cylinders are empty or are moved. Compressed gas cylinders will be secured in an upright position at all times, except if necessary for short periods of time when cylinders are actually being hoisted or carried. Cylinders will be kept far enough away from the actual welding or cutting operations so that sparks, hot slag, or flame will not reach them. When this is impractical, fire-resistant shields will be provided. Cylinders will be placed where they cannot become part of an electrical circuit. Oxygen and fuel gas regulators will be in proper working order while in use.

CONCRETE CONSTRUCTION
No construction load(s) may be placed on a concrete structure unless it has been determined the structure, or portion of the structure, is capable of supporting the load(s). All protruding reinforced steel onto and into which employees could fall, will be guarded to eliminate the hazard of impalement. No employee(s) will be permitted to work under concrete buckets while buckets are being elevated or lowered into position. To the extent practical, elevated concrete buckets will be routed so no employee(s), or fewest number of employees is exposed to falling concrete buckets. Formwork will be designed, fabricated, erected, supported, braced, and maintained so it is capable of supporting, without failure, all vertical and lateral loads that may reasonably be anticipated to be applied. Forms and shores (except those used for slabs on grade and slip forms) may not be removed until the concrete has gained sufficient strength to support its weight and superimposed loads. Such determination will be based on compliance with one of the following: (1) the plans and specifications stipulate conditions for removal of forms and shores, (2) such conditions have been followed, (3) the concrete has been properly tested with an appropriate ASTM standard test method designed to indicate concrete compressive strength, or (4) test results indicate concrete has gained sufficient strength to support its weight and superimposed loads.

CONFINED SPACES
All employees required to enter into confined or enclosed spaces will be instructed as to nature of hazards involved, necessary precautions to be taken including ventilation and air monitoring, and use of protective and emergency equipment. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 (four) feet deep such as pits tubs, vaults, and vessels.

CRANES AND DERRICKS
Manufacturer's specifications and limitations will be followed. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions will be conspicuously posted on all equipment. Instructions or warnings will be visible from the operator's station. Inspect all equipment before and during each use. Correct all deficiencies before further use. Accessible areas within the swing radius of the rear of the rotating superstructure will be properly barricaded to prevent employees from being struck or crushed by the crane. Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of, or an attachment to equipment or machinery have been erected to prevent physical contact, no part of a crane or its load will be operated within 10 feet of a line rated 50kV or below; 10 feet plus 0.4 inches for each kV over 50 kV for lines rated over 50 kV, or twice the length of line insulator, but never less than 10 feet. An annual inspection of the hoisting machinery will be made by a competent person. Records will be kept of the dates and results of each inspection. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when erection, use, and dismantling of conventional means of reaching worksite would be more hazardous or is not possible because of structural design or worksite conditions. Crane supported work platforms will be used only in strict compliance with 1926.550(g).

DISPOSAL CHUTES
Whenever materials are dropped more than 20 feet to the exterior of a building, an enclosed chute will be used. When debris is dropped through a floor without use of chutes, the area where material falls will be enclosed with barricades not less than 42 inches high and at least six (6) feet back from projected edges of the opening above. Danger/warning signs will be posted at each level.

DRINKING WATER
An adequate supply of potable water will be provided. Portable drinking water containers will be capable of being tightly closed and equipped with a tap. Using a common drinking cup is prohibited. Where disposable cups are supplied, both a sanitary container for unused cups and a receptacle for used cups will be provided.

ELECTRICAL INSTALLATIONS
Edgerton Contractors Inc./Edgerton Trucking, Inc. will provide either ground-fault circuit interrupters (GFCIs) or an assured equipment grounding conductor program to protect employees from ground-fault hazards at construction sites. All 120-volt, single-phase, 15-ampere and 20-ampere receptacles, that are not part of the permanent wiring, must be protected by GFCIs. Receptacles on smaller generators are exempt under certain conditions. An assured equipment grounding conductor program covering extension cords, receptacles, and cord- and plug-connected equipment may be implemented in some circumstances. The program must include the following: a written description of the program, at least one (1) competent person to implement the program, daily visual inspections of extension cords, and cord and plug-connected equipment for defects. Equipment found damaged or defective will not be used until repaired. Continuity tests of equipment grounding conductors, receptacles, extension cords, and cord and plug-connected equipment must be conducted. These tests must generally be done every three (3) months. Lamps for general illumination must be protected from breakage, and metal shell sockets must be grounded. Temporary lights must not be suspended by the cords, unless they are so designed. Portable lighting used in wet or conducive locations, such as tanks or boilers, must be operated at no more than 12 volts or must be protected by GFCIs. Extension cords must be of three-wire type. Extension cords and flexible cords used with temporary and portable lights must be designed for hard or extra hard usage (for example, types S, ST, and SO).

ELECTRICAL WORK PRACTICES
Employees may not work near live parts of electrical circuits, unless protected by one of the following means: de-energizing and grounding of parts, guarding the part by insulation, or any other effective means. In work areas where the exact location of underground electrical power lines is unknown, employees using jack hammers, bars, or other hand tools that may contact lines, must be protected by insulated gloves, aprons, or other protective clothing that will provide equivalent electrical protection. Barriers or other means of guarding must be used to ensure that the work space for electrical equipment will not be used as a passageway during periods when energized parts of equipment are exposed. Worn or frayed electrical cords or cables must not be used. Extension cords must not be fastened with staples, hung from nails, or suspended by wire. Flexible cords must be connected to devices and fittings so strain relief is provided which will prevent pulling from being directly transmitted to joints or terminal screws. Equipment or circuits that are de-energized must be rendered inoperative, and the lockout/tagout procedure must be followed for all points where equipment or circuits could be energized.

EXCAVATIONS – GENERAL REQUIREMENTS
Following is the complete OSHA standard (29 CFR 1926, Subpart P) regarding excavation. In addition, please note that according to Wisconsin State Statutes 182.0175, excavators are required to maintain a minimum clearance of 18 inches between a marked and unexposed utility and the cutting edge or point of any power-operated excavating or earth-moving equipment.

If excavation is required within 18 inches of any markings, the excavation must be performed very carefully with hand-digging tools.

If the utility is exposed, the excavator must reduce the clearance to two times the known limit of control of the cutting edge or point of the equipment, or 12 inches, whichever is greater.

1926.650(a)

Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

1926.650(b)

Definitions applicable to this subpart.

"Accepted engineering practices" means those requirements which are compatible with standards of practice required by a registered professional engineer.

"Aluminum Hydraulic Shoring" means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

"Bell-bottom pier hole" means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

"Benching (Benching system)" means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

"Cave-in" means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

"Cross braces" mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

"Excavation" means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

"Faces" or "sides" means the vertical or inclined earth surfaces formed as a result of excavation work.

"Failure" means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

"Hazardous atmosphere" means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

"Kickout" means the accidental release or failure of a cross brace.

"Protective system" means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

"Ramp" means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

"Registered Professional Engineer" means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

"Sheeting" means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

"Shield (Shield system)" means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

"Shoring (Shoring system)" means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

"Sides". See "Faces."

"Sloping (Sloping system)" means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

"Stable rock" means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

"Structural ramp" means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

"Support system" means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

"Tabulated data" means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

"Trench (Trench excavation)" means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

"Trench box." See "Shield.

"Trench shield." See "Shield."

"Uprights" means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

"Wales" means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

1926.651(a)

Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

1926.651(b)

Underground installations.

1926.651(b)(1)

The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

1926.651(b)(2)

Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

1926.651(b)(3)

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

1926.651(b)(4)

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

1926.651(c)

Access and egress

1926.651(c)(1)

Structural ramps

1926.651(c)(1)(i)

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

1926.651(c)(1)(ii)

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

1926.651(c)(1)(iii)

Structural members used for ramps and runways shall be of uniform thickness.

1926.651(c)(1)(iv)

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

1926.651(c)(1)(v)

Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments o the top surface to prevent slipping.

1926.651(c)(2)

Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

1926.651(d)

Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

1926.651(e)

Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

1926.651(f)

Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

1926.651(g)

Hazardous atmospheres -

1926.651(g)(1)

Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

1926.651(g)(1)(i)

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

1926.651(g)(1)(ii)

Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

1926.651(g)(1)(iii)

Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

1926.651(g)(1)(iv)

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

1926.651(g)(2)

Emergency rescue equipment.

1926.651(g)(2)(i)

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

1926.651(g)(2)(ii)

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

1926.651(h)

Protection from hazards associated with water accumulation.

1926.651(h)(1)

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

1926.651(h)(2)

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

1926.651(h)(3)

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

1926.651(i)

Stability of adjacent structures.

1926.651(i)(1)

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

1926.651(i)(2)

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

1926.651(i)(2)(i)

A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

1926.651(i)(2)(ii)

The excavation is in stable rock; or

1926.651(i)(2)(iii)

A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

1926.651(i)(2)(iv)

A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

1926.651(i)(3)

Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

1926.651(j)

Protection of employees from loose rock or soil.

1926.651(j)(1)

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

1926.651(j)(2)

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

1926.651(k)

Inspections.

1926.651(k)(1)

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

1926.651(k)(2)

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

1926.651(l)

Fall protection.

1926.651(l)(1)

Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

1926.652(a)

Protection of employees in excavations.

1926.652(a)(1)

Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

1926.652(a)(1)(i)

Excavations are made entirely in stable rock; or

1926.652(a)(1)(ii)

Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

1926.652(a)(2)

Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

1926.652(b)

Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3); or, in the alternative, paragraph (b)(4), as follows:

1926.652(b)(1)

Option (1) - Allowable configurations and slopes.

1926.652(b)(1)(i)

Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

1926.652(b)(1)(ii)

Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

1926.652(b)(2)

Option (2) - Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

1926.652(b)(3)

Option (3) - Designs using other tabulated data.

1926.652(b)(3)(i)

Designs of sloping or benching systems shall be selected from and in accordance with tabulated data, such as tables and charts.

1926.652(b)(3)(ii)

The tabulated data shall be in written form and shall include all of the following:

1926.652(b)(3)(ii)(A)

Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

1926.652(b)(3)(ii)(B)

Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe

1926.652(b)(3)(ii)(C)

Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

1926.652(b)(3)(iii)

At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

1926.652(b)(4)

Option (4) - Design by a registered professional engineer.

1926.652(b)(4)(i)

Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

1926.652(b)(4)(ii)

Designs shall be in written form and shall include at least the following:

1926.652(b)(4)(ii)(A)

The magnitude of the slopes that were determined to be safe for the particular project;

1926.652(b)(4)(ii)(B)

The configurations that were determined to be safe for the particular project;

1926.652(b)(4)(ii)(C)

The identity of the registered professional engineer approving the design.

1926.652(b)(4)(iii)

At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

1926.652(c)

Design of support systems, shield systems, and other protective systems. Designs of support systems, shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, i the alternative, paragraph (c)(4) as follows:

1926.652(c)(1)

Option (1) - Designs using appendices A, C and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

1926.652(c)(2)

Option (2) - Designs Using Manufacturer's Tabulated Data.
1926.652(c)(2)(i)

Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

1926.652(c)(2)(ii)

Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

1926.652(c)(2)(iii)

Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

1926.652(c)(3)

Option (3) - Designs using other tabulated data.

1926.652(c)(3)(i)

Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

1926.652(c)(3)(ii)

The tabulated data shall be in written form and include all of the following:

1926.652(c)(3)(ii)(A)
Identification of the parameters that affect the selection of a protective system drawn from such data

1926.652(c)(3)(ii)(B)

Identification of the limits of use of the data

1926.652(c)(3)(ii)(C)

Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

1926.652(c)(3)(iii)

At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

1926.652(c)(4)

Option (4) - Design by a registered professional engineer.

1926.652(c)(4)(i)

Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

1926.652(c)(4)(ii)

Designs shall be in written form and shall include the following:

1926.652(c)(4)(ii)(A)

A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

1926.652(c)(4)(ii)(B)

The identify of the registered professional engineer approving the design.

1926.652(c)(4)(iii)

At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

1926.652(d)

Materials and equipment.

1926.652(d)(1)

Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

1926.652(d)(2)

Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

1926.652(d)(3)

When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

1926.652(e)

Installation and removal of support -

1926.652(e)(1)

General.

1926.652(e)(1)(i)

Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

1926.652(e)(1)(ii)

Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

1926.652(e)(1)(iii)

Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

1926.652(e)(1)(iv)

Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

1926.652(e)(1)(v)

Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

1926.652(e)(1)(vi)

Backfilling shall progress together with the removal of support systems from excavations.

1926.652(e)(2)

Additional requirements for support systems for trench excavations.

1926.652(e)(2)(i)

Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

1926.652(e)(2)(ii)

Installation of a support system shall be closely coordinated with the excavation of trenches.

1926.652(f)

Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

1926.652(g)

Shield systems

1926.652(g)(1)

General.

1926.652(g)(1)(i)

Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

1926.652(g)(1)(ii)

Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

1926.652(g)(1)(iii)

Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

1926.652(g)(1)(iv)

Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

1926.652(g)(2)

Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

1926 SUBPART P APPENDIX A – SOIL CLASSIFICATION

(a) Scope and application. (1) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in 1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in 1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) Definitions. The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and the National Bureau of Standards Report BSS-121.

“Cemented soil” means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

“Cohesive soil” means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical side slopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

“Dry soil” means soil that does not exhibit visible signs of moisture content.

“Fissured” means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

“Granular soil” means gravel, sand, or silt (coarse grained soil) with little or not clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

“Layered system” means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

“Moist soil” means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.
“Plastic” means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

“Saturated soil” means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket Penetrometer or sheer vane.

“Soil classification system” means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

“Stable rock” means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

“Submerged soil” means soil which is under water or is free seeping.

“Type A” means cohesive soils with and unconfined, compressive strength of 1.5 tons per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam, and in some cases, silty clay loam and sandy clay loam. Cemented soils, such as caliche and hardpan, are also considered Type A. However, no soil is Type A if:

(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.

“Type B” means:

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam.
(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
(iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
(v) Dry rock that is not stable; or
(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H;1V), but only if the material would otherwise be classified as Type B.

“Type C” means:

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less: or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered, system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

“Unconfined compressive strength” means that load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket Penetrometer, by thumb penetration tests, and other methods.

“Wet soil” means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) Requirements – (1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C, in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(3) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) Acceptable visual and manual tests. (1) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material. This material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps, is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observed the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8 inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50mm) length of 1/8 inch thread can be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up

into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand, or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 – "Standard Recommended Practice for Description of Soils (Visual – Manual Procedure)".) Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket Penetrometer or by using a hand-operated Shearvane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (.54 cm) an six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

1926 SUBPART P APPENDIX B – SLOPING AND BENCHING

(a) Scope and application. This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) Definitions.

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) **Requirements** -- (1) **Soil classification**. Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) **Maximum allowable slope**. The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) **Actual slope**. (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least ½ horizontal to one vertical (½H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(i).

(4) **Configurations**. Configurations of sloping and benching systems shall be in accordance with Figure B-1.

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 (90º)
TYPE A (2)	3/4:1 (53º)
TYPE B	1:1 (45º)
TYPE C	1 ½:1 (34º)

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

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

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

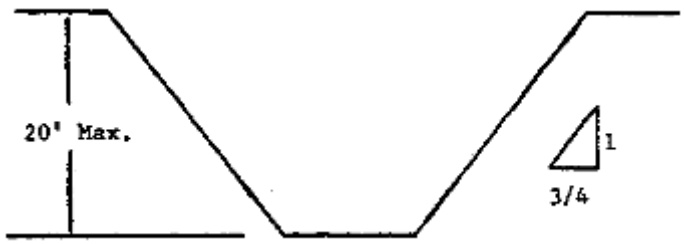
Figure B-1

Slope Configurations

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

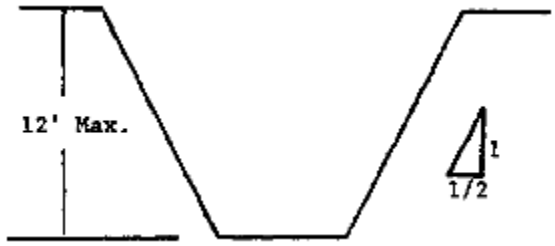
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



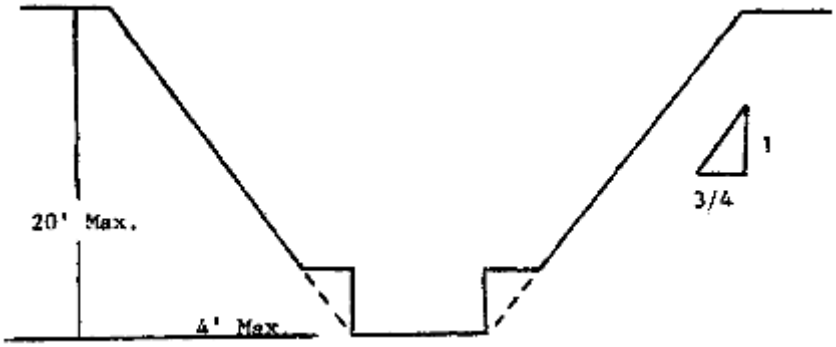
SIMPLE SLOPE -- GENERAL

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 ½:1.

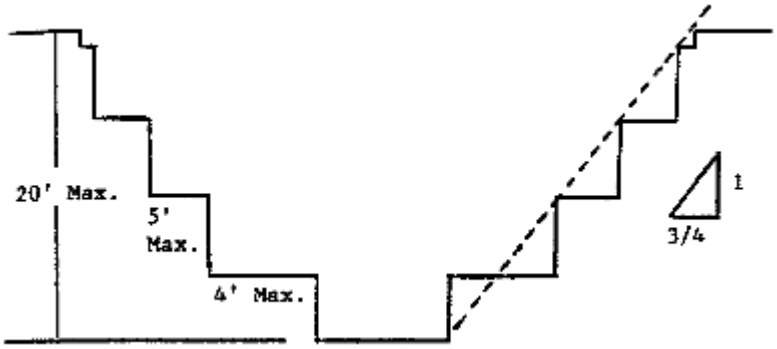


SIMPLE SLOPE -- SHORT TERM

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:

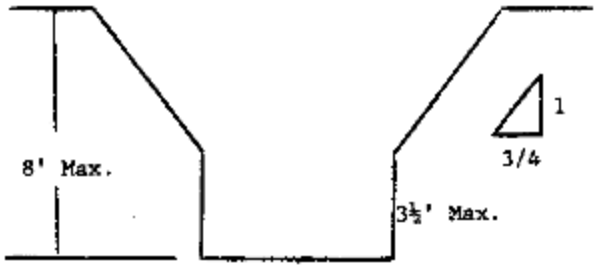


SIMPLE BENCH



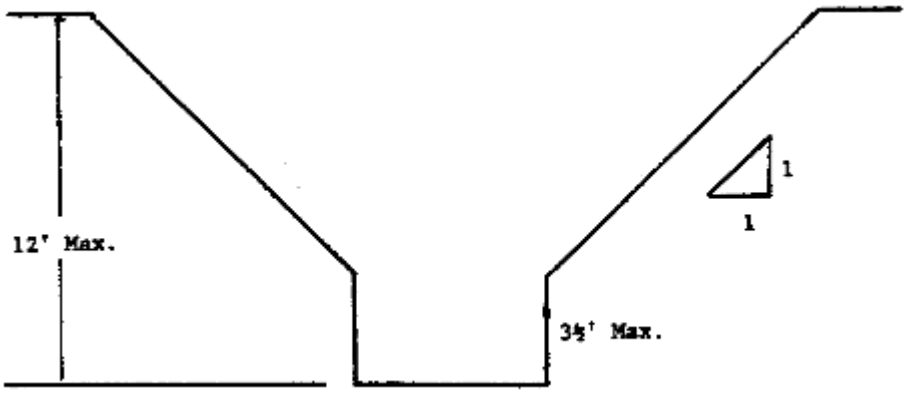
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



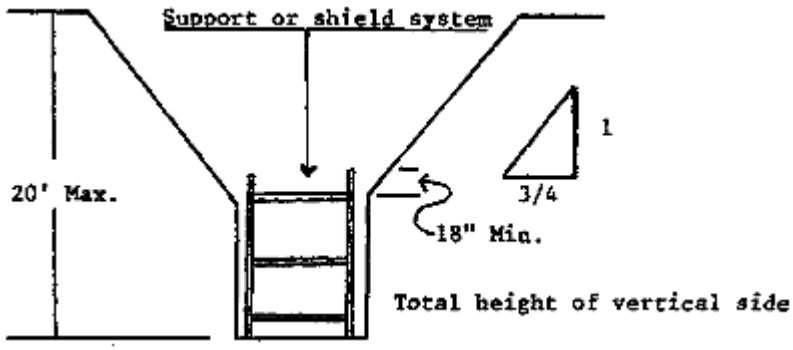
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ 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 ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

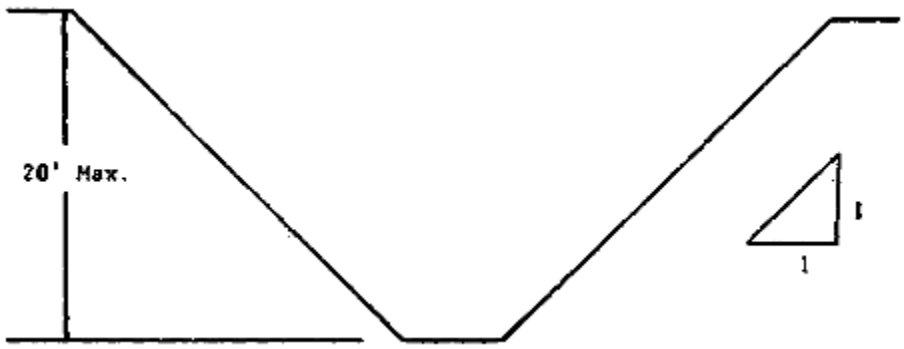


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

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

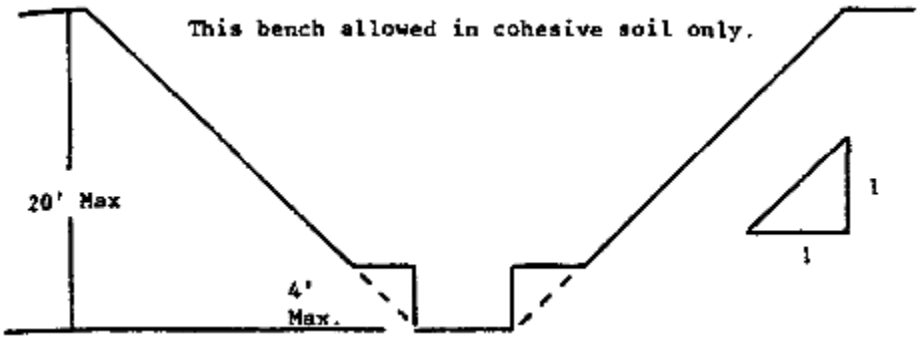
B-1.2 Excavations Made in Type B Soil

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

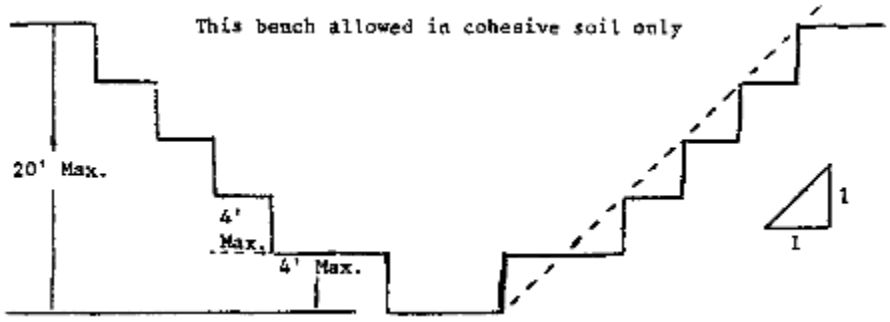


SIMPLE SLOPE

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:

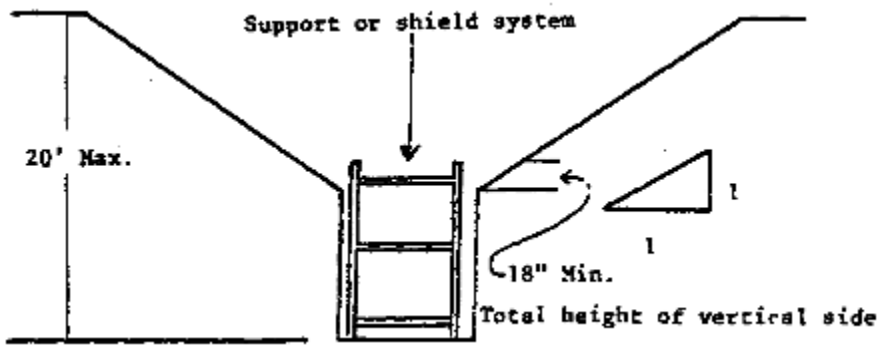


SINGLE BENCH



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.

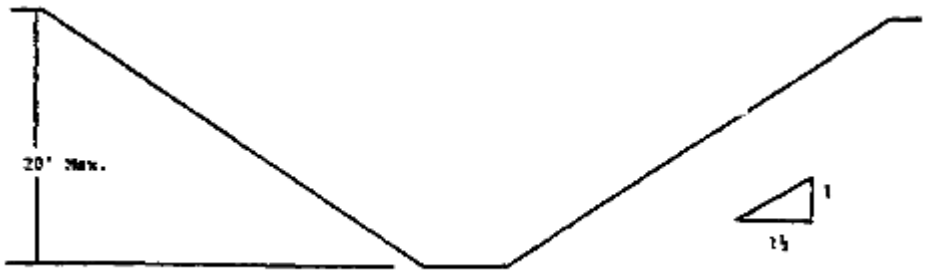


VERTICALLY SIDED LOWER PORTION

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

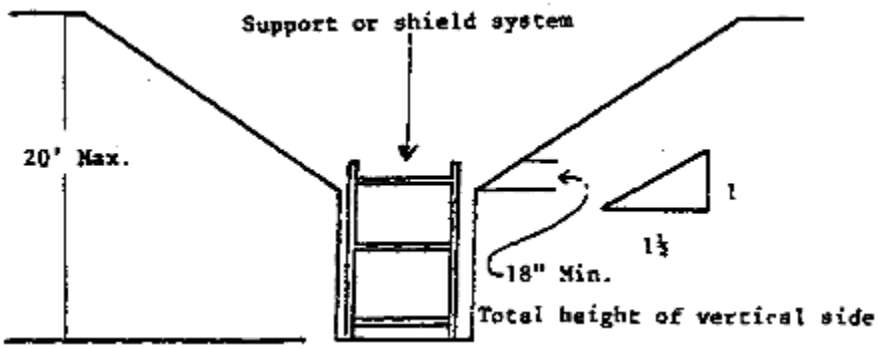
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



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 1½:1.

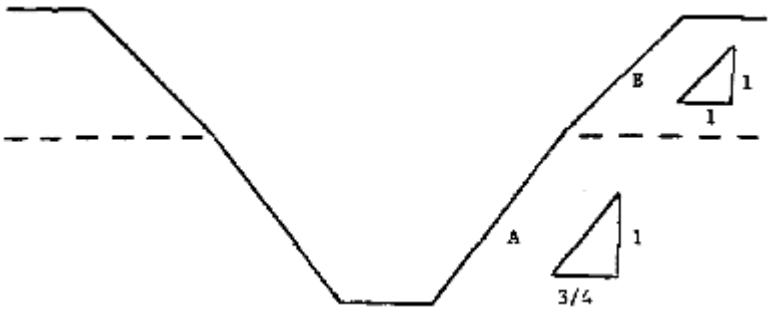


VERTICAL SIDED LOWER PORTION

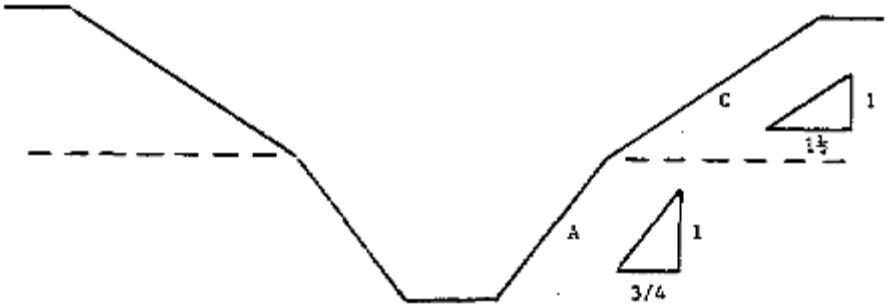
3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B-1.4 Excavations Made in Layered Soils

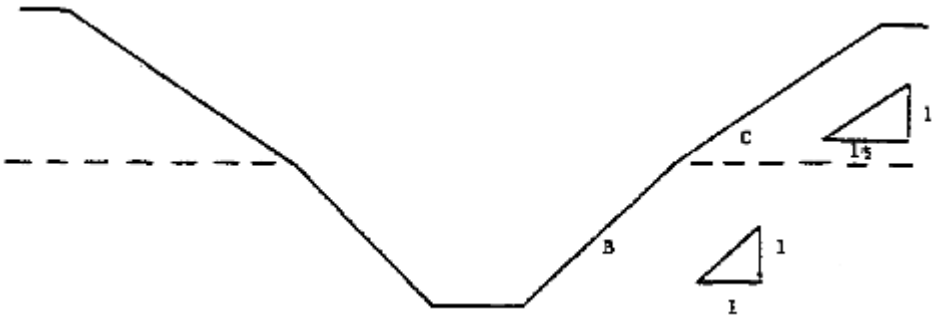
1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



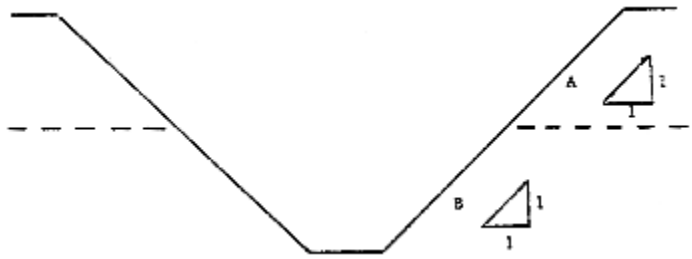
B OVER A



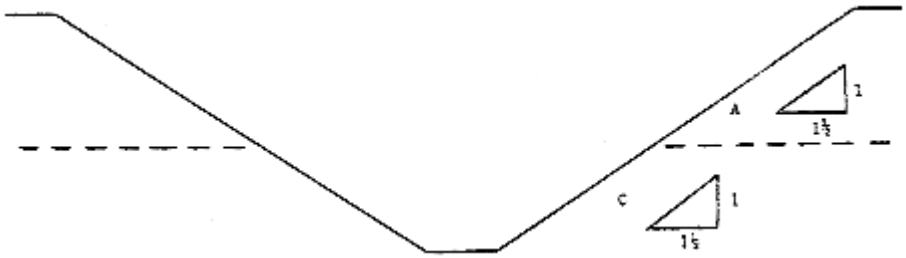
C OVER A



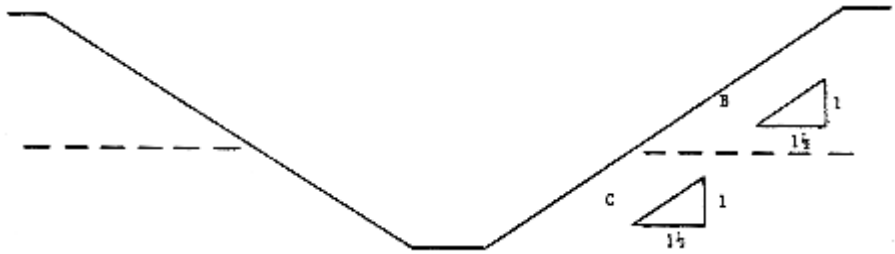
C OVER B



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).

1926 SUBPART P APPENDIX C – TIMBER SHORING FOR TRENCHES

(a) Scope. This appendix contains information that can be used when timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with 1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems, such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in 1926.652(b) and 1926.652(c).

(b) Soil Classification. In order to use the data presented in this appendix, the soil type of types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part.

(c) Presentation of Information. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C01.2, and C-1.3, and Tables C-2.1, C-2.2, and C-2.3 following paragraph (g) of the appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix, and on the tables themselves.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) Basis and limitations of the data. (1) Dimensions of timber members. (i) The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under 1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation, or data from other acceptable sources.

(2) Limitation of application. (i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with 1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless; The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) Use of Tables. The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) Examples to Illustrate the Use of Tables C-1.1 through C-1.3.

(1) Example 1.

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table C-1.1, for acceptable arrangements of timber can be used.

Arrangement #1

Space 4x4 crossbraces at six feet horizontally and four feet vertically.
Wales are not required.
Space 3x8 uprights at six feet horizontally. This arrangement is commonly called “skip shoring”.

Arrangement #2

Space 4x6 crossbraces at eight feet horizontally and four feet vertically.
Space 8x8 wales at four feet vertically.
Space 2x6 uprights at four feet horizontally.

Arrangement #3

Space 6x6 crossbraces at 10 feet horizontally and four feet vertically.
Space 8x10 wales at four feet vertically.
Space 2x6 uprights at five feet horizontally.

Arrangement #4

Space 6x6 crossbraces at 12 feet horizontally and four feet vertically.
Space 10x10 wales at four feet vertically.
Space 3x8 uprights at six feet horizontally.

(2) Example 2.

A trench dug in Type B soil is 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listed.

Arrangement #1

Space 6x6 crossbraces at six feet horizontally and five feet vertically.
Space 8x8 wales at five feet vertically.
Space 2x6 uprights at two feet horizontally.

Arrangement #2

Space 6x8 crossbraces at eight feet horizontally and five feet vertically.
Space 10x10 wales at five feet vertically.
Space 2x6 uprights at two feet horizontally.

Arrangement #3

Space 8x8 crossbraces at 10 feet horizontally and five feet vertically.
Space 10x12 wales at five feet vertically.
Space 2x6 uprights at two feet vertically.

(3) Example 3.

A trench dug in Type C soil is 13 feet deep and five feet wide. From Table C-1.3 two acceptable arrangements of members can be used.

Arrangement #1

Space 8x8 crossbraces at six feet horizontally and five feet vertically.
Space 10x12 wales at five feet vertically.
Position 2x6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #2

Space 8x10 crossbraces at eight feet horizontally and five feet vertically.
Space 12x12 wales at five feet vertically.
Position 2x6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(4) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.
Space 12x12 wales at five feet vertically.
Use 3x6 tight sheeting.
Use of Tables C-2.1 through C-2.3 would follow the same procedures.

(g) Notes for all Tables.

1. Member sizes at spacing other than indicated are to be determined as specified in 1926.652©, “Design of Protective Systems”.

2. When conditions are saturated or submerged use tight sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the tow of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE C-1.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P(a) = 25 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **						
	CROSS BRACES						
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	
5 TO 10	UP TO 6	4X4	4X4	4X6	6X6	6X6	4
	UP TO 8	4X4	4X4	4X6	6X6	6X6	4
	UP TO 10	4X6	4X6	4X6	6X6	6X6	4
	UP TO 12	4X6	4X6	6X6	6X6	6X6	4
10 TO 15	UP TO 6	4X4	4X4	4X6	6X6	6X6	4
	UP TO 8	4X6	4X6	6X6	6X6	6X6	4
	UP TO 10	6X6	6X6	6X6	6X8	6X8	4
	UP TO 12	6X6	6X6	6X6	6X8	6X8	4
15 TO 20	UP TO 6	6X6	6X6	6X6	6X8	6X8	4
	UP TO 8	6X6	6X6	6X6	6X8	6X8	4
	UP TO 10	8X8	8X8	8X8	8X8	8X10	4
	UP TO						

	12	8X8	8X8	8X8	8X8	8X10	4
OVER 20	SEE NOTE 1						

TABLE C-1.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P(a) = 25 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE	4	5	6	8
5 TO 10	Not Req'd	---				2X6	
	Not Req'd	---					2X8
	8X8	4			2X6		
	8X8	4				2X6	
10 TO 15	Not Req'd	---				3X8	
	8X8	4		2X6			
	8X10	4			2X6		
	10X10	4				3X8	
15	6X8	4	3X6				

	8X8	4	3X6				
TO							
	8X10	4	3X6				
20							
	10X10	4	3X6				
OVER 20	SEE NOTE 1						

* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE B P(a) = 45 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **						
	CROSS BRACES						
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	
5 TO 10	UP TO 6	4X6	4X6	6X6	6X6	6X6	5
	UP TO 8	6X6	6X6	6X6	6X8	6X8	5
	UP TO 10	6X6	6X6	6X6	6X8	6X8	5
	See Note 1						
10	UP TO 6	6X6	6X6	6X6	6X8	6X8	5
	UP TO 8	6X8	6X8	6X8	8X8	8X8	5

TO	UP TO 10	8X8	8X8	8X8	8X8	8X10	5
15	See Note 1						
	UP TO 6	6X8	6X8	6X8	8X8	8X8	5
15	UP TO 8	8X8	8X8	8X8	8X8	8X10	5
TO	UP TO 10	8X10	8X10	8X10	8X10	10X10	5
20	See Note 1						
OVER 20	SEE NOTE 1						

TABLE C-1.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE B P(a) = 45 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE	2	3		
5 TO 10	6X8	5			2X6		
	8X10	5			2X6		
	10X10	5			2X6		

	8X8	5		2X6			
10							
	10X10	5		2X6			
TO							
	10X12	5		2X6			
15							
	8X10	5	3X6				
15							
	10X12	5	3X6				
TO							
	12X12	5	3X6				
20							
OVER 20	SEE NOTE 1						

* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C P(a) = 80 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH	SIZE (ACTUAL) AND SPACING OF MEMBERS **					
	CROSS BRACES					
	HORIZ. SPACING	WIDTH OF TRENCH (FEET)				VERT. SPACING
		UP TO	UP TO	UP TO	UP TO	UP TO

(FEET)	(FEET)	4	6	9	12	15	(FEET)
5 TO 10	UP TO 6	6X8	6X8	6X8	8X8	8X8	5
	UP TO 8	8X8	8X8	8X8	8X8	8X10	5
	UP TO 10	8X10	8X10	8X10	8X10	10X10	5
	See Note 1						
10 TO 15	UP TO 6	8X8	8X8	8X8	8X8	8X10	5
	UP TO 8	8X10	8X10	8X10	8X10	10X10	5
	See Note 1						
	See Note 1						
15 TO 20	UP TO 6	8X10	8X10	8X10	8X10	10X10	5
	See Note 1						
	See Note 1						
	See Note 1						
OVER 20	SEE NOTE 1						

TABLE C-1.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C P(a) = 80 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE				
5 TO 10	8X10	5	2X6				
	10X12	5	2X6				
	12X12	5	2X6				
10 TO 15	10X12	5	2X6				
	12X12	5	2X6				
15 TO 20	12X12	5	3X6				
OVER 20	SEE NOTE 1						

* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P(a) = 25 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **						
	CROSS BRACES						
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	
5 TO 10	UP TO 6	4X4	4X4	4X4	4X4	4X6	4
	UP TO 8	4X4	4X4	4X4	4X6	4X6	4
	UP TO 10	4X6	4X6	4X6	6X6	6X6	4
	UP TO 12	4X6	4X6	4X6	6X6	6X6	4
10 TO 15	UP TO 6	4X4	4X4	4X4	6X6	6X6	4
	UP TO 8	4X6	4X6	4X6	6X6	6X6	4
	UP TO 10	6X6	6X6	6X6	6X6	6X6	4
	UP TO 12	6X6	6X6	6X6	6X6	6X6	4
15	UP TO 6	6X6	6X6	6X6	6X6	6X6	4
	UP TO						

	8	6X6	6X6	6X6	6X6	6X6	4
TO							
	UP TO 10	6X6	6X6	6X6	6X6	6X8	4
20							
	UP TO 12	6X6	6X6	6X6	6X8	6X8	4
OVER 20	SEE NOTE 1						

TABLE C-2.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P(a) = 25 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE	4	5	6	8
5	Not Req'd	Not Req'd				4X6	
TO	Not Req'd	Not Req'd					4X8
10	8X8	4			4X6		
	8X8	4				4X6	
10	Not Req'd	Not Req'd				4X10	
	6X8	4		4X6			
TO	8X8	4			4X8		

15	8X10	4		4X6		4X10	
	6X8	4	3X6				
15	8X8	4	3X6	4x12			
TO	8X10	4	3X6				
20	8X12	4	3X6	4x12			
OVER 20	SEE NOTE 1						

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE B P(a) = 45 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **						
	CROSS BRACES						
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	
5 TO 10	UP TO 6	4X6	4X6	4X6	6X6	6X6	5
	UP TO 8	4X6	4X6	6X6	6X6	6X6	5
	UP TO 10	4X6	4X6	6X6	6X6	6X8	5
	See Note 1						

10 TO 15	UP TO 6	6X6	6X6	6X6	6X8	6X8	5
	UP TO 8	6X8	6X8	6X8	8X8	8X8	5
	UP TO 10	6X8	6X8	8X8	8X8	8X8	5
	See Note 1						
15 TO 20	UP TO 6	6X8	6X8	6X8	6X8	8X8	5
	UP TO 8	6X8	6X8	6X8	8X8	8X8	5
	UP TO 10	8X8	8X8	8X8	8X8	8X8	5
	See Note 1						
OVER 20	SEE NOTE 1						

TABLE C-2.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE B P(a) = 45 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE	2	3		
	6X8	5			3X12 4X8		4X12

5 TO 10	8X8	5		3X8		4X8	
	8X10	5			4X8		
10 TO 15	8X8	5	3X6	4X10			
	10X10	5	3X6	4X10			
	10X12	5	3X6	4X10			
15 TO 20	8X10	5	4X6				
	10X12	5	4X6				
	12X12	5	4X6				
OVER 20	SEE NOTE 1						

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C P(a) = 80 X H + 72 psf (2 ft Surcharge)

	SIZE (S4S) AND SPACING OF MEMBERS **

DEPTH OF TRENCH (FEET)	CROSS BRACES						
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15	
5 TO 10	UP TO 6	6X6	6X6	6X6	6X6	8X8	5
	UP TO 8	6X6	6X6	6X6	8X8	8X8	5
	UP TO 10	6X6	6X6	8X8	8X8	8X8	5
	See Note 1						
10 TO 15	UP TO 6	6X8	6X8	6X8	8X8	8X8	5
	UP TO 8	8X8	8X8	8X8	8X8	8X8	5
	See Note 1						
	See Note 1						
15 TO 20	UP TO 6	8X8	8X8	8X8	8X10	8X10	5
	See Note 1						
	See Note 1						
	See Note 1						
OVER 20	SEE NOTE 1						

TABLE C-2.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C P(a) = 80 X H + 72 psf (2 ft Surcharge)

[Continued]

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **						
	WALES		UPRIGHTS				
	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
			CLOSE				
5 TO 10	8X8	5	3X6				
	10X10	5	3X6				
	10X12	5	3X6				
10 TO 15	10X10	5	4X6				
	12X12	5	4X6				
15 TO	10X12	5	4X6				

20							
OVER 20	SEE NOTE 1						

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
** Manufactured members of equivalent strength may be substituted for wood.

1926 SUBPART P APPENDIX D – ALUMINUM HYDRAULIC SHORING FOR TRENCHES

(a) Scope. This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with 1926-652(c)(2).

(b) Soil Classification. In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) Presentation of Information. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3, and D-1.4. Each table presents the maximum vertical and horizontal spacing that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soils.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations (Footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled “Aluminum Hydraulic Shoring: Typical Installations”.

(d) Basis and limitations of the data.

(1) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(3) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with 1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.
(C) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) Use of Tables D-1.1, D-1.2, D-1.3, and D-1.4. The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting. Type B soils that may require sheeting, and Type C soils that always require sheeting, are found in the horizontal wale Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) Example to Illustrate the Use of the Tables:

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1; Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2; Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The trench is 16 feet deep and 9 feet wide. From Table D-1.2; Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by Footnote #2) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically. Plywood (per Footnote (g)(7) to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep, and 12 feet wide 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally, 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil. 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch

diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically, 3.12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(g) Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

(1) For applications other than those listed in the tables, refer to 1926.652(c)(2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to 1926.652(c)(2) and 1926.652(c)(3).

(2) 2 inch diameter cylinders, at this width, shall have structural steel tube (3.5x3.5x0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4)All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 inch thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.

ALUMINUM HYDRAULIC SHORING
TYPICAL INSTALLATIONS

Figure No. 1 - Vertical aluminum hydraulic shoring (spot bracing)

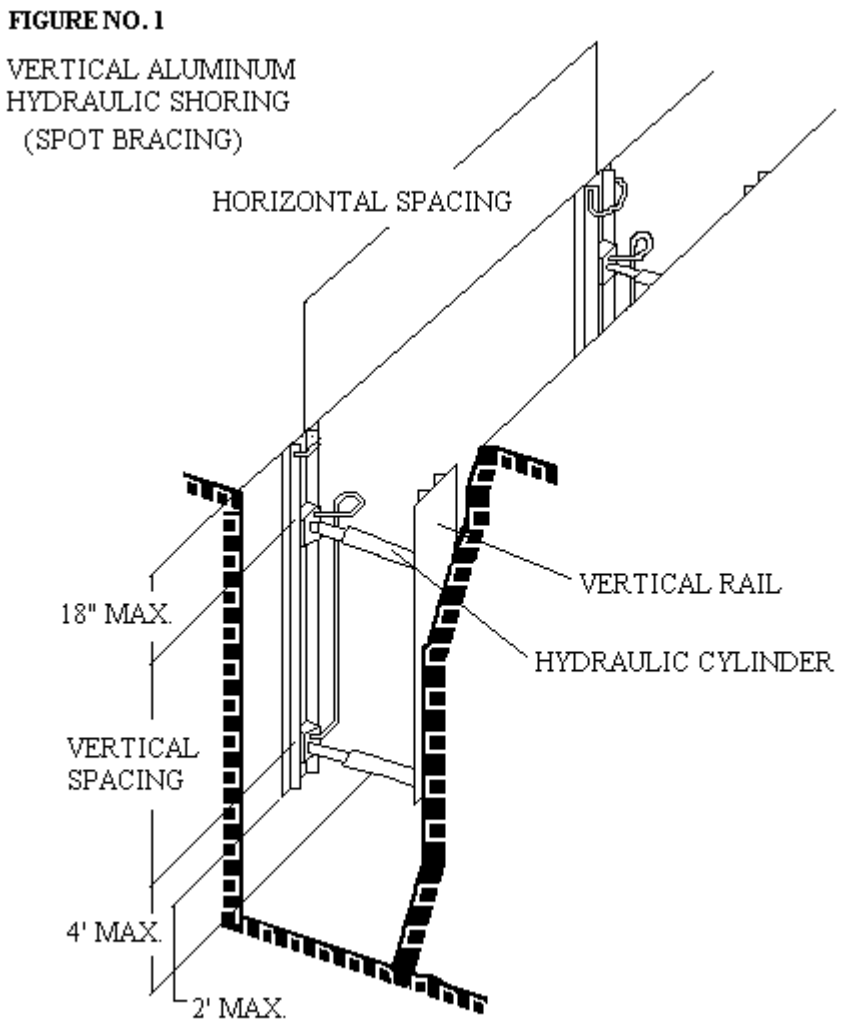


Figure No. 2 - Vertical aluminum hydraulic shoring (with plywood)

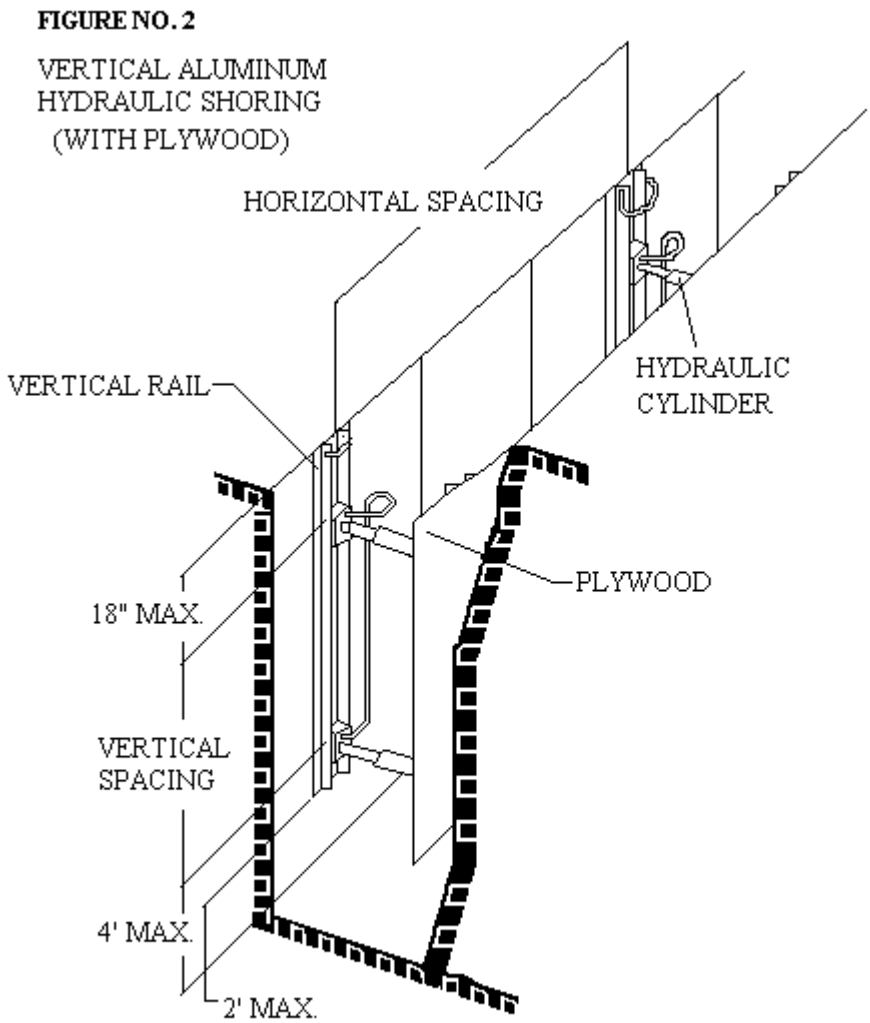


Figure No. 3 - Vertical aluminum hydraulic shoring (stacked)

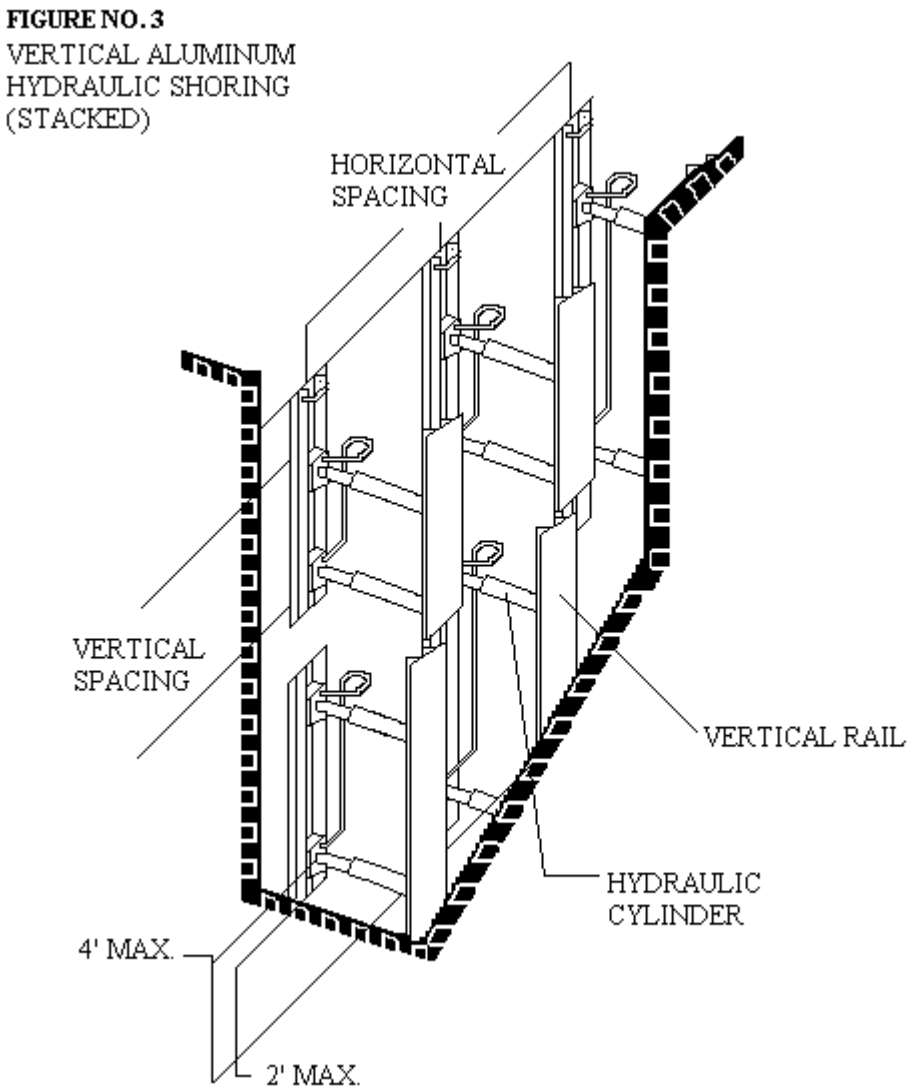


Figure No. 4 - Aluminum hydraulic shoring - Waler System (typical)

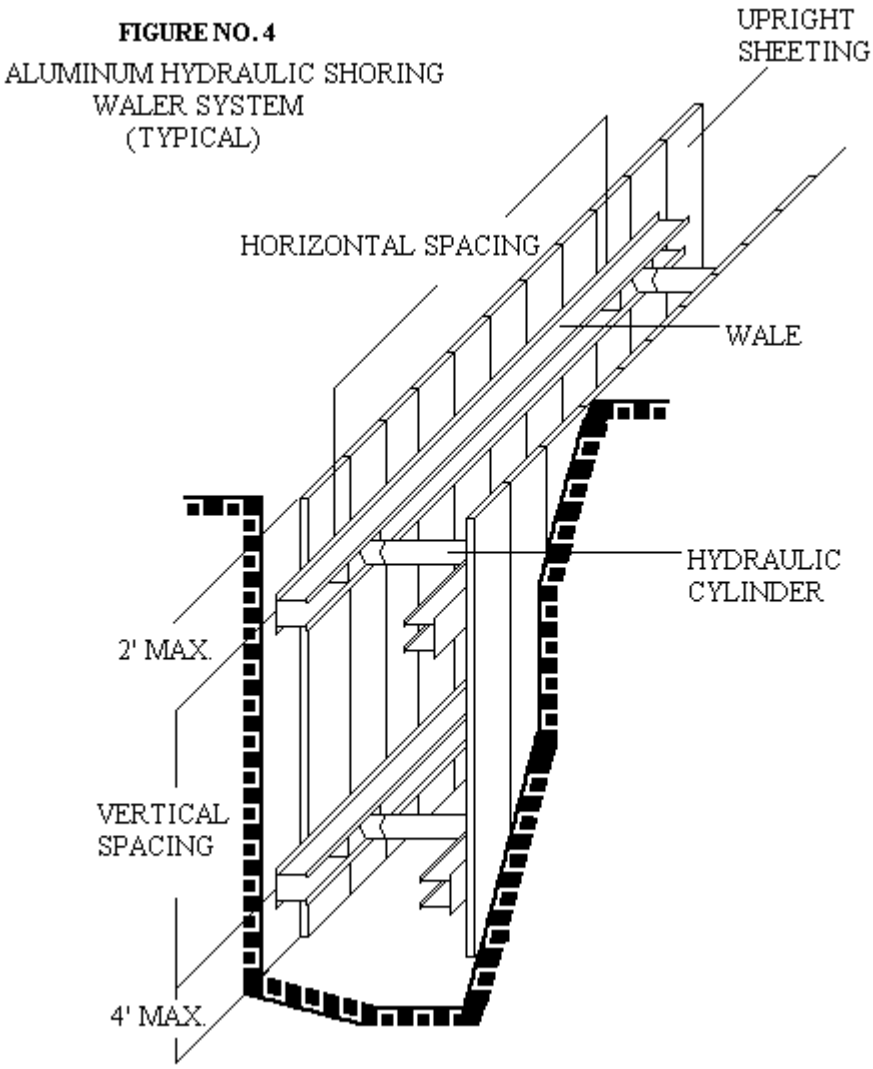


TABLE D - 1.1

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				
OVER 10 UP TO 15	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE(2)	3 INCH DIAMETER
OVER 15 UP TO 20	7				
OVER 20	NOTE(1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in 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

	HYDRAULIC CYLINDERS

DEPTH OF TRENCH (FEET)	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				
OVER 10 UP TO 15	6.5	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE(2)	3 INCH DIAMETER
OVER 15 UP TO 20	5.5				
OVER 20	NOTE(1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in 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
WALER SYSTEMS
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS			
	VERTICAL SPACING (FEET)	* SECTION MODULUS (IN(3))	WIDTH OF TRENCH (FEET)			
			UP TO 8		OVER 8 UP TO 12	
			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)
		7.0	9.0	2 IN	9.0	2 IN NOTE (2)
		14.0	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)
		7.0	8.0	3 IN	8.0	3 IN
		14.0	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)
		7.0	6.0	3 IN	6.0	3 IN
		14.0	9.0	3 IN	9.0	3 IN
OVER 20	NOTE (1)					

TABLE D - 1.3
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE B

[Continued]

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

UP TO 15		14.0	10.0	3 IN			
OVER 15 UP TO 20	4	3.5	5.5	3 IN			
		7.0	6.0	3 IN	3x12	---	---
		14.0	9.0	3 IN			
OVER 20	NOTE (1)						

Footnotes to tables, and general notes on hydraulic shoring, are found in 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
WALER SYSTEMS
FOR SOIL TYPE C

DEPTH OF TRENCH (FEET)	WALES: VERTICAL SPACING (FEET)	WALES: * SECTION MODULUS (IN(3))	HYDRAULIC CYLINDERS — WIDTH OF TRENCH (FEET): UP TO 8: HORIZ SPACING	UP TO 8: CYLINDER DIAMETER	OVER 8 UP TO 12: HORIZ SPACING	OVER 8 UP TO 12: CYLINDER DIAMETER
OVER 5 UP TO 10	4	3.5	6.0	2 IN	6.0	2 IN NOTE (2)
		7.0	6.5	2 IN	6.5	2 IN NOTE (2)
		14.0	10.0	3 IN	10.0	3 IN
OVER 10 UP TO	4	3.5	4.0	2 IN	4.0	2 IN NOTE (2)
		7.0	5.5	3 IN	5.5	3 IN

15		14.0	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)
		7.0	5.0	3 IN	5.0	3 IN
		14.0	6.0	3 IN	6.0	3 IN
OVER 20	NOTE (1)					

TABLE D - 1.4
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE C

[Continued]

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

15 UP TO 20	4	7.0	5.0	3 IN	3x12	---	---
		14.0	6.0	3 IN			
OVER 20	NOTE (1)						

Footnotes to tables, and general notes on hydraulic shoring, are found in 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.

1926 SUBPART P APPENDIX E – ALTERNATIVES TO TIMBER SHORING

Alternatives to Timber Shoring

Figure 1 - Aluminum Hydraulic Shoring

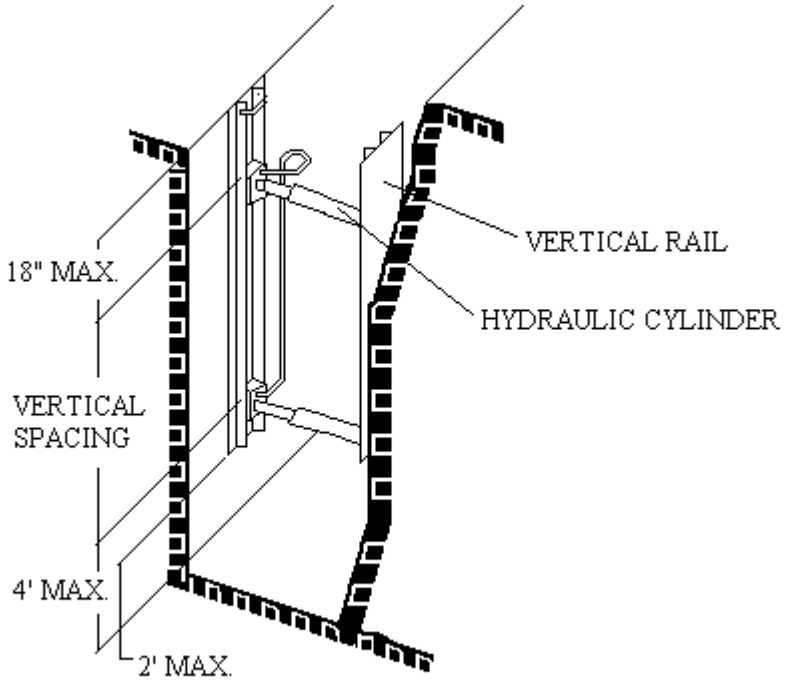


Figure 1. Aluminum Hydraulic Shoring

Figure 2 - Pneumatic/hydraulic Shoring

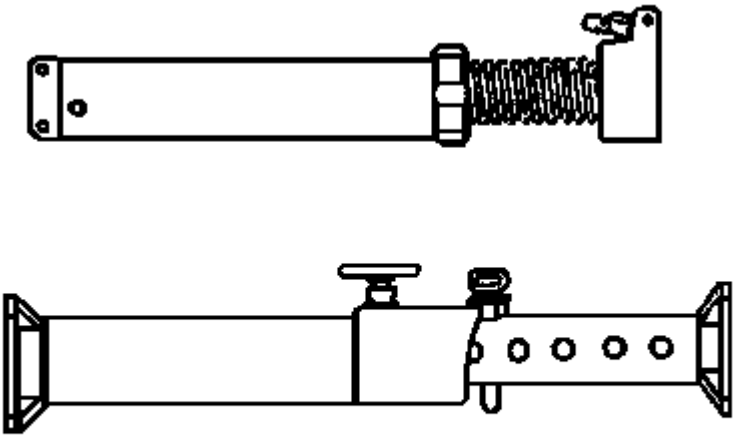


Figure 2. Pneumatic/hydralic Shoring

Figure 3 - Trench Jacks (Screw Jacks)
Figure 4 - Trench Shields

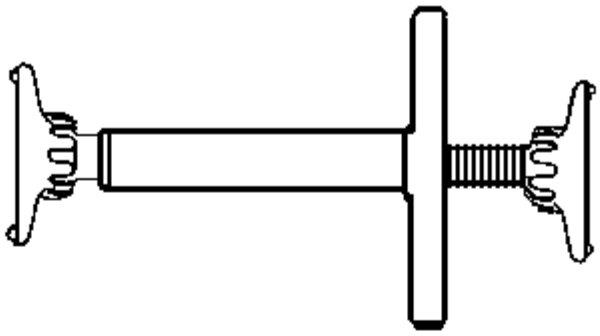


Figure 3. Trench Jacks (Screw Jacks)

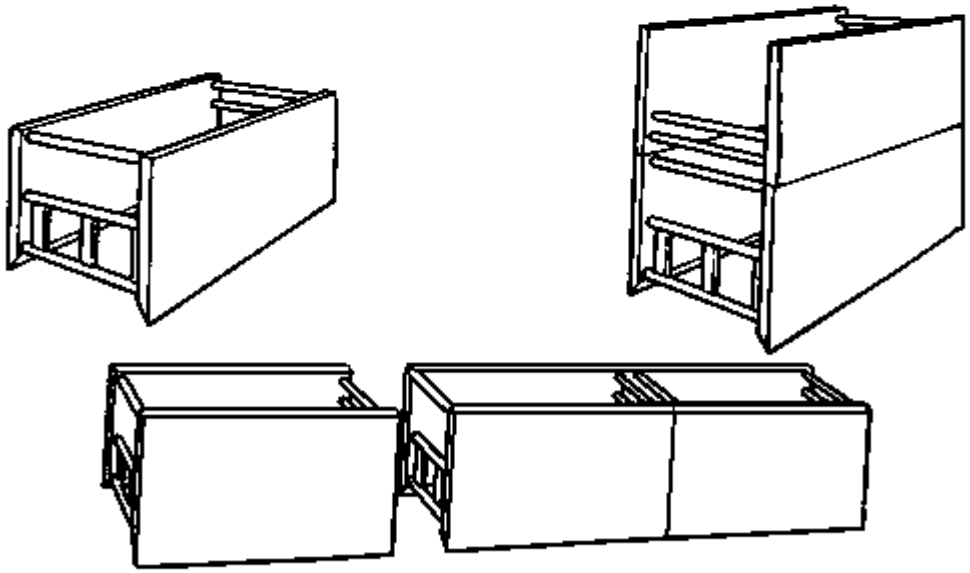


Figure 4. Trench Shields

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 1926.652(b) and (c).

```
 _________________________
|                         |
| Is the excavation more  |
```

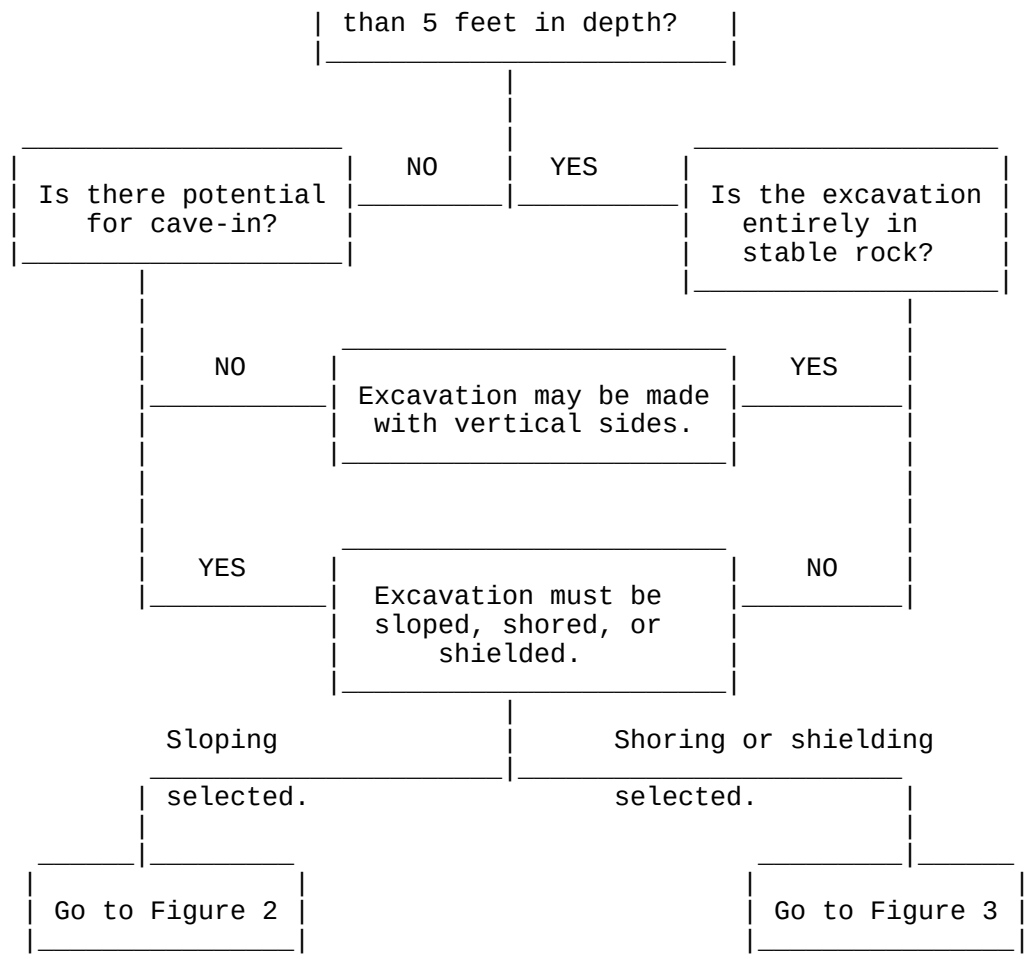
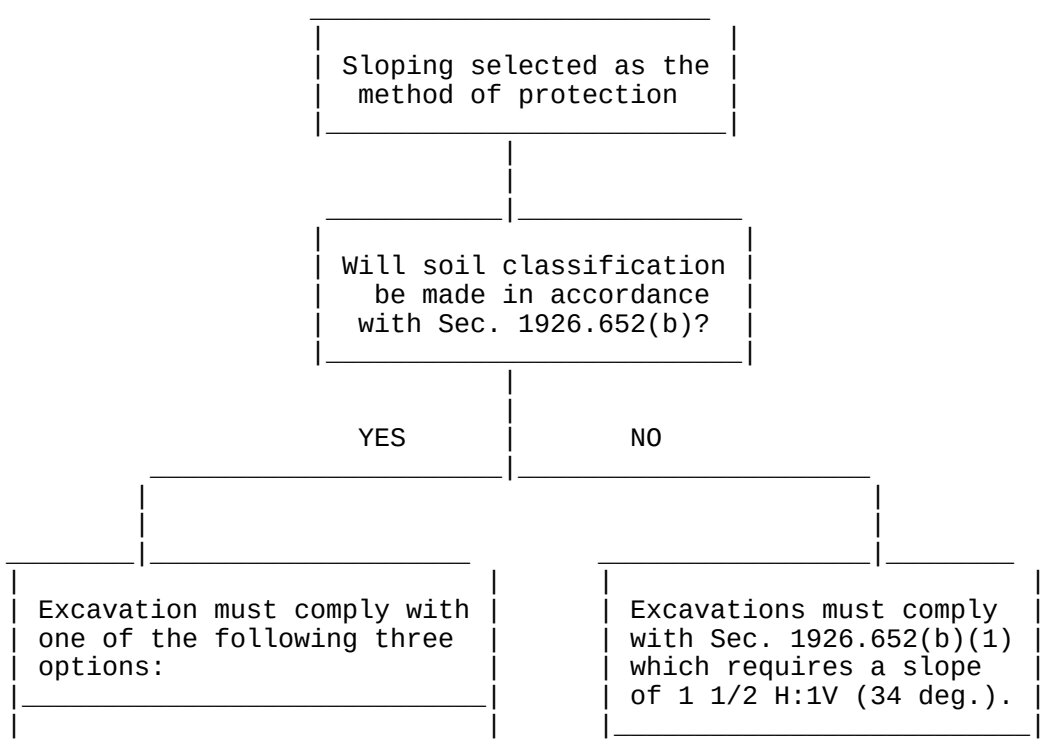


FIGURE 1 - PRELIMINARY DECISIONS



```
|        Option 1:            |
|                             |
| Sec. 1926.652(b)(3) which   |
| requires Appendices A       |
| and B to be followed        |
|                             |
|                             |
|        Option 2:            |
|                             |
| Sec. 1926.652(b)(3) which   |
| requires other tabulated    |
| data (see definition to     |
| be followed.                |
|                             |
|                             |
|        Option 3:            |
|                             |
| Sec. 1926.652(b)(4) which   |
| requires the excavation to  |
| be designed by a registered |
| professional engineer.      |
|_____________________________|
```

FIGURE 2 - SLOPING OPTIONS

```
 ____________________________________
|                                    |
|   Shoring or shielding selected    |
|   as the method of protection.     |
|____________________________________|
                |
                |
 ________________|___________________
|                                    |
| Soil Classification is required    |
| when shoring or shielding is       |
| used. The excavation must comply   |
| with one of the following four     |
| options:                           |
|____________________________________|
|                                    |
|            Option 1                |
|                                    |
| Sec. 1926.652(c)(1) which requires |
| Appendices A and C to be followed  |
| (e.g. timber shoring).             |
|                                    |
|                                    |
|            Option 2                |
|                                    |
| Sec. 1926.652(c)(2) which requires |
| manufacturers data to be followed  |
| (e.g. hydraulic shoring, trench    |
| jacks, air shores, shields).       |
|                                    |
|                                    |
|            Option 3                |
|                                    |
| Sec. 1926.652(c)(3) which requires |
| tabulated data (see definition) to |
| be followed (e.g. any system as    |
| per the tabulated data).           |
|                                    |
|                                    |
```

```
|            Option 4                |
|                                    |
| Sec. 1926.652(c)(4) which requires |
| the excavation to be designed by a |
| registered professional engineer   |
| (e.g. any designed system).        |
|____________________________________|
```

FIGURE 3 - SHORING AND SHIELDING OPTIONS

EXCAVATION TRAINING

A competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply (i.e., Hazard Communication, Confined Space, and Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the programs, along with the hazards associated.
All other workers working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating.

EXPLOSIVES AND BLASTING

Only authorized and qualified persons may handle and use explosives. Explosives and related materials will be stored in approved facilities following applicable provisions of BATF (the Bureau of Alcohol/Tobacco/Firearms). Smoking and open flames will not be permitted within 50 feet of explosives and detonator storage magazines. Procedures permitting safe and efficient loading will be established before loading is started.

EYE AND FACE PROTECTION

Eye and face protection will be provided and worn when there is any potential for eye or face injury. This includes employees involved in welding operations will wear filter lenses or plates of proper shade number, along with a face shield.

FALL PROTECTION (GENERAL)

Employees on a walking/working surface (horizontal or vertical) with an unprotected side or edge of six (6) feet or more above a lower level will be protected from falling by a guardrail system, safety net system, or personal fall arrest system. Employees will be protected from falling through holes (including skylights) more than six (6) feet above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes. Employees on ramps, runways, or other walkways will be protected from falling six (6) feet or more to lower levels by guardrail systems. Employees working on, at, above, or near wall openings where the outside bottom edge of opening is six (6) feet or more above lower levels and the inside bottom edge of wall opening is less than 39 inches above walking/working surface, will be protected by guardrail system, safety net system, or personal fall arrest system. When guardrail systems are used around holes that are used as points of access, they will be provided with a gate, or be so offset that a person cannot walk directly into the hole.

FIRE PROTECTION

Fire fighting equipment will be conspicuously located and readily accessible at all times, will be periodically inspected, and be maintained in proper operating condition. If a building includes installation of automatic sprinkler protection, installation will closely follow construction and be placed in service, as soon as applicable laws permit, following completion of each story. Fire extinguishers, rated not less than 2A, will be provided for each 3,000 square feet of building area, or major fraction thereof. Travel distance from any point to the nearest fire extinguisher will not exceed 100 feet. One (1) or more fire extinguishers, rated not less than 2A, will be provided on each floor. In multi-story buildings, at least one (1) fire extinguisher will be located adjacent to stairway.

FLAGGERS

When signs, signals, and barricades do not provide necessary protection on, or adjacent to, a highway or street, flaggers or other appropriate traffic controls will be provided. Flaggers will wear high-visibility warning garments. Warning garments worn at night will consist of reflectorized material.

FLAMMABLE AND COMBUSTIBLE LIQUIDS

Only approved containers and portable tanks will be used for storing and handling flammable and combustible liquids. No more than 25 gallons of flammable or combustible liquids will be stored in a room outside of an approved storage cabinet. No more than three (3) storage cabinets may be located in a single storage area. Inside storage rooms for flammable and combustible liquids will consist of fire-resistive construction, having self-closing fire doors at all openings, 4-inch sills or depressed floors, a ventilation system that provides at least six (6) air changes per hour, and electrical wiring and equipment approved for Class I, Division 1, locations. Storage in containers outside buildings will not exceed 1,100 gallons in any one (1) pile or area. Storage areas will be graded to divert possible spills away from buildings or other exposures, or will be surrounded by a curb or dike. Storage areas will be located at least 20 feet from any building and will be free from weeds, debris, and other combustible materials. Flammable liquids will be kept in closed containers when not actually in use. Conspicuous and legible signs prohibiting smoking in the area will be posted.

FLOOR HOLE COVERS

Any gap or void of two (2) inches or more in its least dimension, in a floor, roof, or other walking/working surface must have a cover. Hole covers located in roadways and vehicular aisles must be capable of supporting at least twice maximum axle load of largest vehicle expected to cross over the cover. All other hole covers must be capable of supporting at least twice the weight of employees that may be exposed. Hole covers will be secured when installed to prevent accidental displacement. Hole covers will be color-coded or marked with the word “HOLE” or “COVER” to provide warning of the hazard.

FORKLIFTS

No employee will be allowed to operate any forklift unless they have been properly trained in the type or class of machine to be operated. Operators must be familiar with the location of the on/off switch, raise and lower controls, side shift and tilt controls, and methods of steering, braking and acceleration. The load will be kept as close to the floor or ground as possible. No person will be allowed to stand or pass under the elevated portion of any forklift. No personnel, other than the operator, will be permitted to ride on any forklift. When a forklift is left unattended, load engaging means will be fully lowered, controls will be neutralized, power will be shut off, and brakes set. Wheels will be blocked if the truck is parked on an incline. Brakes will be set on trucks, trailers, or railroad cars, while loading or unloading, to prevent movement. Fire aisles, roads, and access to stairways, will be kept clear at all times. The driver will look in the direction of, and keep a clear view of, the path of travel. If any load being carried would obstruct the driver's forward view the driver will travel with the load trailing. When ascending or descending grades in excess of 10 percent, loaded forklifts will be driven with the load upgrade. On all grades the load will be tilted back if applicable, and raised only as far as necessary to clear the road surface. Under all travel conditions, forklifts will be operated at a speed that will permit it to be brought to a stop in a safe manner. Dock board or bridge plates will be properly placed before they are driven over and the rated capacity will not be exceeded. While negotiating turns, speed will be reduced to a safe level. Only loads within the rated capacity of the forklifts will be handled. The load engaging means (forks) will be placed under the load as far as possible. The mast will be carefully tilted backward to stabilize the load. Extreme care will be used when tilting the load forward or backward. An elevated load will not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load will be used. If at any time a forklift is found to be in need of repair, defective, or in any way unsafe, it will be taken out of service until it has been restored to safe operating condition.

GASES, VAPORS, FUMES, DUSTS, AND MISTS

Exposure to toxic gases, vapors, fumes, dusts, and mists, at a concentration above those specified in the Threshold Limit Values of Airborne Contaminants for 1970 of ACGIH, will be avoided. Administrative or engineering controls must be implemented, whenever feasible, to comply with TLVs. When engineering and administrative controls are not feasible, protective equipment or other protective measures will be used to keep exposure of employees within the limits prescribed. Equipment and technical measures used must first be approved for each particular use by a competent industrial hygienist or other technically-qualified person.

GENERAL SAFETY AND HEALTH

Edgerton Contractors Inc./Edgerton Trucking, Inc. will initiate and maintain programs to provide for frequent and regular inspections of job sites, materials, and equipment, and will instruct each employee in recognition and avoidance of unsafe conditions, along with the regulations applicable to the work environment to control or eliminate any hazards or other exposure that could cause illness or injury. Only employees qualified by training or experience are permitted to operate equipment and machinery.

HAND TOOLS

Edgerton Contractors Inc./Edgerton Trucking, Inc. will not permit the use of unsafe hand tools. Wrenches will not be used when jaws are broken or not working properly. Impact tools will be kept free of mushroomed heads. Wooden handles of tools will be kept tight in the tool and free of splinters or cracks. Electric power-operated tools will either be approved double-insulated, or will be properly grounded. Any tools or equipment that are found to be defective for any reason, must not be used, taken out of service, and must have a "DO NOT USE" tag attached, describing what is wrong with that tool or equipment, along with where the tool or equipment came from. That defective tool or equipment must then be turned into the shop for repair or replacement.

HAZARD COMMUNICATION

Edgerton Contractors, Inc./Edgerton Trucking, Inc. is firmly committed to providing all of its employees with a safe and healthy work environment. It is a matter of company policy to provide our employees with information about hazardous chemicals on the worksite through our hazard communication program, which includes container labeling, Material Safety Data Sheets (MSDS) and employee information/training.

Julie Cox, Safety Manager, will have the overall responsibility for coordinating the hazard communication program for Edgerton Contractors, Inc./Edgerton Trucking, Inc., Julie Cox will make our written hazard communication program available, upon request, to employees, their designated representatives, the Assistant secretary of Labor for Occupational Safety and Health and the Director of the National Institute for Occupational Safety and Health.

List of Hazardous Chemicals

Julie Cox will compile a list of all hazardous chemicals that will be used on the worksite by reviewing container labels and Material Safety Data Sheets. The list will be updated as necessary. It will be kept at 6466 South 13th Street, Oak Creek, Wisconsin 53154. (See the following list of hazardous chemicals.)

100% SYNTHETIC UNIV AUTO TRANS FLUID (ATF)	**DOLOMITE**
3M 504 RESPIRATOR CLEANER WIPE	**DR. TRANNY KOOLER KLEEN**
3M SUPER TRIM ADHESIVE	**DRY GRAPHITE FILM LUBRICANT**
ACETYLENE	**DURON 15W-40 HEAVY DUTY ENGINE OIL**
ACME – WACO NO. 1 FUEL OIL	**DUSTBUSTER PLUS**
ACME – WACO NO. 2 FUEL OIL	**ELECTRICAL SHEET – ALLOY STEEL**
ADS SPRAY-ON LUBRICANT	**EXXON NUTO H 46**
AIR (N2 & O2 MIXTURE)	**EXXTRANS 10W MANUAL TRANS FLUID**
AIR BRAKE SYSTEM ANTI-FREEZE	**FERRIC CHLORIDE SOLUTION**
AIRFLEX 4514 EMULSION	**FLEETWELD 37**
ALKALINE BATTERY – NO MERCURY FORMULA	**FLY ASH – WE COAL COMBUSTION PROD. FLUE GAS DESULFURATION (FGD)**
ALUMINUM – COATED STEEL WIRE	**FREEZE-OFF SUPER PENETRANT**
ANTI-FREEZE 578-2/578-3	**FREEZETROL 77W**
ARC METAL REMOVER	**FRESHLY MIXED UNHARDENED CONCRETE**
ARGON	**FT-12 SODIUM SACCHARIN FIT TEST SOLUTION**
ATL AIR TOOL LUBRICANT	**GALVANIZED STEEL FENCE PRODUCTS**
BALKAMP 242 THREADLOCKER	**GAS METAL ARC WELDING SOLID WIRE**
BALKAMP 271 THREADLOCKER	**GEOSYNTHETICS CEMENT**
BALKAMP AVIATION FORM-A-GASKET	**GM MULTIPURPOSE GREASE**
BALKAMP GASKET REMOVER	**GRANULAR TRIPLE SUPERPHOSPHATE (GTSP)**
BALKAMP LUBRIGARD ANTI-SZ	**HOT MIX ASPHALT**
BAR'S LEAKS COOLING SYSTEM STOP LEAK	**ICE-FREE CONVEYOR (DEGPG)**
BATTERY TERMINAL PROTECTOR	**INDUSTRIAL CHOICE AEROSOL – INVERTED STRIPING**
BENTLEY WELDING RODS	**INDUSTRIAL CHOICE AEROSOL –**

	SOLVENT
BENZENE	INTERCOOL P-323
BITUMINOUS & SUB-BITUMINOUS ASH	JAX MAGNA-PLATE 1000 LUBRICATING GREASE
BLACK DRY INK PLUS 1025/1038	JAX MULTI-PURPOSE GEAR OIL
BULK ICE CONTROL SALT	JAX PARTS WASH SOLVENT
CALCIUM CHLORIDE SOLUTION	JAX PREMIUM HYDRAULIC OIL – TYPE Z
CAT ADVANCED GREASE (NLGI #2)	JAX TITAN MOTOR OIL
CAT HYDRAULIC OIL (HYDO) SAE 10W	JET – LH 78 MR
CAT LIQUID GASKET SEALER	JETWELD LH 70
CAT TRANS & DRIVE TRAIN OIL (TDTO) 30	KRYLON LINE-UP STRIPING PAINT – HWY YELLOW
CAT YELLOW ENAMEL	LINCOLNWELD L-56 CARBON STEEL WIRE
CBW PIPE CARBON STEEL	LIGNITE & SUB-BITUMINOUS COAL FLY ASH – CLASS C
CHEVRON DEXCOOL ANTI-FREEZE/COOLANT	LIMESTONE
CITGO UNLEADED GASOLINE	LINK BELT HYDRAULIC OILS
COATED HIGH ALLOY ELECGRODES	LIQUID PAPER CORRECTION FLUID
COMPRESSED AIR CYLINDER	LIQUID CALCIUM CHLORIDE SOLUTION
CRC BRAKLEEN BRAKE PARTS CLEANER	LIQUIDOW
CRUSHED CONCRETE	LIQUIFIED PETROLEUM GAS (LPG)
CRYSTALLINE SILICA	L-TEC FLUX
L-TEC SOLID STEEL WELDING ELECTRODES	PHOENIX 27-A WATER DISP. PIPE JOINT LUBRICANT
MAC'S BATTERY TERMINAL PROTECTOR	PHOENIX 28-B PIPE JOINT LUBRICANT
MAC'S CARB & CHOKE & TBC CARBURETOR CLEANER	POLAR FLEET ANTI-FREEZE
MAC'S GLASS CLEANER	PORTLAND CEMENT
MAC'S RUST INHIBITOR	PROPYLENE
MAC'S STARTING FLUID	PYRO-CHEM ABC MULTI-PURPOSE FIRE EXTINGUISHERS
MAGNAPLEX LUBRICATING GREASE	PYROIL WINDSHIELD WASHER CONCENTRATE
MANUAL TRANSMISSION OIL	RAID WASP & HORNET KILLER
MARATHON NO. 1 LOW SULFUR DIESEL FUEL	RESINOLD BONDED GRINDING WHEEL
MARATHON NO. 2 LOW SULFUR DIESEL FUEL	ROUNDUP WEED & GRASS KILLER CONCENTRATE PLUS
MARATHON REGULAR UNLEADED GASOLINE	SILICA FUME CEMENT
MASONRY CEMENT	SKELGAS PROPANE
MAX CEMENT	SOILAX POWDERED CLEANER
METAL & FLUX CORED ELECTRODES	SOIL-SEMENT
MOBILUBE HD PLUS 80W 90	STARGOLD C10, C15,C18,C20,C25,C40,C50 SHIELDING GAS MIXTURES
MILORGANITE	STARGON 4788
MOBIL DELVAC 1230	SUPERSTRIPE ATHLETIC PAINT – HOT ORANGE
MOBIL DELVAC 1300	SYMEX GOUCHING ELECTRODE
MOBIL DELVAC 1310	SYNPOWER FS 75W 90 GEAR OIL
MOBIL DELVAC 1630	TRIPAM (SOIL NET)
MOBIL EAL 224H	ULTRA LOW SULFUR DIESEL (ULSD) FUEL

MOBIL FLUID 424	**UNISOL LIQUID RED BK-50**
MIBIL GREASE HP	**VISIONAID DISINFECTANT WIPES**
MORTAR CEMENT	**WEARSHIELD ABR**
NAPA BRAKE FLUID DOT 3	**WELDING WIRE**
NAPA HIGH TACK GASKET SEALANT	**WESTERN HIGH-CALCIUM PEBBLE LIME**
NAPA HIGH TACK SPRAY-A-GASKET SEALANT	**WINDSHIELD WASHER ANTI-FREEZE**
NAPA KOOL COOLANT ADDITIVE	**WIRE MESH & TUBING**
NAPA POWER STEERING FLUID	**ZEP 2000 0276 LIQUID TRUCK/TRLR WASH**
NAPA SIL-GLYDE AEROSOL	**ZEP 2000 1000 ZEP SCRUB 'EMS**
NAPA TIRE MOUNTING & RUBBER LUBRICANT	**ZEP 2000 X10581 FLOOR FINISH**
NATURAL SAND & GRAVEL	**ZEP LUBRISL**
NEW CEMENT	**ZEP TNT**
NITROGEN	**ZINC METAL**
NO-TOUCH ORIGINAL TIRE CARE	
ORTHO WEED-B-GON MAX CONCENTRATE	
OXYGEN	
PAVING & EMULSION BASE ASPHALT	
PB PENETRATING CATALYST	
PETROLANE PROPANE	
PETROLEUM HYDROCARON PLUS ADDITIVES	

Labeling

It is the policy of this company to ensure that each container of hazardous chemicals on a jobsite is properly labeled. The labels will list:

- The contents of the container
- Appropriate hazard warnings
- The name and address of the manufacturer, importer, or other responsible party

To further ensure that employees are aware of the chemical hazards of materials used in their work areas, it is our policy to label all secondary containers. Secondary containers will be labeled with either an extra copy of the manufacturer's label, or with a sign or generic label that lists the container's contents and appropriate hazard warnings.

Material Safety Data Sheets (MSDS)

Copies of Material Safety Data Sheets for all hazardous chemicals to which employees may be exposed are kept at 6466 South 13th Street, Oak Creek, Wisconsin 53154 and are readily accessible to employees in the work area during each work shift. Julie Cox is responsible for obtaining, maintaining, and updating the file of Material Safety Data Sheets.

Employee Training

Employees are to attend a training session on hazardous chemicals in their work area at the time of their initial work assignment. The training session will cover the following:

- An overview of the hazard communication requirements
- A review of the chemicals present in their workplace operations.
- The location and availability of our written hazard communication program
- A list of hazardous chemicals and Material Safety Data Sheets

- Methods and observation techniques that may be used to detect the presence or release of hazardous chemicals in the work area
- The health hazards of the chemicals in the work area, including signs and symptoms of exposure and any medical condition known to be aggravated by exposure to the chemical
- How to lessen or prevent exposure to hazardous workplace chemicals by using good work practices, personal protective equipment, etc.
- Emergency procedures to follow if employees are exposed to hazardous chemicals
- An explanation of our hazard communication program, including how to read labels and Material Safety Data Sheets to obtain appropriate hazard information

When a new type of product is introduced into a work area or the chemical composition of a product changes, Julie Cox will review the above items as they are related to the new chemicals.

Non-Routine Tasks

Periodically employees are required to perform non-routine tasks. Prior to starting work on such projects, each affected employee will be informed about hazards to which they may be exposed and appropriate protective and safety measures.

Informing Other Employers

To ensure that the employees of other contractors have access to information on the hazardous chemicals at a jobsite, it is the responsibility of Julie Cox to provide the other contractors the following information:

- Where the MSDS are kept
- The name and location of the hazardous chemicals to which their employees may be exposed and any appropriate protective measures required to minimize their exposure
- An explanation of the labeling system used at the jobsite

Each contractor bringing chemicals onto a jobsite must provide us with the appropriate hazard information on those substances to which our own employees may be exposed to on a jobsite.

HEAD PROTECTION

Head protective equipment (hard hats) will be worn at all times on all job sites, with the exception of equipment operators who are in a completely enclosed cab while operating their equipment. However, any time an operator exits the enclosed cab, head protection must be worn.

HEARING PROTECTION

Feasible engineering or administrative controls will be utilized to protect employees against sound levels in excess of allowable limits. When engineering or administrative controls fail to reduce sound levels to within the allowable limits, ear protective devices will be provided and used.

HEATING DEVICES, TEMPORARY

Fresh air will be supplied in sufficient quantities to maintain the health and safety of workers. Solid fuel salamanders are prohibited in buildings and on scaffolds.

HOISTS, MATERIAL AND PERSONNEL

Manufacturer's directions will be followed. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions will be posted on cars and platforms. Hoist way entrances of material hoists will be protected by full width gates or bars. Hoist way doors or gates of personnel hoists will not be less than six (6) feet six (6) inches high, and will be protected with mechanical locks that cannot be operated from landing side and are accessible only to persons on the car. Overhead protective coverings will be provided on top of hoist cages or platforms.

HORSEPLAY

Practical jokes and/or other forms of inappropriate conduct, often termed as horseplay, are forbidden on Edgerton Contractors Inc./Edgerton Trucking, Inc. premises or work sites.

HOUSEKEEPING
All work areas will be kept clean. Form and scrap lumber with protruding nails and other debris will be kept clear from all work areas. Containers will be provided for collection of refuse. Covers will be provided on containers used for flammable or harmful substances.

ILLUMINATION
Construction areas, ramps, runways, corridors, offices, shops, and storage areas, will be lighted to not less than the minimum illumination intensities listed below while work is in progress; 5 foot candles - general construction area lighting; 3 foot candles - active storage, refueling, field maintenance, loading platforms, waste areas, excavations, concrete placement areas etc.; 5 foot candles - indoor warehouse, corridors, hallways, and exit ways; 5 foot candles - tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot candles is required in tunnel and shaft heading during drilling, mucking, and scaling; 10 foot candles - general construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenters shops, rigging lofts and active store rooms, barracks or living quarters, locker or dressing rooms, mess halls, indoor toilets, and workrooms); 30 foot candles - first-aid stations, infirmaries, and offices.

LADDERS
Portable and fixed ladders with structural defects--such as broken or missing rungs, cleats or steps, broken or split rails, or corroded components, will be withdrawn from service immediately by tagging them "DO NOT USE", or marking them in a manner that identifies them as defective, or will be blocked from use. Portable, non-self-supporting ladders will be placed on a substantial base, having clear access at the top and bottom, and set at an angle so the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (also known as the 4:1 rule). Portable ladders used for access to an upper landing surfaces must extend a minimum of three (3) feet above the landing surface, (or where not practical, be provided with grab rails), and must also be secured against movement while in use. Ladders must have non-conductive side rails if they are used where the worker, or the ladder, could contact energized electrical conductors or equipment. Job-made ladder cleats will be uniformly spaced not less than 10 inches apart, nor more than 14 inches apart. Wood job-made ladders with spliced side rails must be used at an angle where the horizontal distance is one-eighth of the working length of the ladder. A ladder (or stairway) must be provided at all work points of access where there is a break in elevation of 19 inches or more, except if a suitable ramp, runway, embankment, or personnel hoist, is provided to give safe access to all elevations. Fixed ladders must be used at a pitch no greater than 90 degrees from horizontal, measured from the back side of the ladder. Ladders must be used only on stable and level surfaces unless they are secured to prevent accidental movement. Ladders must not be used on slippery surfaces unless they are secured or provided with slip-resistant feet. Slip-resistant feet must not be used as a substitute for the care in placing, lashing, or holding, a ladder upon a slippery surface.

LASERS
Only qualified and trained employees may install, adjust, and operate, laser equipment. Employees will wear proper (anti-laser) eye protection when working in areas where there is a potential of exposure to direct or reflected laser light greater than five (5) milliwatts. Beam shutters or caps will be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, it must be turned off.

LIQUIFIED PETROLEUM GAS
Each system will have containers, valves, connectors, manifold valve assemblies, and regulators, of an approved type. All cylinders will meet DOT specifications. Every container and vaporizer will be provided with one (1) or more approved safety relief valves or devices. Containers will be placed upright on firm foundations or otherwise firmly secured. Portable heaters will be equipped with an approved automatic device to shut off the flow of gas in the event of flame failure. All cylinders will be equipped with an excess flow valve to minimize the flow of gas in the event a fuel line becoming ruptured. Storage of liquefied petroleum gas within buildings is prohibited. Storage locations will have at least one (1) approved portable fire extinguisher, rated not less than 20-B:C.

LOCKOUT/TAGOUT
The Control of Hazardous Energy Source Standard (29 CFR 1910.147), which is more commonly known as the Lockout/Tagout Standard, is a requirement of OSHA. It is designed to prevent the unexpected startup, or energizing, of machinery and equipment during service and maintenance operations which could cause injury to employees. It is also designed to prevent the release of stored energy which could cause injury to employees. This standard requires isolation of machinery and equipment from its energy sources and to lock or tag them before service or maintenance

is performed. The standard also requires that all employees be trained in the company's lockout/tagout policies and procedures.

The Lockout/Tagout Standard applies if:

1. An employee is required to remove or bypass a guard or other safety device during service and maintenance of machinery or equipment.
2. An associated danger zone exists during a machine operating cycle.
3. The employee is required to place any body part into an area of the machinery or equipment where work is actually being performed upon the material being processed.

Minor tool changes, adjustments, and other minor service activities, which take place during normal production, are not included in the Lockout/Tagout Standard provided they are:

1. Routine, repetitive, and integral to the use of the equipment.
2. That these activities are performed using alternative measures which provide effective protection for the employee.

Energy Sources

There are several sources of energy and all of them are very dangerous. These sources of energy include, but not limited to:

1. Electricity
2. Thermal
3. Chemical
4. Pneumatic
5. Hydraulic
6. Mechanical
7. Gravity

It is important to remember that all sources of energy that have the potential to unexpectedly startup, energize, or release, must be identified and locked, blocked, or released, before servicing or maintenance is performed.

Equipment

The basic equipment needed for a lockout/tagout procedure are locks and/or tags. Locks are to be utilized whenever possible. Both locks and tags must clearly indicate the identity of the employee who applied the device. This provides positive identification as to who is servicing the machinery and equipment. The identification will also indicate who may not have finished working in a multiple lockout/tagout situation. The locks and tags must be durable enough to withstand the environment in which they will be used. Information on the locks and tags must remain legible. Locks must be substantial enough to prevent removal without the use of excessive force. Tags must be substantial enough to prevent accidental or inadvertent removal. Both locks and tags are to be standardized by color, shape, or size. Tags must have a standard print and format. If an energy isolating device is not capable of being locked out, a tag is to be used. An energy isolating device is simply a mechanical device that physically prevents the transmission or release of energy. All machinery and equipment must be designed to accept a lockout device when major replacements, repairs, renovations, and/or modifications of machinery or equipment are performed, or whenever new machinery is installed.

A safety audit should be conducted on all machines and equipment to identify all potentially dangerous energy sources and all energy isolating devices.

Affected and Authorized Employees

Two types of personnel are directly affected by the Lockout/Tagout Standard: Affected Employees and Authorized Employees. OSHA defines an Affected Employee as an employee whose job requires him/her to operate or use machinery or equipment on which servicing or maintenance is being performed under a lockout/tagout procedure or whose job requires him/her to work in an area in which servicing or maintenance is being performed under a

lockout/tagout procedure. OSHA defines an Authorized Employee as an employee who implements a lockout/tagout procedure on machinery or equipment in order to perform servicing or maintenance on that machinery or equipment. An Affected Employee and an Authorized Employee may be the same person.

Steps in a typical Lockout/Tagout procedure

An actual lockout/tagout procedure is simple and straightforward. There are two phases to the procedure.

Phase I – Locks, Blocks, or Releases Energy

1. The authorized employee notifies all affected employees that a lockout/tagout procedure is ready to begin.
2. The machinery or equipment is de-energized.
3. The authorized employee releases or restrains all stored energy.
4. All locks and tags are checked for defects. If any are found, the lock or tag is discarded and replaced.
5. The authorized employee places a personalized lock or tag on the energy isolating device.
6. The authorized employee tries starting the machinery or equipment to ensure that it has been isolated from its energy source. The machine is then de-energized again after this test.
7. The machinery or equipment is now ready for service or maintenance.

Phase II – Returns the Machinery or Equipment to Working Mode

1. The authorized employee checks the machinery or equipment to be certain no tools have been left behind.
2. All safety guards are checked to be certain that they have been replaced properly.
3. All affected employees are notified that the machinery or equipment is about to go back into production.
4. The authorized employee performs a secondary check of the area to ensure that no one is exposed to danger.
5. The authorized employee removes the locks and/or tags from the energy isolating device and restores energy to the machinery or equipment.

This basic example of the lockout/tagout procedure is used when only one person is performing service or maintenance on a machine or piece of equipment, and when no testing or positioning of the equipment (when two people are needed) is required.

Multiple Lockouts

In a multiple lockout/tagout procedure, each person working on a machine or piece of equipment must place a lock or tag on the energy isolating device. If the energy isolating device will not accept multiple locks or tags, a hasp (a multiple lockout device) must be used. The locks or tags must be placed in such a way that energy cannot be restored to the machine or piece of equipment until every lock or tag is removed. As each employee involved no longer needs to maintain his/her lockout/tagout protection, that employee removes his/her lock or tag. The employee attaching a lock or tag is the only person authorized to remove that lock or tag.

Testing and Positioning

Before a machine or piece of equipment can be placed back into service, the following procedure should be followed for testing or positioning machinery or equipment.

1. The authorized employee makes certain that the work area is clear of tools and materials.
2. The authorized employee notifies all affected employees that the machinery or equipment will be positioned or tested.
3. All employees leave the area.
4. Locks or tags are removed.
5. The machine or piece of equipment is started and tested or positioned.
6. When testing or positioning is complete, the machinery or equipment is de-energized following the proper lockout/tagout procedure for servicing/maintenance or, if applicable, the machine or piece of equipment is put back into normal operation.

Exemptions to Lockout/Tagout Standards

This OSHA standard covers the servicing and maintenance of machine and equipment where the unexpected energizing, startup, or release of energy could cause injury to employees. This standard applies to the control of energy during normal servicing and/or maintenance of machines and equipment. This standard does not apply to construction, installation under the exclusive control electrical utilities; exposure to electrical hazards from work on, near, or with conductors or equipment in electrical utilization installation; and oil and gas well drilling and servicing.

Inspections and Training

Each energy control procedure must be inspected at least annually for the purpose of ensuring that the requirements of the Lockout/Tagout Standard are being met. Each inspection will be conducted by and authorized employee other than the employee who normally uses the machinery or equipment, or performs the lockout/tagout procedure. Each inspection must be documented.

All employees working in an area where lockout/tagout procedures are used must be trained. Training must include the following:

1. The recognition of lockout/tagout devices and the importance of not disturbing or removing them unless authorized.
2. The safe application, use, and removal of energy controls.
3. The limitations of tags in a lockout/tagout procedure.

Training must occur whenever there is a change in job assignment, a change in machinery or equipment, an energy control procedure change, or a change in a process that presents a new hazard. Retraining is to be conducted whenever the employer believes that employees' knowledge of energy control procedures is inadequate and as part of the annual inspection.

Outside Personnel

When outside personnel, such as contractors, are on site and engaged in activities that require compliance with the Lockout/Tagout Standard, the on-site employer and the outside employer must inform one another of their lockout/tagout procedures. It is the responsibility of the on-site employer to ensure that his/her employees understand and comply with the methods of the other's lockout/tagout procedures.

Shift Changes/Personnel Changes

More often than not, accidents occur due to lack of communication. If there is a shift change or personnel change, the exiting employee(s) should meet with the oncoming employee(s) at the location of the lockout/tagout device. The oncoming authorized employee should place his/her lock or tag on the energy isolating device before the exiting authorized employee removes his/her lock or tag. If this is not possible, the oncoming authorized employee should place his/her lock or tag on the energy isolating device immediately after the exiting authorized employee removes his/her lock or tag. Exiting employees should inform the oncoming employees of any problems or concerns regarding the service and maintenance of machinery or equipment.

MEDICAL SERVICES AND FIRST AID

When a medical facility is not reasonably accessible (within five (5) miles), a person trained to render first aid and first aid supplies must be available at the worksite. The telephone numbers of local physicians, hospitals, and/or ambulances, must be conspicuously posted.

MOTOR VEHICLES AND MECHANIZED EQUIPMENT

All vehicles will be checked at the beginning of each shift to ensure that all parts, equipment, and accessories, affecting safe operation, are in proper operating condition and free from defects. All defects will be corrected before the vehicle is placed in service. No one will use any motor vehicle, earthmoving equipment, or compacting equipment, having an obstructed rear view unless; the vehicle has a reverse signal alarm distinguishable from surrounding noise level; or the vehicle is backed up only when an observer (spotter) signals that it is safe. Heavy machinery, equipment,

or parts thereof, suspended or held aloft, will be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

PERSONAL PROTECTIVE EQUIPMENT

Employees are responsible for wearing appropriate personal protective equipment in all operations where there is possible exposure to hazardous conditions or where a need is indicated for using PPE to reduce hazards to employees. Employees working over or near water, where danger of drowning exists, will be provided with U.S. Coast Guard-approved life jackets or buoyant work vests. Edgerton Contractors, Inc./Edgerton Trucking, Inc. requires that all employees working or visiting jobsites must wear high-visibility safety vests, safety glasses, hard hats, and safety-toe boots or shoes, along with any other necessary personal protective equipment necessary, depending on the type of work being performed. Employees working in the shop are also required to wear safety-toe boots or shoes, along with any other necessary personal protective equipment necessary, depending on the type of work being performed.

POWDER-ACTUATED TOOLS

Only trained employees will be allowed to operate powder-actuated tools. Powder-actuated tools will be tested daily before use and all defects discovered before or during use will be corrected. Powder-actuated tools will not be loaded until immediately before use. Loaded powder-actuated tools will not be left unattended for any reason.

POWER TRANSMISSION, MECHANICAL

Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment, will be guarded if such parts are exposed to contact by employees, or may otherwise constitute a hazard.

RAILINGS

A standard railing will consist of a top rail, intermediate rail, toe board, and posts, and will have a vertical height of approximately 42 inches from the upper surface of the top rail to the floor or platform. The top rail of a railing will be smooth-surfaced, with strength to withstand at least 200 pounds applied in any direction, at any point on the top rail, with minimum deflection. The intermediate rail will be halfway between the top rail and floor. A stair railing will consist of construction similar to a standard railing with a vertical height of 36 inches from the upper surface of the top rail to the surface of the tread in line with the face of the riser at the forward edge of the tread.

RESPIRATORY PROTECTION

In emergencies, or when feasible engineering or administrative controls are not effective in controlling toxic substances, approved respiratory protective equipment for a specific contaminant to which employees are exposed, or could be exposed, will be provided and used. Employees required to use respiratory protective devices will be evaluated by a physician, or other licensed health care professional, fit tested in the protective device to be used, and thoroughly trained in its use before using the device. Respiratory protective equipment will be inspected regularly and maintained in good condition. In addition, employees who are not required, but opt to use filtering face pieces for comfort, must be made aware of the restrictions of the device, how it is to be used, and given a copy of Appendix D of the OSHA standard on Respiratory Protection. (See below for Appendix D)

Appendix D to Sec. 1910.134 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies

respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

ROLLOVER PROTECTIVE STRUCTURES (ROPS)
Rollover protective structures (ROPS) must be used on the following types of materials handling construction equipment: all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders.

SAFETY PROGRAMS/SAFETY TRAINING
Edgerton Contractors Inc./Edgerton Trucking, Inc. makes available, free of charge, safety training programs covering construction hazards. All employees are requested to actively participate in these programs, or in training through your union office. Please see the chart below for OSHA-required training, your union office may require other training and/or more frequent re-training.

Weekly safety meetings ("toolbox talks/tailgate meetings") will be held every Monday morning prior to the start of the work day, on any/all job sites. Safety topics are provided to the supervisors of each job site and each worker must sign-in, acknowledging they understood the safety topic discussed. These weekly safety topic/sign-in sheets must be turned in to the Safety Manager on a weekly basis. If the supervisor wants to discuss another topic, i.e. safety issues on the job site, upcoming work to be performed, or another relevant safety topic, the supervisor will make note on the sign-in sheet what was discussed at that meeting before turning it in to the Safety Manager.

OSHA-REQUIRED SAFETY TRAINING

	NEW HIRE TRAINING	PRIOR TO USE/EXPOSURE	REFRESHER	CERTIFICATION	RECERT.
Access to Employee Exposure and Medical Records	X		ANNUAL		
Asbestos Hazards		X	ANNUAL		
Bloodborne Pathogens		X	ANNUAL		
Confined Space Entry		X	AS NECESSARY		
CPR/First Aid				X	EVERY 2 YEARS
Electrical Training		X	AS NECESSARY		
Emergency Action Plan	X		WHEN CHANGED		
Excav. Comp. Person		X	AS NECESSARY		
Fall Protection		X	AS NECESSARY		
Fire Extinguishers		X	ANNUAL		
Fire Prevention/Fire Watch	X		AS NECESSARY		
Flammable/Combustible Liquids		X	AS NECESSARY		
Forklift Operation				X	EVERY 3 YEARS
General Safety & Health	X				
Hazard Communication	X	X			

HAZWOPER				**X**	**ANNUAL**
Hearing Protection	**X**		**ANNUAL**		
How to Report Injuries/Illnesses	**X**				
Lead Exposure		**X**	**ANNUAL**		
Lockout/Tagout		**X**	**AS NECESSARY**		
LP Gas Handling		**X**	**AS NECESSARY**		
OSHA 10-Hr.				**X**	
OSHA 30-Hr.				**SUPERVISORY PERSONNEL**	
Personal Protective Equipment	**X**		**AS NECESSARY**		
Personnel Lifts		**X**	**EACH OCCURRENCE**		
Powered Platforms		**X**	**AS NECESSARY**		
Respirators		**X**	**ANNUAL**		
Safety Training & Educ.	**X**				
Stairs & Ladders	**X**		**AS NECESSARY**		
Welding Safety		**X**	**AS NECESSARY**		

SCAFFOLDS

Use - Scaffolds shall not be loaded in excess of maximum intended loads or rated capacities. Inspect and repair scaffolds before each work shift, and after any occurrence which could affect integrity. Clearance between scaffolds and power lines shall be as follows: Less than 300 volts - 3' if insulated line - 10' if uninsulated, 300 to 50kv - 10', over 50 k.v - 10' plus 4" for every kv over 50. Erect, move, dismantle, or alter scaffolds only under supervision and direction of a qualified competent person. Shield suspension ropes from heat-producing processes. When acids or other corrosive substances are used on a scaffold, ropes shall be shielded or treated to protect against corrosive substances. Do not allow debris to accumulate on platforms. Do not use makeshift devices on top of scaffold platforms to increase working height. Do not use ladders on scaffolds to increase working level height. Platforms may not deflect more than 1/60 of the span when loaded.

Fall protection - Protect employees on scaffolds more than 10 feet above a lower level from falling by the use of a fall arrest system. Employees on single-point or two-point adjustable suspension scaffolds need both personal fall arrest systems and guardrail systems. Employees on a crawling board need a personal fall arrest system, a guardrail system, or a three-fourth inch diameter grab line or equivalent handhold securely fastened beside each crawling board. Install guardrail systems along open sides and ends of platforms. Top edge height of top rails on supported scaffolds manufactured or placed in service after January 1, 2000 shall be between 38 inches and 45 inches above platform surface. Top edge height on supported scaffolds manufactured and placed in service before January 1, 2000, and on all suspended scaffolds shall be between 36 inches and 45 inches. Cross bracing is acceptable in place of a mid-rail when the crossing point of two (2) braces is between 20 inches and 30 inches above work platform, or as a top rail when the crossing point of two (2) braces is between 38 inches and 48 inches. End points at each upright shall be no more than 48 inches apart.

Falling object protection - In addition to hardhats, protection from falling objects must be provided through installation of toe boards, screens, or guardrail systems, or through erection of debris nets, catch platforms, or canopy structures. When falling objects are too large, heavy or massive to be contained, place and secure them away from edge of any/all surface(s) from which workers could fall. Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, barricade the area below, or erect a toe board along edge of platforms. Where tools, materials, or equipment are piled higher than the toe board, paneling or screening extending from toe board or platform to the top of the guardrail shall be erected, a guardrail system installed with openings small enough to prevent passage of potential falling objects; or a canopy structure, debris net, or catch platform shall be erected

over employees below. When canopies are used on suspension scaffolds for falling object protection, equip scaffolds with additional independent support lines equal in number to points supported, and equivalent in strength to suspension ropes. Do not attach independent support lines and suspension ropes to the same points of anchorage. Toe boards must withstand a force of at least 50 pounds applied in any direction. Toe boards must be at least three and one-half (3-1/2) inches high and securely fastened with not more than 1/4 inch clearance above walking/working surface.

Aerial lifts - Test lift controls each day prior to use to assure controls are in safe working condition. Employees shall always stand firmly on floor, and may not sit or climb on edge of basket or use planks, ladders, or other devices for work position. A safety harness with a lanyard attached to boom or basket is required when working from an aerial lift. Brakes will be set and any outriggers positioned on pads or a solid surface. Wheel chocks will be installed before using an aerial lift on an incline (provided they can be safely installed). Aerial lift trucks are not to be moved with booms elevated in a working position and workers in the basket. Articulating boom and extensible boom platforms, primarily designed as personnel carriers, need platform (upper) and lower controls. Upper controls are to be in/beside the platform and within easy operator reach. Lower controls shall override upper controls. Lower level controls are not operated without the permission of the employee in the lift, except in an emergency.

STAIRS

A stairway or ladder must be provided at points of access where there is a break in elevation of 19 inches or more. Except during construction of a stairway, skeleton metal frame structures and steps must not be used, unless the stairs are fitted with secured temporary treads and landings. When there is only one (1) point of access between levels, it must be kept clear to permit free passage. When there are more than two (2) points of access between levels, at least one (1) point of access must be kept clear. Stairways that will not be permanent must have landings at least 30 inches deep and 22 inches wide at every 12 feet or less of vertical rise. Stairways must be installed between 30 and 50 degrees, from the horizontal. Variations in riser height, or stair tread, or landing depth, must not exceed 1/4 inch in any stairway system, including any foundation structure used as one (1) or more treads of the stairs. Where doors or gates open directly onto a stairway, a platform must be provided. The swing of the door may not reduce effective width of the platform to less than 20 inches. Except during construction of a stairway, stairways with metal pan landings and treads must not be used where treads and/or landings have not been filled in with concrete or other material, unless pans of stairs and/or landings are temporarily filled in with wood or other material. All treads and landings must be replaced when worn below top edge of pan. Stairways having four (4) or more risers, or more than 30 inches in height whichever is less, must have at least one (1) handrail. A stair rail also must be installed along each unprotected side or edge. When the top edge of a stair rail system also serves as a handrail, the height of the top edge must not be more than 37 inches, nor less than 36 inches, from the upper surface of the stair rail to the surface of the tread in line with the face of the riser at the forward edge of tread. Winding and spiral stairways must be equipped with a handrail, offset sufficiently to prevent walking on those portions where the tread width is less than six (6) inches. Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, must be provided between the top rail and the stairway steps. Mid-rails must be located midway between the top of the stair rail system and the stairway steps. The height of the handrails must not be more than 37 inches, nor less than 30 inches from the upper surface of the handrail to the surface of the tread in line with the face of the riser at the forward edge of the tread. The height of the top edge of a stair rail system used as a handrail must not be more than 37 inches, nor less than 36 inches, from the upper surface of the stair rail system to the surface of the tread in line with face of the riser at the forward edge of the tread. Temporary handrails must have a minimum clearance of three (3) inches between the handrail and walls, stair rail systems, and other objects. Unprotected sides and edges of stairway landings must be provided with a standard 42-inch guardrail systems.

STEEL ERECTION

Prior to Start-up- Approval to begin steel erection activities must be given and/or received prior to any work commencing. Adequate roads and/or staging areas will be available for safe erection. Hoisting and overhead movement of steel shall be pre-planned to reduce the number of exposed workers to a minimum.

Hoisting and Rigging- All cranes and hoists shall be thoroughly inspected prior to use. All rigging shall be inspected by a qualified rigger. Crane supported work platforms will be used only in strict compliance with OSHA standards 1926.550(g).

STORAGE

Materials stored in tiers will be secured to prevent sliding, falling, or collapsing. Aisles and passageways will be kept clear and in good repair. Storage of materials may not obstruct exits. Materials will be stored with regard to their fire characteristics.

THEFT
Theft of any Edgerton Contractors Inc./Edgerton Trucking, Inc. owned equipment or materials, or the unauthorized removal of equipment or materials from a jobsite, shall be cause for immediate dismissal.

TOEBOARDS (Floor and Wall Openings and Stairways)
Equip railings protecting floor openings, platforms, and scaffolds, with toe boards wherever, beneath open side, persons can pass, there is moving machinery, or there is equipment with which falling materials could cause a hazard.

TOILET FACILITIES (JOB SITES)
Per OSHA regulations, toilets will be provided at the rate of one (1), set up for both men and women, per every 10 employees on a work site.

UNDERGROUND CONSTRUCTION
A safe means of access and egress will be maintained to all work stations. Access to all openings will be controlled to prevent unauthorized entry. Unused chutes, man ways, or other openings, will be tightly covered, bulk headed, or fenced off, and will have danger/warning signs posted. Complete or unused sections of underground facilities will be barricaded. Unless sufficiently completed so permanent environmental controls are effective and remaining construction activity will not cause any hazard, there will be a check-in/check-out procedure to ensure an accurate count of persons underground. A competent person will be assigned to perform air monitoring to determine proper ventilation and quantitative measurements of potentially hazardous gases. Fresh air will be supplied to underground work areas to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

WALL OPENINGS
Wall openings, from which there is a drop of more than six (6) feet, and the bottom of the opening is less than 39 inches above the working surface, will be properly guarded.

WELDING, CUTTING, HEATING
Proper eye protective equipment to prevent exposure of personnel will be worn. Precautions (isolating welding and cutting, removing fire hazards, providing a fire watch) for fire prevention will be taken where welding or other "hot work" is being done. No hot work will be done where flammable paints, or flammable compounds or heavy dust concentrations create a fire hazard. Arc welding and cutting operations will be shielded by non-combustible or flame-proof screens to protect workers from the direct arc rays. Electrode holders are not to be left unattended, unless electrodes are removed and holder is placed or protected so it cannot make electrical contact with employees or conducting objects. Arc welding and cutting cables will be completely insulated and capable of handling maximum current requirements. There will be no repairs or splices within 10 feet of electrode holder, except where splices are insulated equal to the cable insulation. Defective cable will be repaired or replaced. Fuel gas and oxygen hoses will be easily distinguishable and not interchangeable. Hoses will be inspected at the beginning of each shift and repaired or replaced if found defective. General mechanical ventilation, local exhaust ventilation, air line respirators, and other protection, will be provided when welding, cutting, or heating zinc, lead, cadmium, chromium, mercury, or any materials based with or coated with, beryllium in enclosed spaces, stainless steel with inert-gas equipment in confined spaces, and/or where an unusual condition can cause unsafe contaminant accumulation.

WIRE ROPES, CHAINS, SLINGS
Inspect wire ropes, chains, slings, and rigging equipment, prior to use and as necessary during use. Defective gear will be removed from service. Job or shop hooks and links or makeshift fasteners formed from bolts, rods, or other attachments, will not be used. U-bolts used for eye splices will be applied so the "U" section is in contact with dead end of rope.

JOB SITE REQUIREMENTS

Depending on the owner's wishes, each jobsite may have some different rules or expectations pertaining to safety, usually more stringent, however, under no circumstances will any OSHA rules/regulations be ignored. Following is a summary of safety-related requirements that must be followed at all jobsites:

- ✓ Weekly safety talks/discussions will be held each Monday morning prior to the start of the workday. The safety talk sheets will be signed by each attendee. These sheets must be turned in to the safety manager each week.
- ✓ Proper personal protective equipment will be worn at all times, as indicated above.
- ✓ Daily equipment inspections must be conducted and logged on the equipment inspection forms.
- ✓ If any piece of equipment or tool is defective, or is not working properly, it must be tagged "DO NOT USE" and taken out of service immediately.
- ✓ Any near misses, injuries, illnesses, accidents, and/or property damage that occur on a jobsite must be reported immediately to a supervisor, and to the safety manager.
- ✓ Any/all applicable rules and regulations will be followed at all times.

ACCIDENT INVESTIGATION

"Those who do not learn from the past are condemned to repeat it." Each and every accident must be investigated. An accident is any unplanned occurrence that could have caused injury or damage, not just occurrences that did. If a sling breaks and drops a load, it is an accident whether anyone was hurt or not.

Accidents should be investigated by immediate supervision. Results should be reported completely on a standard Edgerton Contractors Inc./Edgerton Trucking, Inc. incident/accident form. (See FORMS section of this policy.)

The immediate supervisor's report should be reviewed by the safety manager. Appropriate steps to prevent reoccurrence should be taken.

Accident reports highlight problem areas. Patterns can be detected and resources directed towards preventing a reoccurrence. Accident reports make excellent training tools. The causes and effects of accidents can be reviewed at safety meetings.

COMPANY SAFETY COMMITTEE

As part of our continued commitment to safety, Edgerton Contractors, Inc./Edgerton Trucking, Inc. utilizes the help of a group of seven (7) employees who meet once per month for the purpose of:

1. Increasing and maintain interest of employees in health and safety issues.
2. To help managers, supervisors, and workers, understand through awareness and training activities that they are primarily responsible for the prevention of workplace accidents.
3. To help make health and safety activities an active part of the company's operating procedures, culture, and programs.
4. To provide opportunity for the free discussion of health and safety problems and possible solutions.
5. To inform and educate employees and supervisors about health and safety issues, new standards, policies, the latest research findings, etc.
6. To help reduce the risk of workplace injuries and illnesses.
7. To help insure compliance with federal and state health and safety standards.

The members of the safety committee will rotate annually to give all employees the opportunity to be a part of this effort.

<u>FORMS</u>

Edgerton Contractors, Inc./Edgerton Trucking, Inc. have created the following forms which are to be used where applicable. A sample of each form will follow the list.

1. Accident/Incident Report
2. Daily Equipment Inspection Report
3. Job Hazard Analysis
4. Site Safety Inspection Record
5. Pre-Project Checklist

EDGERTON CONTRACTORS/EDGERTON TRUCKING
INCIDENT/ACCIDENT REPORT

TODAY'S DATE: _____ JOB NAME:_____

PERSON GIVING REPORT: _____ JOB#:_____

DATE OF INCIDENT: _____

TIME OF INCIDENT: _____

TYPE OF INCIDENT/ACCIDENT:

INJURY _____ PROPERTY DAMAGE _____ ILLNESS _____ NEAR MISS _____ THEFT _____

EXACT LOCATION OF INCIDENT:
_____

_____

WITNESSES: (EACH WITNESS MUST GIVE A WRITTEN STATEMENT, IF POSSIBLE)

_____

_____

DETAILED DESCRIPTION OF INCIDENT:

_____

_____

_____

WHO WAS INVOLVED AND HOW?
_____

_____

PROPERTY DAMAGE? TYPE? HOW?
_____

_____
_

REPAIRS NEEDED? WHO? WHERE?
_____

_____
_

OTHER COMMENTS:
_____

_____
_

_____
SIGNATURE OF PERSON COMPLETING REPORT

DAILY EQUIPMENT INSPECTION CHECKLIST	
Contractor: ***Edgerton Contractors, Inc.***	Project:
Unit Number:	Equipment Type/Model:
Date Week Ending:	Operator:

INSPECTION ITEMS	MON	TUE	WED	THU	FRI	SAT	COMMENTS	OP- INIT
1. Steering								
2. Wheels – Tires and Rims, Tire Pressure								
3.Glass surfaces – Windows/Mirrors								
4.Electrical System – Lights, Alternator, Wiring, Etc.								
5. Safety Equipment (back alarm, horn, seatbelt, lap bar, flashing beacon, etc.)								
6. No overall damages noted								
7. Fluid levels adequate, and no leaks noted								
8. Moisture drained from air tanks (if equipped)								
9. Check for loose bolts, hose chafing, and coupling devices								
10. Check intake and exhaust systems – free of obstructions								
11. Fire extinguisher – fully charged								
12. Misc. equipment/forks								
13. Grease								
14. Tracks, loose pads, track tension								

Supervisor Signature:	**Date completed/Turned in:**

EDGERTON CONTRACTORS SITE SAFETY INSPECTION REPORT

Date:_____ **Job Name/Location:** _____

Time: _____

Weather: _____

CATEGORIES	SAFE	AT-RISK	COMMENTS
General Site Conditions:			
Walking/Working Surfaces	_____	_____	
Barricades/Fencing	_____	_____	
Housekeeping:			
Trash pick-up	_____	_____	
Material/Equip. storage	_____	_____	
Toilet facilities	_____	_____	
Equip./Office trailer	_____	_____	
Tools/Equipment:			
Vehicles-			
Operation	_____	_____	
Maintenance	_____	_____	
Fire Extinguishers	_____	_____	
Tools	_____	_____	
Electrical cords	_____	_____	
Personal Protective Equip.			
Safety glasses/Face shield	_____	_____	
Hard hat	_____	_____	
Gloves	_____	_____	
Safety-toe boots/shoes	_____	_____	
High-Vis. Safety vest	_____	_____	
Hearing protection	_____	_____	
Respiratory protection	_____	_____	
Fall protection	_____	_____	
Worker Behavior			
Cell phone use	_____	_____	
Shortcuts/Haste	_____	_____	
Horseplay	_____	_____	

_____ _____

Inspector Name (Print and Sign) **Inspector Title**

A copy of this inspection report to be given to the Safety Manager.

EDGERTON CONTRACTORS, INC.
JOB HAZARD ANALYSIS

JOB NAME:	**DATE OF ANALYSIS:**
JOB LOCATION:	**PERSON COMPLETING ANALYSIS:**

STEP	HAZARD	SAFE PROCEDURE

EDGERTON Contractors, Inc.

Print Form | Submit by Email

Project Start-up Checklist

Project Information

Number _____

Name _____

Location _____

(If there is/will be more than one subcontractor, please list the information on the last page of this form.)

Project Manager _____

Project Foreman _____

Competent Person _____

Subcontractor _____

Sub Contact _____

Sub Contact # _____

A. Site (General)

1. Do the plans and drawings match what the site looks like?

☐ Yes ☐ No ☐ N/A

If no, what is different? _____

2. Do the plans show everything needed?

☐ Yes ☐ No ☐ N/A

If not, please list what else is needed. _____

3. Has a pre-construction topography been completed ?

☐ Yes ☐ No ☐ N/A

B. Clearing and Grubbing

1. Are limits of clearing and grubbing clearly defined?

☐ Yes ☐ No ☐ N/A

2. Are the limits shown on the plans?

☐ Yes ☐ No ☐ N/A

3. Are there any utilities that conflict with clearing or grubbing?

☐ Yes ☐ No ☐ N/A

C. Training/Briefing

1. Does this project require any special training of workers?

☐ Yes ☐ No ☐ N/A

If yes, please list type(s) of training needed. _____

2. Was a project briefing conducted with all workers involved?

☐ Yes ☐ No ☐ N/A

If yes, please give date: _____

If no, please explain: _____

3. Did all workers attend the safety orientation?

☐ Yes ☐ No ☐ N/A

4. Has the Safety Manager been informrd of this project?

☐ Yes ☐ No ☐ N/A

D. Soil Classification

1. Does the depth of topsoil and/or vegetation match the soil borings?

☐ Yes ☐ No ☐ N/A

2. Based on the boring logs <u>and</u> visual observation, which best describes the soil in this excavation?

☐ Type A ☐ Type B ☐ Type C ☐ Stable Rock

3. Based on the boring logs <u>and</u> visual observation, which best describes the moisture condition of the soil?

☐ Dry ☐ Moist ☐ Wet ☐ Saturated

4. Based on at least one <u>manual</u> test, what is the classificaion of the soil in this excavation?

☐ Type A ☐ Type B ☐ Type C ☐ Stable Rock

5. What manual test was used to determine the soil type?

☐ Thumb Penetration ☐ Penetrometer

☐ Ribbon Test ☐ Other _____

Edgerton Contractors, Inc. * 6466 S. 12th Street * Oak Creek *WI 53154 * Phone: 414.764.4442 Fax: 414.764.9788 * www.edgertoncontractors.com

6. Can a safe slope be achieved depending on site and soil conditions?

☐ Yes ☐ No ☐ N/A

7. If excavation is deeper than four (4) feet and sloping is to be steeper than a 1.5:1, has condition been reviewed with the safety manager and has a plan for daily inspection been developed?

☐ Yes ☐ No ☐ N/A

8. Will the excavation be a depth of 20 feet or greater?

☐ Yes ☐ No ☐ N/A

9. If depth is 20 feet or greater, has the excavation been designed and stamped by a registered professional engineer?

☐ Yes ☐ No ☐ N/A

10. Are there structures, pavements, etc., within that will require protection, shoring, etc.?

☐ Yes ☐ No ☐ N/A

If yes, explain conflict and plan? _____

_____

_____

_____

E. Contaminated Soil

1. Are contaminates identified in the plans/specs?

☐ Yes ☐ No

2. Who is responsible for classification of contaminate(s)?

_____

3. Where will the contaminated material be disposed of ?

_____

4 Who is responsible for the disposal of contaminated materials?

_____

5. Is there an emergency action plan in place in case of a spill of contaminated material?

☐ Yes ☐ No ☐ N/A

6. Who is responsible for the implementation plan?

_____

7. Are there any special personal protective equipment (PPE) requirements for working with this material?

☐ Yes ☐ No Type? _____

8. Are workers trained and current in HAZMAT/HAZWOPER?

☐ Yes ☐ No ☐ N/A

9. Has a tool box talk been conducted to discuss hazard/protection with employees?

☐ Yes ☐ No ☐ N/A

F. Drainage

1. Is there drainage across the property now?

☐ Yes ☐ No ☐ N/A

2. Is the drainage accounted for in the plans?

☐ Yes ☐ No ☐ N/A

3. Will drainage be discharged into wetlands or waterways?

☐ Yes ☐ No ☐ N/A

4. Will flow need to be continued during construction?

☐ Yes ☐ No ☐ N/A

5. Will temporary structures be needed?

☐ Yes ☐ No ☐ N/A

6. Are private easements involved?

☐ Yes ☐ No ☐ N/A

7. Chapter 30 permits needed?

☐ Yes ☐ No ☐ N/A

8. Has an ECIP been submitted and approved?

☐ Yes ☐ No ☐ N/A

G. Utilities

1. Are there any underground utilities in the area of this excavation project?

☐ Yes ☐ No ☐ N/A

If yes, are the utilities:

☐ Public owned ☐ Privately owned

(Please note: if utilities are privately owned, the owner is responsible for the location/marking of any/all utilities.)

2. If utilities are public owned, has Diggers Hotline been contacted?

☐ Yes ☐ No ☐ N/A

3. Have all public <u>and</u> private utilities been located and marked?

☐ Yes ☐ No ☐ N/A

By whom: _____

When: _____

4. What types of utilities were located/marked? *(Place an "X" next to any/all found.)*

☐ Electrical ☐ Cable

☐ Telephone ☐ Water/Sewer

☐ Gas ☐ Fiber Optic

5. Have pictures been taken of all markings prior to excavation?

☐ Yes ☐ No ☐ N/A

6. Is a "watch dog" required for utilities?

☐ Yes ☐ No ☐ N/A

7. Describe any utility/excavation conflict(s): _____

_____

_____

_____

_____

8. Do any utilities need to be supported?

☐ Yes ☐ No ☐ N/A

9. Can the utilities be re-routed?

☐ Yes ☐ No ☐ N/A

10. Can the utilities be de-energized?

☐ Yes ☐ No ☐ N/A

11. Are there any overhead utility dangers on this site?

☐ Yes ☐ No ☐ N/A

12. Have all workers been informed/trained in working near overhead and underground utilities?

☐ Yes ☐ No ☐ N/A

13. Inspect all manholes, drop inlets, or other structures. Note the size, structure type, materials, depth, number of inlets and outlets, their locations, approximate flow, any possible obstructions. Check condition of structures and castings. Note any issues.

H. Vehicular/Pedestrian Traffic

1. Are there any dangers of vehicular/pedestrian traffic near this excavation?

☐ Yes ☐ No ☐ N/A

2. Are flaggers required?

☐ Yes ☐ No ☐ N/A

3. Is fencing needed for the site?

☐ Yes ☐ No ☐ N/A

4. Is traffic control required?

☐ Yes ☐ No ☐ N/A

5. Are there haul route restrictions, such as bridges, weight limits, etc.?

☐ Yes ☐ No ☐ N/A

6. Will noise be a problem to surrounding neighborhoods?

☐ Yes ☐ No ☐ N/A

7. Are there any special requirements for equipment deliveries, e.g., route, escort, load assist, etc.?

☐ Yes ☐ No ☐ N/A

I. Fall Protection

1. Will there be any activities that will require workers to be at a height of six (6) feet or greater?

☐ Yes ☐ No ☐ N/A

If yes, has fall protection been planned/ordered?

J. Hazard Communication

1. All subcontractors must turn in a copy of all MSDS sheets for hazardous chemicals/gases that may be brought onsite. These copies must be kept onsite for review by anyone (workers and/or visitors) who may need them. Have all subcontractors been notified where MSDS sheets are kept onsite?

☐ Yes ☐ No ☐ N/A

Where will all MSDS sheets be kept on site? _____

K. Asbestos

1. Are there any indications that there is/could be asbestos on this site?

☐ Yes ☐ No ☐ N/A

2. Are workers on this site trained in asbestos?

☐ Yes ☐ No ☐ N/A

If no, has training been scheduled with safety manager?

☐ Yes ☐ No ☐ N/A

L. Hot Work

1. Is proper eye protection being used?

☐ Yes ☐ No ☐ N/A

2. Are leather welding gloves being used?

☐ Yes ☐ No ☐ N/A

3. Are there respiratory hazards from galvanizing, lead paint, etc.?

☐ Yes ☐ No ☐ N/A

4. Are respiratory PPE devices being used?

☐ Yes ☐ No ☐ N/A

5. Employees who are to wear respirators must be fit-tested and assessed by a physician. Has this been completed?

☐ Yes ☐ No ☐ N/A

6. Is a hot work permit required on this project?

☐ Yes ☐ No ☐ N/A

7. Are there backflow prevention devices in place on tanks?

☐ Yes ☐ No ☐ N/A

8. Are strikers available for lighting torches?

☐ Yes ☐ No ☐ N/A

M. Rigging Safety

1. Has all rigging equipment been thoroughly inspected prior to use?

☐ Yes ☐ No ☐ N/A

2. Has all rigging equipment in need of repair or destruction been tagged "Do Not Use" and sent to shop for proper care?

☐ Yes ☐ No ☐ N/A

3. Any "riggers" (persons assisting operators with rigging) need appropriate documented training. Has this been completed?

☐ Yes ☐ No ☐ N/A

N. Confined Space

If a trench is four (4) feet or more deep, and someone will be working in the trench, it may be considered a confined space. There must also be a ladder for access and egress placed in the trench within 25 ft. of worker(s). Atmospheric testing must be conducted before and during entry, with documentation, into any confined space.

1. Has confined space training been completed?

☐ Yes ☐ No ☐ N/A

2. Is there an atmospheric tester onsite?

☐ Yes ☐ No ☐ N/A

3. Is a safety harness and lifeline available?

☐ Yes ☐ No ☐ N/A

4. Is there a ladder for access and egress available?

☐ Yes ☐ No ☐ N/A

O. Assured Equipment Grounding

1. Have all electrical cords on power tools and extension cords been inspected and marked with the proper color tape?

☐ Yes ☐ No ☐ N/A

2. Have all electrical cords/extension cords in need of repair been tagged "Do Not Use" and sent to the shop for repair?

☐ Yes ☐ No ☐ N/A

P. Emergency Procedures

1. Have all workers been informed of emergency procedures for this site?

☐ Yes ☐ No ☐ N/A

2. Have all workers been informed of incident/accident reporting procedures?

☐ Yes ☐ No ☐ N/A

3. Has the nearest medical facility been located and a map posted?

☐ Yes ☐ No ☐ N/A

Notes:

Estimator _____ Date _____

Proj. Mgr. _____ Date _____

Supv/Foreman _____ Date _____