



Safety Program

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I. Introduction:

Grade Tech Services is committed to safe work practices. Safety first and foremost protects against injuries and allows all employees to live happy healthy lives. We also adamantly believe that defending against accidents makes projects more efficient and profitable. Adherence to this program will benefit everyone involved with Grade Tech Services by continuing to provide a safe work environment.

II. Assignment of Responsibility:

Employer: Grade Tech Services will monitor the effectiveness of this program and make changes to further benefit employees yearly or more often if needed. It will provide personal protective equipment, protective systems, testing, and training to ensure employees are well-cared for and safe. It will make sure supervisors are completing their responsibilities in regards to this program and will investigate all accidents.

Supervisors: All managing positions will keep current on training. They will conduct daily "Take 5" safety meetings as well as discuss safety topics twice weekly as described in this program. They will participate in conference calls with other supervisors daily, and continually mentor newer employees on safe work practices. They will fill out proper method of procedure documents, incident reports as well as any other safety oriented documents outlined in this program.

Employees: All employees will keep current on training and attend the daily "Take 5" safety meeting before starting work each day. Employees will also report hazardous practices and report incidents to their supervisors.

III. New Hire Procedure & Training:

New employees have the highest risk of being in an accident on the job. Grade Tech Services specifically works with new hires to ensure they have the proper training and equipment to work safely.

Fit-for-Duty: Before employment, the worker must pass the following fit-for-duty screens:

- **Pre-hire drug screen:** A urine test must be completed within 48 hours of the job offer. Grade Tech Services will contract the screening through Intermountain WorkMed services.
- **Personal driving record:** An employee must not have a DUI on their record within the past seven years.

- **Criminal history record:** Grade Tech Services may conduct a back ground check if they feel necessary. Safety begins with level-headed minds, and employees showing histories with excess anger towards others or recklessness will not be hired.

Orientation: New hires will receive the Grade Tech Services safety manual, a copy of this safety program, proper personal protective equipment and a 6-hour orientation given online through clicksafety.com and in-office PowerPoints and quizzes. The online orientation, presentations and quizzes must be completed in the presence of a qualified GTS supervisor before the employee is allowed to set foot on a jobsite. The orientation contains the following topics.

- GTS Safety Program
- General Safety
- Company Rules
- Safety Meetings
- Reporting Unsafe Conditions
- Trench/Excavation safety
- Proper use of Personal Protective Equipment
- Overhead Power & Electrical Safety
- Confined Spaces Safety
- Slips and Falls prevention
- Spotting Techniques
- Machinery and Equipment Safety
- Proper use of Ladders, Scaffolds, Platforms, and Safety Harnesses
- Hand and Portable Electric Tools Safety
- Fire and Flammable Materials Safety
- First Aid
- Housekeeping
- Hazardous Substances
- Medical Treatment/Injury Reports
- New Hire Training Program

OSHA 10-Hour course: New hires are also required to complete the OSHA 10-Hour course within the first 90 days of employment or face termination. The course will be completed using clicksafety.com.

Daily Training: Supervisors will identify hazards of daily tasks at the beginning of each day during the “Take 5” meeting. As part of this daily orientation, supervisors will make sure that workers new to the crew receive a site walk down with the supervisor to review hazards and site conditions.

IV. Employee Training:

Safety hazards change with each jobsite and task. Aside from initial training, Grade Tech Services continually trains employees on specific topics.

OSHA 10-Hour course: All employees are required to complete the OSHA 10-hour course within 90 days of employment at Grade Tech Services. This course will be completed online using clicksafety.com

OSHA 30-Hour course: Employees in supervisor positions must complete the OSHA 30-Hour course prior to leading a team and conducting safety meetings. These courses will be completed online using clicksafety.com.

On-going Instruction: Each month all employees will be required to take a 1-2 hour course online at clicksafety.com that is specialized to address safety concerns on current or upcoming projects.

V. General Safety Procedure:

“Take 5” for Safety: Before each workday when the crew arrives on the jobsite and after lunch the supervisor will lead the team in a “Take 5” safety meeting. The supervisor will address the day’s tasks as well as associated hazards and defense controls. Each employee is required to attend this meeting and sign the “Take 5” document that the supervisor fills out. During the “Take 5” is also when supervisors will present special safety topics twice weekly. (A copy of this document is found at the end of this program.)

Supervisor Conference Calls: Each day after the “Take 5” meetings, the supervisors on each jobsite will participate in a conference call. During this call the leaders will discuss what was covered in the “Take 5” meetings, as well as any other safety concerns. On Mondays and Thursdays one supervisor will be assigned to research a safety topic during the conference call. This topic may concern a near miss or a possible hazard that was spotted on a jobsite (see next paragraph.)

Safety Topics (Toolbox): A supervisor will be assigned a safety topic twice weekly, (on Monday and Thursday during the conference call). The assigned supervisor will then research the topic (<http://www.toolboxtopics.com/Construction/index.htm>) and disseminate the information to the other supervisors by the end of the day. All supervisors will read about the safety topic and present it during the “Take 5” meeting the following day (Tuesday and Friday respectively). This safety topic presentation should allow for discussion among the employees to resolve any questions they may have.

Accident Investigations: In the occurrence of an incident that results in injury to workers, as well as near misses, regardless of their nature, the supervisor on site will fill out an OSHA Form 301 Incident Report as soon as possible. Grade Tech Services will investigate the incident with the supervisor and also review this program to see if any procedures need to be changed.

VI. Safety Programs:

Grade Tech Services has specific safety programs for operations that are frequently encountered. Supervisors are required to read these programs before being allowed to lead a team. They must also review these programs when starting a new project that involves the use of the relative programs. The specific safety programs are as follows:

- **Excavation Safety Program**
- **Working in Hot Substations**

VI. Hazard Communication:

Hazardous Chemical List:

- A list of the hazardous materials and chemicals, which are used in the course of the company's business activities, will be maintained and updated by Grade Tech Services. This list is to include all substances which require a Material Safety Data Sheet (MSDS).
- One copy of this list is to be kept in the front of each MSDS book and one copy is to be kept on file in the office. For each chemical used in the workplace, an MSDS sheet must be available on that jobsite.

Material Safety Data Sheets (MSDS):

- All Material Safety Data Sheets must be kept in an organized fashion and must be placed in an identified and accessible location for all employees to view at will. The MSDS book will be kept in each company truck as well as in the jobsite trailer. A duplicate set of MSDS information must be maintained by the supervisor.
- MSDS books and the Hazardous Chemical List must be maintained and kept up to date. As obsolete MSDS's are replaced by updated copies, they must be retained in a separate file of obsolete MSDS's. Do not throw them away. It is encouraged, particularly for routinely used chemicals, that the correct MSDS be verified since the chemicals may have been reformulated, improved, or MSDS may have been updated.
- If a hazardous chemical or substance is received without a proper MSDS, the receiving person must immediately notify Grade Tech Services. The manufacturer or distributor of the product must be contacted immediately and asked to email the MSDS and mail a copy as a follow up. If, for some reason, the manufacturer or distributor is unable to produce a MSDS upon request, Grade Tech Services should be notified immediately. Hazardous materials or substances received without an MSDS are to be returned to the sender.

Labeling:

- Each container of a hazardous chemical that is used in or around the work area must be properly labeled with the identity of the hazardous material, the appropriate hazard warnings, and the name and address of the manufacturer. Appropriate labels must be on all containers, regardless of size. Containers must be approved and recommended for storage and/or dispensing of the particular hazardous chemicals contained in them.
- Worn and torn labels must be replaced. It is the responsibility of employees to report inappropriate labels to their supervisor. It is the responsibility of the Hazard Communication Officer to insure that appropriate labels are in place and that replacement labels are available.
- Portable containers of Hazardous Materials do not require labeling if they are transferred from labeled containers and are intended for immediate use by the employee who performs the transfer. It is encouraged that portable containers not immediately used will be emptied (and cleaned when necessary) within 24 hours.

Storage: All storage areas for hazardous substances are to be secured, properly ventilated, and identified by signs.

Non-Routine Tasks:

- Before any non-routine task is performed, employees shall be advised and/or they must contact the supervisor for special precautions to follow and the supervisor shall inform any other personnel who could be exposed. (No non-routine tasks are known to exist at the time of preparation of this program.)
- If a non-routine task is necessary, the supervisor will provide the following information about the activity as it relates to the specific chemicals expected to be encountered:
 - specific chemical name(s) and hazard(s);
 - personal protective equipment required and safety measures to be taken;
 - measures that have been taken to lessen the hazards including ventilation, respirators, presence of other employees(s); and
 - emergency procedures.

Other Personnel Exposures (Contractors): The supervisor will provide other personnel or outside contractors with the following information as follows:

- hazardous chemicals to which they may be exposed to while in the workplace;
- measures to minimize the possibility of exposure;
- location of the MSDS and labeling requirements for all hazardous chemicals; and
- procedures to follow if they are exposed.
- The supervisor will contact each contractor before work is started to gather and disseminate any information concerning chemical hazards the contractor is bringing into the workplace, and visa versa.

VII. Program Compliance:

Any direct or intentional violation or non-compliance with this program may result in the termination of the person or persons involved, in accordance with company policy.



"Take 5" For Safety

(A Job Brief or "Take 5" must be conducted in the work area at least twice daily; before work begins each morning, immediately following lunch and again whenever the scope of work changes throughout the day.)

Company/Contractor Name: _____ Date: _____

Project Name/Number or Location: _____

"Take 5" Conducted By: _____ Time: _____ AM PM

1. Describe the task(s) to be conducted: _____ Time: _____ AM PM

2. Address the following "Key Questions":

Critical Steps?	Hazards/Error Likely Situations?	Defenses/Controls?

3. Name additional equipment, precautions, PPE and controls needed/implemented to perform job safely and protect workers:

3a. On Call Number	3b. Method Of Procedure Permit

4. Workers new to the jobsite/crew received a site walkdown with supervisor to review hazards and/or site conditions? Yes No

5. Was three-way communication, repeat back, used during review of hazards and controls? Yes No

6. Crew was engaged/interactive in Take 5 and are confident/clear in job assignments, potential hazards and controls. Yes No

7. Have ALL crew members reviewed the Safe Work Plan, JHA's and/or Safety Procedures developed for the tasks? Yes No

8. JHA's or Safety Procedures must be developed for all tasks. List the specific JHA's/Safety Procedures reviewed with the crew.
 (*Include "Rules to Dig By" if performing excavation work of any kind*):

9. Crew Members: (With my signature I acknowledge that I have reviewed the JHA(s)/Safety procedures for the tasks and understand the hazards and controls needed to perform my work safely.)

Print Name	Signature	Print Name	Signature

10. Additional Notes/Comments:

11. Supervisor Review for Quality: _____ Date: _____ Time: _____

Signature: _____

OSHA's Form 301

Injuries and Illnesses Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____
Title _____
Phone _____ Date _____

Information about the employee

- 1) Full Name _____
- 2) Street _____
City _____ State _____ Zip _____
- 3) Date of birth _____
- 4) Date hired _____
- 5) Male
 Female

Information about the physician or other health care professional

- 6) Name of physician or other health care professional

- 7) If treatment was given away from the worksite, where was it given?
Facility _____
Street _____
City _____ State _____ Zip _____
- 8) Was employee treated in an emergency room?
 Yes
 No
- 9) Was employee hospitalized overnight as an in-patient?
 Yes
 No

Information about the case

- 10) Case number from the Log _____ *(Transfer the case number from the Log after you record the case.)*
- 11) Date of injury or illness _____
- 12) Time employee began work _____ AM/PM
- 13) Time of event _____ AM/PM Check if time cannot be determined
- 14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."
- 15) **What happened?** Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."
- 16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."
- 17) **What object or substance directly harmed the employee?** Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.
- 18) **If the employee died, when did death occur?** Date of death _____



Excavation Safety Program

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I. Excavation Requirements:

Utilities and Pre-Work Site Inspection: Prior to excavation, the site shall be thoroughly inspected by the supervisor to determine if special safety measures must be taken.

Surface Encumbrances: All equipment, materials, supplies, permanent installations (i.e., buildings or roadways), trees, brush, boulders, and other objects at the surface that could present a hazard to employees working in the excavation shall be removed or supported as necessary to protect employees.

Underground Installations:

- The location of sewer, telephone, fuel, electric, water, or any other underground installations or wires that may be encountered during excavation work shall be determined and marked prior to opening an excavation. Arrangements shall be made as necessary by the supervisor with the appropriate utility entity for the protection, removal, shutdown, or relocation of underground installations.
- If it is not possible to establish the exact location of these installations, the work may proceed with caution if detection equipment or other safe and acceptable means are used to locate the utility.
- Excavation shall be done in a manner that does not endanger the underground installations or the employees engaged in the work. Utilities left in place shall be protected by barricades, shoring, suspension, or other means as necessary to protect employees.

Protection of the Public: Barricades, walkways, lighting, and posting shall be provided as necessary for the protection of the public prior to the start of excavation operations.

- Guardrails, fences, or barricades shall be provided on excavations adjacent to walkways, driveways, and other pedestrian or vehicle thoroughfares. Warning lights or other illumination shall be maintained as necessary for the safety of the public and employees from sunset to sunrise.
- Wells, holes, pits, shafts, and all similar hazardous excavations shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type shall be backfilled as soon as possible.
- Walkways or bridges protected by standard guardrails shall be provided where employees and the general public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toe board shall be used to prevent the hazard of falling objects. Information on the requirements for guardrails and toe boards may be obtained by contacting the supervisor.

Protection of Employees: Stairs, ladders, or ramps shall be provided at excavation sites where employees are required to enter trench excavations over four (4) feet deep. The maximum

distance of lateral travel (along the length of the trench) necessary to reach the means of egress shall not exceed 25 feet.

- **Structural Ramps:** Structural ramps 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 person qualified in structural design, and shall be constructed in accordance with the design. Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent movement or displacement. Structural members used for ramps and runways shall be of uniform thickness. 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. Structural ramps used in place of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.
- **Ladders:** When portable ladders are used, the ladder side rails shall extend a minimum of three (3) feet above the upper surface of the excavation. Ladders shall have nonconductive side rails if work will be performed near exposed energized equipment or systems. Two or more ladders, or a double-cleated ladder, will be provided where 25 or more employees will be conducting work in an excavation where ladders serve as the primary means of egress, or where ladders serve two-way traffic. Ladders will be inspected prior to use for signs of damage or defects. Damaged ladders will be removed from service and marked with "Do Not Use" until repaired. Ladders shall be used only on stable and level surfaces unless secured. Ladders placed in any location where they can be displaced by workplace activities or traffic shall be secured, or barricades shall be used to keep these activities away from the ladders. Non self-supporting ladders shall be positioned so that the foot of the ladder is one-quarter of the working length away from the support. Employees are not permitted to carry any object or load while on a ladder that could cause them to lose their balance and fall.

Exposure to Vehicular Traffic: Employees exposed to 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. Warning vests worn by flagmen shall be red or orange, and shall be reflectorized material if worn during night work. Emergency lighting, such as spotlights or portable lights, shall be provided as needed to perform work safely.

Exposure to Falling Loads: No employee is permitted underneath loads being handled by lifting or digging equipment. Employees are 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 provide adequate protection for the operator during loading and unloading operations.

Warning System for Mobile Equipment: A warning system shall be used when mobile equipment is operated adjacent to the edge of an excavation if the operator does not have a clear and direct view of the edge of the excavation. The warning system shall consist of

barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

Hazardous Atmospheres: The supervisor will test the atmosphere in excavations over four (4) feet deep if a hazardous atmosphere exists or could reasonably be expected to exist. A hazardous atmosphere could be expected, for example, in excavations in landfill areas, areas where hazardous substances are stored nearby, or near areas containing gas pipelines.

- 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 forced ventilation of the workspace.
- Forced ventilation or other effective means shall be used to prevent employee exposure to an atmosphere containing a flammable gas in excess of ten (10) percent of the lower flammability limit of the gas.
- When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, continuous air monitoring will be performed by the supervisor. The device used for atmospheric monitoring shall be equipped with an audible and visual alarm.
- Atmospheric testing will be performed using a properly calibrated direct reading gas monitor. Direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres.
- Each atmospheric testing instrument shall be calibrated by the supervisor on a schedule and in the manner recommended by the manufacturer.
- In addition: Any atmospheric testing instrument that has not been used within 30 days shall be recalibrated prior to use. Each atmospheric testing instrument shall be calibrated at least every six (6) months. Each atmospheric testing instrument will be field checked immediately prior to use to ensure that it is operating properly.

Personal Protective Equipment:

- All employees working in trenches or excavations shall wear approved hardhats and steel-toed shoes or boots.
- Employees exposed to flying fragments, dust or other materials produced by drilling, sawing, sanding, grinding, and similar operations shall wear approved safety glasses with side shields.
- Employees performing welding, cutting, or brazing operations, or are exposed to the hazards produced by these tasks, shall wear approved spectacles or a welding faceshield or helmet, as determined by the supervisor.
- 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.
- Employees shall wear, as determined by the supervisor, approved gloves or other suitable hand protection.

- Employees using or working in the immediate vicinity of hammer drills, masonry saws, jackhammers, or similar high-noise producing equipment shall wear suitable hearing protection, as determined by the supervisor.
- Each employee working at the edge of an excavation six (6) feet or more deep shall be protected from falling. Fall protection shall include guardrail systems, fences, barricades, covers, or a tie-back system meeting OSHA requirements, as determined by the supervisor.
- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, and a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may develop during work in an excavation. This equipment shall be attended when in use. Only personnel who have received approved training and have appropriate equipment shall attempt retrieval that would require entry into a hazardous atmosphere. If entry into a known hazardous atmosphere must be performed, then the supervisor must be given advance notice so that the hazards can be evaluated and rescue personnel placed on standby if necessary.

Walkways and Guardrails: Walkways shall be provided where employees or equipment are permitted to cross over excavations. Guardrails shall be provided where walkways, accessible only to on-site project personnel, are six (6) feet or more above lower levels.

Protection from Water Accumulation Hazards:

- Employees are not permitted to work in excavations that contain or are accumulating water unless precautions have been taken to protect them from the hazards posed by water accumulation. Precautions may include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of safety harnesses and lifelines.
- If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operation shall be monitored by a person trained in the use of that equipment.
- If excavation work interrupts the natural drainage of surface water (such as streams), then diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation. Precautions shall also be taken to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains shall be re-inspected by the supervisor after each rain incident to determine if additional precautions, such as special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of safety harnesses and lifelines, should be used.
- The supervisor shall inform affected workers of the precautions or procedures that are to be followed if water accumulates or is accumulating in an excavation.

Stability of Adjacent Structures: The supervisor will determine if the excavation work could affect the stability of adjoining buildings, walls, sidewalks, or other structures.

- Support systems (such as shoring, bracing, or underpinning) shall be used to assure the stability of structures and the protection of employees where excavation operations could affect the stability of adjoining buildings, walls, or other structures.
 - 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 a support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; the excavation is in stable rock; 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 a registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
 - Sidewalks, pavements, and appurtenant structures shall not be undermined unless a support system or other method of protection is provided to protect employees from the possible collapse of such structures.
 - Where review or approval of a support system by a registered professional engineer is required, the supervisor shall secure this review and approval in writing before the work begins.

Protection from Falling Objects and Loose Rocks or Soil:

- 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, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or benching sufficient to contain falling material.
- Excavation personnel shall not be permitted to work above one another where the danger of falling rock or earth exists.
- Employees shall be protected from excavated materials, equipment, or other materials that could pose a hazard by falling or rolling into excavations.
- Protection shall be provided by keeping such materials or equipment at least two (2) feet from the edge of excavations, by use of restraining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.
- Materials and equipment may, as determined by the supervisor, need to be stored further than two (2) feet from the edge of the excavation if a hazardous loading condition is created on the face of the excavation.
- Materials piled, grouped, or stacked near the edge of an excavation must be stable and self-supporting.

Inspection by the supervisor:

- The supervisor shall conduct daily inspections of excavations, adjacent areas, and protective systems for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the supervisor 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 the trench will be or is occupied by employees.

- Where the supervisor finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmosphere, or other hazardous conditions, exposed employees shall be removed from the hazardous area until precautions have been taken to assure their safety.
- The supervisor shall maintain a written log of all inspections conducted. This log shall include the date, work site location, results of the inspection, and a summary of any action taken to correct existing hazards.

II. Protective System Requirements:

Protection of Employees:

- Employees in an excavation shall be protected from cave-ins by using either an adequate sloping and benching system or an adequate support or protective system. The only exceptions are excavations made entirely in stable rock; or excavations less than five (5) feet in depth where examination of the ground by the supervisor provides no indication of a potential cave-in.
- Protective systems shall be capable of resisting all loads that could reasonably be expected to be applied to the system.

Design of Sloping and Benching Systems: The slope and configuration of sloping and benching systems shall be selected and constructed by the supervisor in accordance with the following options:

- **Allowable configuration and slopes:**
 - Excavations shall be sloped at an angle no steeper than one and one-half (1 ½) horizontal to one (1) vertical (34 degrees measured from the horizontal), unless one of the options listed below is used.
 - Slopes shall be properly excavated depending on soil type as shown in 29 CFR 1926, Subpart P, Appendix B.
- **Determination of slopes and configurations using 29 CFR 1926, Subpart P, Appendices A and B.** The maximum allowable slopes and allowable configurations for sloping and benching systems shall meet the requirements set forth in these appendices.
- **Designs using other tabulated data:** The design of sloping or benching systems may be selected from, and shall be constructed in accordance with, other tabulated data, such as tables and charts. The tabulated data used must be in written form and include the following:
 - Identification of the factors that affect the selection of a sloping or benching system.
 - Identification of the limits of the use of the data, including the maximum height and angle of the slopes determined to be safe.

- Other information needed by the user to make correct selection of a protective system.
- At least one copy of the tabulated data that 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, and shall be maintained by the supervisor.
- **Design by a registered professional engineer:**
 - Sloping or benching systems designed in a manner other than those described in the preceding three options shall be approved by a registered professional engineer.
 - Designs shall be in written form and shall include at least the following information: the maximum height and angle of the slopes that were determined to be safe for a particular project; and the identity of the registered professional engineers who approved the design.
 - At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time, the design may be stored off the jobsite, and shall be maintained by the supervisor.

Design of Support, Shield, and Other Protective Systems: The design of support systems, shield systems, and other protective systems shall be selected and constructed by the supervisor in accordance with the following requirements:

- **Designs using 29 CFR 1926, Subpart P, Appendices A, C and D**
 - Timber shoring in trenches shall be designed in accordance with the requirements of the OSHA guidelines.
 - Aluminum hydraulic shoring shall be designed in accordance with the manufacturer's tabulated data or the requirements of the OSHA guidelines.
- **Designs using manufacturer's tabulated data**
 - Support systems, shield systems, and other protective systems designed from manufacturer's tabulated data shall be constructed and used in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.
 - Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall be allowed only after the manufacturer issues specific written approval.
 - Manufacturer's specifications, recommendations, and limitations, as well as the manufacturer's written approval to deviate from the specifications, recommendations, and limitations, shall be kept in written form at the jobsite during construction of the protective system(s). After that time, the information may be stored off the jobsite, and shall be maintained by the supervisor.
- **Designs using other tabulated data:** Designs of support systems, shield systems, and other protective systems shall be selected from and constructed in accordance with tabulated data, such as tables and charts.
 - The tabulated data shall be in written form and shall include all of the following: identification of the factors that affect the selection of a protective system

drawn from such data; identification of the limits of the use of such data; and information needed by the user to make a correct selection of a protective system from the data.

- At least one written 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, and shall be maintained by the supervisor.
- **Design by a registered professional engineer:** Support systems, shield systems, and other protective systems designed in a manner other than the preceding three options shall be approved by a registered professional engineer.
 - Designs shall be in written form and shall include a plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and the identity of the registered professional engineer who approved the design.
 - 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, and shall be maintained by the supervisor.

Materials and Equipment:

- Materials and equipment used for protective systems shall be free from damage or defects that might affect their proper function.
- Manufactured materials and equipment used for protective systems shall be used and maintained in accordance with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.
- When materials or equipment used for protective systems are damaged, the supervisor shall ensure that these systems are examined by a competent person to evaluate suitability for continued use. If the competent person cannot assure that 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. The material or equipment shall then be evaluated and approved by a registered professional engineer before being returned to service.

Installation and Removal of Supports:

- Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other potential hazards.
- 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 systems.
- Individual members of the support systems shall not be subjected to loads exceeding those that they were designed to support.
- Before temporary removal of individual support members begins, additional precautions shall be taken as directed by the supervisor to ensure the safety of

employees (i.e., the installation of other structural members to carry the loads imposed on the support system).

- Removal of support systems shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly. If there is any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation, the work shall be halted until it can be examined by the supervisor.
- Backfilling shall progress in conjunction with the removal of support systems from excavations.
- Excavation of material to a level no greater than two (2) feet below the bottom of the members of a support system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench. There shall be no indications of a possible loss of soil from behind or below the bottom of the support system while the trench is open.
- Installation of a support system shall be closely coordinated with the excavation of trenches.

Sloping and Benching Systems: Employees are not permitted to work above other employees in the faces of sloped or benched systems, except when employees at lower levels are protected from the hazards of falling, rolling, or sliding material or equipment.

Shield Systems:

- Shield systems shall not be subjected to loads that are greater than those they are designed to withstand.
- Shields shall be installed in a manner that will restrict lateral or other hazardous movement of the shield and could occur during cave-in or unexpected soil movement.
- Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- Employees are not permitted in trenches when shields are being installed, removed, or moved vertically.
- Excavation of material to a level no greater than two (2) feet below the bottom of the shield system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench.
- There shall be no indications of a possible loss of soil from behind or below the bottom of the shield system while the trench is open.



Working in Hot Substations

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I. Introduction:

By design, substations have exposed energized buss work, which is often found in low proximity to the ground. Only qualified workers are allowed to perform and direct work; nonqualified workers must be under the supervision of a qualified worker. Extreme care should be taken when moving equipment or material within close proximity of all buss work.

II. General Access and Use of Substations:

- Prior to entering a substation, contact the designated authority on a daily basis.
- A preliminary visit/walk-down may be required at the substation. At that time, parking sites, material drop sites, hazards and other issues can be addressed.
- Supervisors must know your contact person representing the utility or municipality.
- The contact person's phone number, pager number and other information should be on file with Grade Tech Services and with the supervisor.
- The contact person is responsible for meeting the expectations for substation site use.

III. Safety and Security:

- All gates must be locked when working at and leaving the site.
- Only authorized personnel are allowed on the site.
- Obey all policies pertaining to alcohol, drugs and firearms while on substation property.
- Report any suspicious activity observed, such as a security or safety problem.
- Adhere to minimum clearances from energized equipment. 10 feet minimum, and more for equipment over 50,000 volts.
- **Fire Resistant shirts must be worn at all times.** All personnel are also required to wear a hard hat, a high visibility vest, safety goggles and steel-toed boots.
- Spotters are required when using machinery around any steel structures, electrical equipment, overhead wires, or concrete footings. At least one spotter is required, two or more are preferred. Always spot trucks that are backing up.
- You are never allowed to touch or work on electrical equipment.
- You are never allowed to cut any electrical cables. If you encounter cables while digging contact the electrically qualified person on site.
- If any steel structures, electrical equipment, overhead wires, or concrete footings are hit with machinery, even in the smallest way, you must notify the electrically qualified person on site.

IV. Communication:

- Report your presence in the station to the designated authority each day. Do not assume that the designated authority is aware that you are working in the station that day. Have a line of communication established before the job starts.
- If required, enter appropriate information into the logbook upon arrival at the station each day. Typical information includes the station name, date and time, names of your crew members, the type of work being done, clearance (LOTO) numbers and any other information thought to be necessary.
- Hold a "Take 5" meeting at the start of each workday, and then again any time the scope of work changes, when new members join the crew, and when something changes that could impact the job and safety. Document the information from this meeting on the "Take 5" document.
- When working near any structures within a substation, a method of procedure report must be filed by the supervisor and approved by Grade Tech Services before any work can begin.

V. Storage and Job Site Materials:

- Any materials stored in the substation site must be kept neat and only in safe areas.
- Pickup and delivery must be in a safe manner and away from energized equipment.
- No hazardous material can be stored in a substation unless prior approval is given by the designated authority and proper documentation is provided or in place.
- All materials must be removed prior to leaving the substation when the job is completed.

VI. Damage:

- Any damage to any steel structures, electrical equipment, overhead wires, or concrete footings, even of the smallest nature, must be notified to the electrically qualified person on site. An incident report must be filed, and will be reviewed by Grade Tech Services.
- Particular attention must be paid to gates, fencing and lighting structures.

VII. Vehicles:

- When driving vehicles or equipment in substations, do not drive over cable covers covering underground cableways. These covers are not designed to carry heavy loads. Vehicles and equipment should only pass over trough covers at designated crossing areas where reinforcement or steel plates are placed.
- Trucks used in a substation shall be grounded per utility/municipality requirements.
- All vehicles in transit shall maintain minimum approach distances from equipment. An escort may be designated to assist the vehicle operator in guiding the vehicle and assuring proper minimum approach distances are maintained.
- While in transit, cranes and vehicles with booms shall cross under energized lines or busses with no load on the crane and with the boom in the cradle or lowered position.
- Parking of trucks, equipment, and personal vehicles should be in authorized and safe areas only.
- All driveways, walkways and access-ways must remain accessible and open.

VIII. Non-Qualified Personnel:

- Twenty feet is as close as nonqualified personnel should come to energized conductors and equipment.
- If nonqualified personnel need to get closer than 20 feet to energized conductors or equipment, they must contact the electrically qualified person on the job site.
- A qualified representative or watchman must be provided and remain on the job until all work inside the 20-foot area is complete.

- Under no circumstance shall nonqualified personnel operate equipment closer than the minimum approach distance to energized aerial facilities regardless of the qualifications of others on the job, or the protection placed on the energized equipment. A qualified electrical worker will tell you the minimum approach distance.
- Following these rules may necessitate the relocation or de-energizing of certain aerial facilities in order for nonqualified employees to use their equipment.

IX. Leaving Substations:

- All trash and materials must be removed at the end of the job. Food trash should be removed daily to prevent rodent infestations.
- The designated authority must be notified by the contractor contact person when your group leaves the substation site.
- Sites should be left in the same condition found upon arrival.

By following these guidelines, you will establish good communication between workers and the substation owner/designated authority, which ensures that the scope of work is clearly communicated. Finally, always leave the substation in a condition that meets the owner's expectations, and make certain it is secured to prevent harm to the public.