Safety Manager:
Joaquin Blas

Pacific Northwest Towers
Safety Program Binder

REVISION HISTORY TABLE

Change	Version	Date	Modified By	Authorized By
Initial Issue of 24 Programs	1.0	06/10/2021	Pacific Northwest Towers	Joaquin Blas
	1.1			
	1.2			
	1.3			
	1.4			

Aerial and Scissor Lifts

PURPOSE

The purpose of this document is to outline safety policy and procedures for the use of aerial and scissor lift devices for **Pacific Northwest Towers**; hereafter referred to as "The Company."

The hazards of potential falls at heights of 6 feet and above will be addressed in this document. This instruction describes a systematic approach that must be used to protect and prevent people from falling. This instruction also lists some of the most common fall hazards and provides recommendations and guidelines for selecting fall arrest systems.

OSHA 1926.453 1926.500-503, 1926.502(j)

RESPONSIBILITIES

The Company/Management

- Perform annual reviews of this safety policy and any corresponding training programs/records
- Ensure all worksites are protected from aerial/scissor lift injury by providing the necessary PPE
- Enforce the contents of this policy and procedure
- Ensure all aerial lift devices are properly operated by competent persons
- Ensure all aerial lift devices used are designed and constructed in conformance with the requirements set forth by the American National Standards for Vehicle Mounted Elevating and Rotating Work Platforms ANSI A92.2 - 1969
- Active management team to ensure that all aerial lift devices are properly operated by trained personnel

POLICY

Inspections

All aerial lift equipment shall be inspected at the beginning of each work shift to verify that all components of the equipment are in safe operating condition. Workers shall not operate any aerial lift equipment if any component of the pre-shift/job checklist are defective. Any equipment found defective or in need of repair shall be marked as defective and in need of repair, until repaired by qualified personnel prior to operating the defective piece of equipment. In addition to this routine inspection, all lift controls, brakes, and operating systems shall be tested each day prior to use, in order to verify that they are in safe working condition.

Worksite inspections shall be performed at the start of each shift or job to verify the area is safe for the operation of aerial lifts and other devices.

The worksite inspection shall cover the following:

- Drop-offs, holes or unstable surfaces such as but not limited to lose dirt, slopes, ditches, bumps, or oil and chemicals that may cause a slip.
- Inadequate ceiling heights or other low hanging obstructions such as but not limited to trees or power lines.
- High winds and or severe weather conditions such as but not limited to ice.
- The presence of other workers and personnel in the operation.

All inspections that take place shall be documented.

FALL PROTECTION/CONTROLLED ACCESS ZONES

If Fall Protection Plans are utilized, the following requirements need to be met:

- When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.
  - When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting precast concrete members.
  - When erecting precast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.
  - The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
  - The control line shall be connected on each side to a guardrail system or wall.
- When used to control access to areas where overhand bricklaying and related work are taking place:
  - The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.
  - The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.

To prevent falls from aerial lift devices, the following rules shall be followed at all times, **except when the device is a Scissor Lift.**

- Use a body harness or a restraining belt with a lanyard attached to the boom or bucket.
- An approved fall restraint system shall be worn when working from an aerial lift device. The fall restraint system must be attached to the boom or to the basket.
- Never tie-off, or "belt-off" to any adjacent structure or pole while in the bucket of the device.

- Never use ladders, planks, or other material/device as a brace or standing platform as a working position.
- Never climb or lean over guardrails or handrails, and always stand firmly on the floor of the basket or platform.
- Always stand firmly on the floor of the bucket or lift platform.
- Ensure that access gates or openings are closed at all times.
- The load capacity may never, under any circumstance, be exceeded. The combined weight of the workers, tools and materials must be taken into account when calculating the load.
- Boom and basket load limits specified by the manufacturer shall not be exceeded.
- Be aware of overhead clearance and overhead objects at all times. The minimum clearance between electrical lines and any part of the equipment shall be 10 (ten) feet for all power lines rated 50 kV or below.
- Never use an aerial lift device as a crane or use the aerial lift device to transport objects larger than the platform.
- Always communicate with the worker(s) in the bucket/platform before engaging any of the lower-level controls. Always obtain permission from persons in the bucket before moving the lift, except in the case of an emergency.
- All aerial lift devices operated shall have a working back-up alarm audible above the surrounding noise level. If the specified device does is not equipped with a back-up alarm, the device may only be backed or in the reverse position when accompanied by a spotter or observer to ensure safe backing.
- Aerial lift devices may only be field modified for uses intended by the manufacturer. All manufacturer recommendations for device modification must be in writing from the manufacturer or an equivalent entity. Said written consent must also be kept on file at least one of The Company's locations.
- Never operate the device in winds higher than recommended by the manufacturer.
- Never override hydraulic, mechanical or electrical safety devices.

AERIAL LIFT TRAINING

Any persons operating an aerial lift device must be trained as a competent person prior to operation and all training must meet or exceed OSHA requirements as set forth in the Code of Federal Regulations (C.F.R.)

Training may be obtained from the rental company or other certified training facility.
Retraining shall occur annually or when an employee shows a lack of understanding of aerial lift safe operating procedures.

AERIAL LIFT EQUIPMENT

Aerial lift devices shall conform to ANSI standards applicable to the type of equipment being used – bucket truck, under-bridge inspection vehicle, portable and or self-propelled personnel lift. Aerial lift devices shall only be used for the purpose intended by the manufacturer. All manufacturer maintenance recommendations, warning regarding operation, capacity and safety precautions shall be strictly followed at all times. Permanent labeling must be conspicuously posted to indicate lifting capacity and travel height.

Only devices approved for lifting personnel shall be used as aerial lifts. Loaders, forklifts and other material lift devices shall not be used to transport employees to elevated locations nor as work platforms. Forklifts and cranes may only be used as a last resort, and then only with approved personnel baskets.

The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled, and outriggers are in stowed position.

An aerial lift truck may not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation.

Before the truck is moved for highway travel, aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means.

Modifications shall not be made to any aerial lift device without the express written authorization from the manufacturer. Buckets and bucket liners shall not be drilled, cut, welded on etc.

Dual Controls

Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

Braking/Choking

The brakes shall be set and when outriggers are used, they shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed.

Bursting Safety Factor
The provisions of the American National Standards Institute standard ANSI A92.2-1969, section 4.9 Bursting Safety Factor shall apply to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least 2 to 1.

Scissor Lift

POLICY

Only trained workers are allowed to use scissor lifts.

Scissor lifts provide a safe and reliable platform for workers to perform job tasks when used according to the manufacturer's instructions. When not used properly, scissor lifts can present a serious hazard to workers. Employers are responsible for keeping workers safe. This Hazard Alert highlights specific hazards present in workplaces where scissor lifts are used, and controls employers must implement to prevent injuries or fatalities.

Introduction
Scissor lifts are work platforms used to safely move workers vertically and to different locations in a variety of industries including construction, retail, entertainment and manufacturing.

Scissor lifts are different from aerial lifts because the lifting mechanism moves the work platform straight up and down using crossed beams functioning in a scissor-like fashion.

Although scissor lifts present hazards similar to scaffolding when extended and stationary, using scissor lifts safely depends on considering equipment capabilities, limitations and safe practices.

Over a one-year period, OSHA investigated ten preventable fatalities and more than 20 preventable injuries resulting from a variety of incidents involving scissor lifts. OSHA's investigations found that most injuries and fatalities involving scissor lifts were the result of employers not addressing:

- Fall Protection
- Stabilization
- Positioning

HOW TO SAFELY USE SCISSOR LIFTS

Safe scissor lift use includes:

- Properly maintaining the equipment
- Following the manufacturer's instructions

- Providing workers training and needed PPE
- Implementing safe work practices

The worksite safety coordinator shall assess each worksite to identify all possible hazards to select the appropriate equipment for the task.

The worksite safety coordinator shall evaluate and implement effective controls that address fall protection, stabilization and positioning, prior to initial assignment.

FALL PROTECTION FOR SCISSOR LIFTS

Scissor lifts must have guardrails installed to prevent workers from falling 29 CFR 1926.451(g) or 29 CFR 1910.29(a)(3)(vii).

The Company will train all workers to:

- Check to see that a guardrail system is in place before working on the scissor lift.
- Only stand on the work platform; never stand on the guardrails.
- Keep work within easy reach to avoid leaning away from the scissor lift.

STABILIZATION FOR SCISSOR LIFTS

The Company will ensure that scissor lifts are stable and will not tip over or collapse.

Stable conditions for scissor lift use include:

- Follow the manufacturer's instructions for safe movement – this usually rules out moving the lift in an elevated position.
- Isolate the scissor lift or implement traffic control measures to ensure that other equipment cannot contact the scissor lift.
- Select work locations with firm, level surfaces away from hazards that can cause instability (e.g., drop-offs, holes, slopes, bumps, ground obstructions, or debris).
- Use the scissor lift outside only when weather conditions are good. Scissor lifts rated for outdoor use are generally limited to wind speeds below 28 miles per hour.
- Ensure that safety systems designated to stop collapsing are maintained and not bypassed.
- Never allow the weight on the work platform to exceed the manufacturer's load rating.
- Never allow equipment other than the scissor mechanism to be used to raise the work platform (e.g., using a forklift to lift the work platform).
- Keep the lift from being struck by other moving equipment on the worksite.

POSITIONING FOR SCISSOR LIFTS

Positioning the scissor lift to avoid crushing or electrocution hazards is important for safe use.

Crushing hazards are present in workplaces using scissor lifts and may expose workers nearby, even those not working on the scissor lift.

Scissor lift presents crushing hazards similar to vehicles and other mobile equipment at worksites.

The Company will train workers to be watchful when:

- A moving scissor lift is near a fixed object.
- A moving vehicle and the scissor lift are operating closely.
- The scissor lift passes under a fixed object, such as a door frame or support beam.

SCISSOR LIFT USE NEAR ENERGIZED POWER LINES

The Company will ensure scissor lifts are not positioned within close proximity of energized power lines, because electrocution can occur even if neither the scissor lift nor the worker touches the power line.

Position the scissor lift to avoid electrocution, arc flash, and thermal burns.

The Company will use the following safe work practices to ensure that scissor lifts are safely positioned:

- Implement traffic control measures around the scissor lift to prevent other workers or vehicles from getting too close.
- Use ground guides when operating or moving the scissor lift around the workplace.
- Operators must maintain a minimum clearance distance of at least ten feet between overhead powerlines that are 50kV or less and any part of the equipment or load unless the lift is insulated for the voltage involved, and the work is performed by a qualified person, then the clearance distance between the uninsulated portion of the aerial lift
- If the job task requires work near an electrical source, ensure that the worker is qualified and has received the required electrical training. (29 CFR 1910.269, 29 CFR 1910.333, and 29 CFR 1926 Subpart V).

SCISSOR LIFT EQUIPMENT MAINTENANCE

The Company will regularly maintain scissor lifts to ensure that they are safe to use (e.g., Prevent the lifting mechanism from collapsing).

The Company will regularly:

- Test and inspect controls and components before each use.
- Ensure that guardrail systems are in good working condition.
- Verify that brakes once set will hold the scissor lift in position.

TRAINING FOR SCISSOR LIFTS

The Company will provide workers training on hazards including how to work safely with or near scissor lifts. (Ref: 29 CFR 1926.454) Training will, at a minimum, include:

- Manufacturer's instructions for operating the scissor lift vertically and while in transit.
- How to handle materials on the scissor lift, including weight limits.
- Other worksite hazards workers may encounter when working on a scissor lift (e.g., contact with electrical wires.

IMPORTANT INFORMATION REGARDING SCISSOR LIFT COMPLIANCE

The Company will comply with the following OSHA standards (29 CFR) to protect workers from hazards associated with scissor lifts:

General Industry

- 29 CFR 1910.23 – Guarding Floor and Wall Openings and Holes
- 29 CFR 1910.28 – Safety Requirements for Scaffolding
- 29 CFR 1910.29 – Manually Propelled Mobile Ladder Stands and Scaffolds (Towers)
- 29 CFR 1910.333 – Selection and Use of Work Practices

Shipyards

- 29 CFR 1915.71 – Scaffolds or Staging

Construction

- 29 CFR 1926.21 – Safety Training and Education
- 29 CFR 1926.451 – General Requirements
- 29 CFR 1926.452 – Additional Requirements to Specific Types of Scaffolds
- 29 CFR 1926.454 – Training Requirements

Note: Many scissor lifts are covered under OSHA's Scaffolding Standard.

The American National Standards Institute (ANSI) has standards for manufacturing, owning and operating scissor lifts. They can be found in ANSI A92.3-2006 (Manually Propelled Elevating Aerial Platforms) and A92.6-2006 (Self-Propelled Elevating Work Platforms.)

DEFINITIONS

Aerial Lift - As defined by OSHA, as any vehicle-mounted device that may be used to elevate personnel, including:

- Extendable boom platforms;
- Aerial ladders;
- Articulating (jointed) boom platforms;
- Vertical towers, and any combination of the above.

Dual Controls – Articulating boom and extensible boom platforms primarily designed as personnel carriers shall have both platform (upper) and lower controls.

- Lower-level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of an emergency.

Aerial lifts may be made of metal, fiberglass or reinforced plastic, and they may be powered or manually operated. The device is classified by OSHA as an aerial lift device whether or not they can rotate around a primary vertical axis.

Construction Industry 1926.501(b)(1) - Unprotected sides and edges. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

American National Standards Institutes:
ANSI/SIA A92.2 – 1969
ANSI/SIA A92.3
ANSI/SIA A92.5
ANSI/SIA A92.6

OSHA
29 CFR 1910.67
29 CFR 1910.269(p)
29 CFR 1926.21
29 CFR 1926.453
29 CFR 1926.502

Bloodborne Pathogens

PURPOSE

The purpose of this document is to outline The Bloodborne Pathogens Exposure Control Plan for **Pacific Northwest Towers**; hereafter referred to as "The Company." OSHA requires that all employers that can "reasonably anticipate exposure" of employees to infectious material prepare and implement a written exposure control plan. This policy has been adopted by The Company to ensure a safe and healthful work environment for its personnel.

POLICY

Bloodborne pathogens are diseases caused by microorganisms that live in the bloodstream and are spread through blood and other body fluids. Bloodborne pathogens include the human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV). These can enter the bloodstream through cuts, abrasions, or small tears in mucous membranes.

Bloodborne pathogens can be transmitted through any bodily fluid, and employees must take care when they are near, or come into contact with possible contaminants, in order to prevent the spread of bloodborne infections.

RESPONSIBILITIES

The Company is committed to providing a safe and healthful work environment for all personnel. In pursuit of this objective, the following exposure control plan (ECP) is provided to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA 29 CFR 1910.1030, "Occupational Exposure to Bloodborne Pathogens." This plan is vital to assist our organization in implementing and ensuring compliance with the OSHA standard, thereby protecting our employees.

ECP Administration

Joaquin Blas shall be responsible for the implementation, maintenance, review and update of this ECP. The plan should be review at least once annually, but whenever necessary, to ensure the plan aligns with applicable regulatory standards. All personnel who have occupational exposure to blood and or other potentially infectious materials (OPIM) must comply with the procedures set forth in this policy.

Joaquin Blas shall provide and maintain, on behalf of The Company, all necessary personal protective equipment (PPE), engineering controls (e.g., sharps containers), labels, and red bags as required by the standard. **Joaquin Blas** will ensure that adequate supplies of the aforementioned equipment are available in the appropriate sizes at all times to ensure that all personnel have access if needed.

Joaquin Blas shall be responsible for ensuring that all medical actions required by the standard are performed and that appropriate employee health and OSHA records are maintained and current with applicable regulations at all times. **Joaquin Blas** will be responsible for training, documentation of training and for making the written ECP available to all personnel who perform work for The Company.

Joaquin Blas shall be responsible to identify employees who may reasonably be anticipated to come into contact with blood and other potentially infectious materials. The Company shall provide for post-exposure evaluation and follow-up should an employee be exposed to potentially infectious materials.

Employee Responsibilities

Every employee is expected to:

- Offer input on ECP as appropriate, including identification, evaluation, and selection of new control methods
- Follow all elements of the bloodborne pathogens policy and training
- Notify a supervisor if they encounter any problems or concerns related to this policy

PERSONNEL EXPOSURE DETERMINATION

Designated employees are trained to render first aid and basic life support; executing first aid or basic life support will expose employees to bloodborne pathogens and will require them to adhere to this ECP. Medical sharps or similar equipment is not provided to, or used by, personnel who may render first aid or basic life support. A list of all first aid and basic life support trained employees in this work group shall be maintained at each work site and within each first aid kit.

It is crucial to determine which jobs expose an employee to blood and other potentially infectious material, as well as the means by which that exposure might occur. Accordingly, the safety committee or management will determine which job classifications can reasonably expect occupational exposure to potentially infectious material. The following will be determined and documented:

- Job classifications where all employees have occupational exposure
- Job classifications where some employees have occupational exposure
- Tasks and procedures where occupational exposure occurs

Note: This exposure determination shall be made without regard to the use of personal protective equipment. 1910.1030(c)(2)(ii)

Methods of Compliance

Employees will take precautions to prevent contact with potentially infectious material. If an employee cannot easily determine the nature of a body fluid, he or she should treat it as infectious.

UNIVERSAL PRECAUTIONS

All employees will utilize universal precautions. Under circumstances in which differential of infectious bloodborne and noninfectious bloodborne body fluids is difficult or impossible, all body fluids will be considered potentially infectious.

Body Substance Isolation (BSI) may also be used as an alternative to Universal Precautions, provided facilities using the method adhere to all other provisions of the standard. BSI is a control method that defines all body fluids and substances as infectious. BSI incorporates not only the fluids and materials covered by the standard but expands coverage to include all body substances.

Regardless of which method is used, employees should be trained on the engineering controls, work practice controls, and personal protective equipment that should be used to prevent exposure to blood and OPIM. These are discussed in the following sections.

EXPOSURE CONTROL PLAN

Personnel covered by the bloodborne pathogens standards receive an explanation of this ECP during their initial training session as well as reviewed annual refresher training. Access to a copy of the ECP shall be provided to personnel in a reasonable time, place and manner; specifically, each employee will receive a copy of this plan as a part of The Company's entire HSE manual at time of hire as well as an updated/revised copy annually.

The Company's Exposure Control Plan covers the various types of bodily fluid that employees can reasonably be exposed to in the workplace, including but not limited to blood, mucus and saliva.

If an employee misplaces their copy of this ECP, a new copy will be issued to the employee within five working days. If the employee needs access to the ECP before The Company can provide them with a new copy, an office copy will be available at all times in the office.

Review and Update of Exposure Control Plan

The Company safety committee will review this ECP and update it at least annually, and whenever necessary, to reflect new or changed tasks and procedures that affect occupational exposure.

Reviews and updates will:

- Reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens.
- Document the annual consideration and implementation of effective medical, and commercially available, devices and services designed to eliminate or minimize occupational exposure.

ENGINEERING CONTROLS AND WORK PRACTICES

Engineering controls and work practice controls will be used to prevent or minimize exposure to bloodborne pathogens. This plan encourages work task changes to reduce exposure, as well as for isolating or removing materials that might pose a hazard. The ECP shall be examined regularly to maintain, and replace, engineering controls to ensure their effectiveness, such as:

Handwashing

- The Company will provide readily accessible handwashing facilities to every employee. If providing handwashing facilities is not feasible, the Company will provide antiseptic towelettes or an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels.
- For construction projects, the company must provide onsite general washing facilities (one per 20 employees), keep them in sanitary condition, and provide suitable cleaning agents/towels for the removal of hazardous and other substances.
- In addition to basic workplace hygiene requirements, employees will wash their hands as soon as possible after removing gloves or other PPE.
- Should an employee's skin or mucous membrane be exposed to potentially infectious materials, the employee will immediately wash their skin with soap and water or flush their mucous membranes with water.

Sharps

- Employees will handle and dispose of contaminated sharps in a way that prevents unnecessary exposure to hazards. Employees will not bend, recap, or remove contaminated sharps unless no alternative is feasible, and the employee can accomplish any bending, recapping or needle removal using a mechanical device or one-handed technique.
- As soon as possible after use, contaminated reusable sharps will be placed in a container that is puncture resistant, labeled or color-coded appropriately, leak-proof on the sides and bottom, constructed in a manner that does not require employees to reach into it to use it

Other Engineering and Work-Practice Controls

- Employees may not eat, drink, smoke, apply cosmetics, or handle contact lenses where occupational exposure may occur.
- No food or drink is to be stored where potentially infectious materials are present.
- Containers used to store, or transport potentially infectious materials should be closable, prevent leaks, and be appropriately labeled or color-coded. They should also be puncture resistant, if necessary.
- Employees will examine any equipment that may be contaminated before servicing or shipping and will decontaminate it as necessary and feasible. OSHA recommends this be done using a solution of one-part household bleach to 10 parts water.

- Employees engaged in cleanup operations will be provided with personal protective equipment.
- If decontamination is impossible, the employee will attach a label to the equipment, and inform all appropriate personnel of the contamination to ensure they take proper precautions.

TRAINING

All employees who have occupational exposure to bloodborne pathogens will receive training on the epidemiology, symptoms, and transmission of bloodborne pathogen diseases. All employees shall be provided training at the time of initial assignment to task where occupational exposure may take place, and at least annually thereafter. Training will be documented and retained for a minimum of three years. The employer shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation.

The Company will provide additional training when tasks or procedures are added or changed that affect the employee's occupational exposure. It is acceptable for additional training to be limited to addressing only the changes or additions to the employees' exposure.

In addition, the training program covers, at a minimum, the following elements:

- A copy and explanation of the OSHA bloodborne pathogen standard
- Explanation of The Company ECP and how to obtain a copy
- Explanation of methods to recognize tasks and other activities that may involve exposure to blood and OPIM, including what constitutes an exposure incident.
- An explanation of the modes of transmission of bloodborne pathogens
- An explanation of the use and limitations of engineering controls, work practices and PPE
- An explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE.
- The basis of PPE selection.
- Hepatitis B vaccine information.
- Appropriate actions to take and persons to contact in an emergency involving blood or OPIM.
- The procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available.
- Post-Exposure evaluation and follow-up.
- Signs and labeling.
- The person conducting the training will be knowledgeable in the subject matter of the training program as it relates to the workplace.

PERSONAL PROTECTIVE EQUIPMENT

PPE shall be provided by The Company to personnel at no cost to the worker. Moreover, workers will be trained by The Company or by a qualified trainer in the use of appropriate PPE for specific tasks or procedures.

The following list of PPE shall be made available to all personnel:

- Hard hats
- Goggles
- Gloves
- Reflective vests
- Fall-arrest
- Lanyards
- Fire retardant clothing
- Reinforced footwear as needed.

Additional PPE shall be stored at Office, shop, vehicles and worksites. **Joaquin Blas** is responsible for making all PPE available to personnel and for keeping all PPE in safe working condition. Workers who notice PPE in disrepair or in non-working order, shall notify **Joaquin Blas** to the defective equipment replaced or repaired.

The following work procedures and precautions shall be followed by all personnel:

- Wash hands immediately or as soon as feasible after removing gloves or other PPE.
- Remove PPE after it becomes contaminated and before leaving the work area.
- Used PPE may be disposed of in designated containers for storage, laundering, decontamination or disposal.
- Wear appropriate gloves when it is reasonably anticipated that there may be hand contact with blood or OPIM
- When handling or touching contaminated items or surfaces; replace gloves if torn, punctured or contaminated
- If the ability of the gloves to function as a barrier is compromised remove immediately
- Utility gloves may be decontaminated for reuse if their integrity is not compromised
- Discard utility gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Never wash or decontaminate disposable gloves for reuse.
- Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eye, nose, or mouth.
- Remove immediately or as soon as feasible any garment contaminated by blood or OPIM, in such a way as to avoid contact with the outer surface.
- Contaminated needles and other sharps should only be handled by authorized or by trained personnel

HOUSEKEEPING

Personnel are responsible for keeping work areas clean and sanitary. All equipment and working surfaces must be cleaned and decontaminated using sanitizing cleanser after contact with blood or OPIM.

Contaminated work surfaces must be decontaminated with disinfectant upon completion of each of the following:

- Directly following the contamination or after any spill of blood or OPIM
- At the end of the work day if the surface may have become contaminated since the last cleaning.
- All waste receptacles, buckets, and other containers shall be inspected regularly, cleaned/disinfected, and decontaminated as soon as reasonably possible if the unit is visibly contaminated.
- Broken glass shall be picked up using safe equipment such as a broom, dustpan, tongs or similar piece of equipment that is probable to mitigate worker exposure and risk.
- Broken glass must not be picked up directly with the hands even if gloved.

Regulated Waste

Regulated waste is liquid or semi-liquid blood or OPIM. Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed. Regulated waste shall be placed in containers which are closeable, constructed to contain all contents and prevent leakage and appropriately labeled.

Labels

The following labeling methods are used at The Company's facilities to identify regulated waste, sharps disposal containers, contaminated laundry bags containers, potentially infectious material and equipment.

Joaquin Blas shall be responsible for ensuring that warning labels or red bags are used as required.

Personnel shall notify **Joaquin Blas** if they discover regulated waste containers, refrigerators containing blood or OPIM, contaminated equipment etc. without proper labels.

RECORDKEEPING

Training Records

Training records are completed for each employee upon successful completion of training. These documents will be kept for at least three years at the office.

Training records shall include the following information:

- Date of training
- Contents or a summary of the training
- Names and qualifications of trainer(s)
- Names and titles of all training session attendees

All training records shall be made available to all personnel upon request.

Medical Records

Medical records shall be maintained for each employee with occupational exposure in accordance with 29 CFR 1010.1020, "Access to Employee Exposure and Medical Records." Written employee consent is required prior to the release of employee medical records.

Joaquin Blas is responsible for the maintenance of required medical records. These records shall be kept confidential in accordance with HIPPA regulations for the period of employment plus thirty years. Medical records shall be provided to personnel upon request.

Sharps Injury/Exposure Incident Log

A Sharps Injury Log is a record of each exposure incident involving a sharp. The purpose of the Sharps Injury Log is to generate a record of exposure incidents that will include enough information about the cause of the incidents to allow the company to analyze them and take preventive action.
The Sharps Injury Log must include:

- The date and time of the sharps-related exposure incident
- The type and brand of the sharp involved in the incident
- A description of the incident including:
  - The job classification of the exposed employee;
  - The department or work area where the incident occurred;
  - The procedure being performed;
  - How the incident occurred;
  - The body part injured;
  - For sharps with engineered sharps injury protection (ESIP), if the safety mechanism was activated; and

- If the incident occurred before action, during activation or after activation of the mechanism. For sharps without ESIP, the employee's opinion if ESIP could have prevented the injury.

Sharps injuries/exposures must be recorded on the log within 14 working days of when the incident was reported to the company.

The Sharps Injury Log must be maintained for five years from the date of the occurrence of the exposure incident.

HEPATITIS B VACCINATION

The Company shall provide Hepatitis B vaccine to all employees that have occupational exposure at no cost to the employee(s). If not vaccinated, employees will be informed of the opportunity to be vaccinated within 24 hours of an exposure incident.

Post-Exposure Evaluation and Follow Up

Should an exposure incident occur, the employee should contact the safety coordinator (or designate) immediately.

In Case of Exposure

A licensed health care professional will conduct a confidential medical evaluation and follow-up and will provide a medical opinion on diagnosis/course of action, as soon as possible following an exposure incident. After administering initial first aid (cleaning the wound, flushing the eyes or other mucous membranes, etc.), follow the procedure below:

- Document the routes of exposure and how the exposure occurred.
- Identify and document the source individual (unless the company can establish that identification is infeasible or prohibited by state or local law).
- Obtain consent, and arrange to have the source individual tested as soon as possible, to determine HIV, HCV, and HBV infectivity, document and notify the employee's health care provider of the source individual's test results. If the source individual is known to be HIV, HCV, and/or HBV positive, new testing is not necessary.
- Provide the exposed employee with the source individual's test results and with information about applicable disclosure laws and regulations concerning the identity and infectious status of the source individual (e.g., laws protecting confidentiality).

Administrative Responsibilities Following Exposure

The Company will ensure that the health care professional responsible for post-exposure evaluation and follow-up receives the following:

- A copy of OSHA's bloodborne pathogens standard;
- A description of the employee's job duties relevant to the exposure incident;
- Route(s) of exposure;
- Circumstances of exposure;
- Results of the source individual's blood test if possible;
- Relevant employee medical records, including vaccination status; and
- The Company will provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

Counseling

The Company will ensure that post-exposure counseling will be given to employees following an exposure incident. Counseling should include Centers for Disease Control & Prevention (CDC) recommendations for prevention and transmission of bloodborne infections including HIV, HBV, and HCV. Counseling must be made available regardless of the employee's decision to accept serological testing.

Cal/OSHA Trenching, Shoring and Excavation

PURPOSE

The purpose of this document is to outline safety policy and procedures for the protection of employees working in and around excavations and trenches for **Pacific Northwest Towers**; hereafter referred to as "The Company."

This program pertains to all of The Company projects that require any excavations or trenching work.

RESPONSIBILITIES

It is the responsibility of each superintendent and supervisor to implement and maintain the procedures and steps set forth in this program. Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this program.

HAZARDS

One of the reasons the company requires a competent person on-site during excavation and trenching are the numerous potential hazardous that may be encountered or created. Hazards include:

- Electrocution
- Gas Explosion
- Entrapment
- Struck by equipment
- Suffocation

HAZARD CONTROLS

Before any work is performed and before any employees enter the excavation, a number of items must be checked and insured:

- Before any excavation, underground installations must be determined. This can be accomplished by either contacting the local utility companies or the local "one-call' center for the area. All underground utility locations must be documented on the proper forms. All overhead hazards (surface encumbrances) that create a hazard to employees must be removed or supported to eliminate the hazard.
- All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.
- If the excavation is to be over 20 feet deep, it must be designed by a registered professional engineer who is registered in the state where work will be performed.

- Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding.
- The worksite must be analyzed in order to design adequate protection systems and prevent cave-ins. There must also be an excavation safety plan developed to protect employees.
- Workers must be supplied with and wear any personal protective equipment deemed necessary to assure their protection.
- Protection shall be provided by placing and keeping such materials or equipment at least 2 feet 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.
- If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel any more than 25 feet of lateral travel to reach the stairway, ramp, or ladder.
- No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees.
- Employees must be protected from water accumulation, including the use of shields, and must be inspected by a competent person before work begins.
- 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.
- A competent person will inspect all excavations and trenches daily, prior to employee exposure or entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate any and all hazards.
- Soil classifications must be determined by testing and protective systems designed according to the soil classifications.
- The company forbids work in excavations in which water has accumulated, or in which water is accumulating, unless adequate protections are in place to protect company workers.
- Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. If the atmosphere is inadequate, protective systems will be utilized.
- If work is in or around traffic, employees must be supplied with and wear orange reflective vests. Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians.

COMPETENT PERSONS RESPONSIBILITIES

The OSHA Standards require that the competent person must be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and have authorization to take prompt corrective measures to eliminate them and, if necessary, to stop the work.
Competent persons should examine the possibility of cave-ins, failures or protective systems, etc. If problems are found, provisions should be made for immediate personnel removal.

The competent person should be specified, and his duties described. Duties might include inspections prior to entry, atmospheric testing, removal of workers if conditions dictate.

A competent person is required to:

- Have a complete understanding of the applicable safety standards and any other data provided.
- Assure the proper locations of underground installations or utilities, and that the proper utility companies have been contacted.
- The approximate location of subsurface installations, such as sewer, telephone, fuel, electric, water lines, or any other subsurface installations that reasonably may be expected to be encountered during excavation work, shall be determined by the excavator prior to opening an excavation.
- Conduct soil classification tests and reclassify soil after any condition changes.
- Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection.
- Conduct all air monitoring for potential hazardous atmospheres.
- Conduct daily and periodic inspections of excavations and trenches.
- Approve design of structural ramps, if used.

EXCAVATION PLANS

An excavation safety plan is required in written form. This plan is to be developed to the level necessary to ensure complete compliance with the OSHA Excavation Safety Standard and state and local safety standards.

Excavation Safety Plan Factors

- Utilization of the local one-call system
- Determination of locations of all underground utilities
- Consideration of confined space atmosphere potential
- Proper soil protection systems and personal protective equipment and clothing
- Determination of soil composition and classification
- Determination of surface and subsurface water
- Depth of excavation and length of time it will remain open

- Proper adherence to all OSHA Standards, this excavation and trenching safety program, and any other coinciding safety programs

CLASSIFICATION OF SOILS

The OSHA Standards define soil classifications within the Simplified Soil Classification Systems, which consist of four categories: Stable rock, Type A, Type B, and Type C. Stability is greatest in stable rock and decreases through Type A and B to Type C, which is the least stable. Appendix A of the Standard provides soil mechanics terms and types of field tests used to determine soil classifications.

Stable rock is defined as natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Soil classifications must be determined by testing and protective systems designed according to soil classifications.

Type A soil is defined as:

- Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater.
- Cemented soils like caliche and hardpan are considered Type A.

Soil is NOT Type A if:

- It is fissured.
- The soil is subject to vibration from heavy traffic, pile driving or similar effects.
- The soil has been previously disturbed.
- The material is subject to other factors that would require it to be classified as a less stable material.
- The exclusions for Type A most generally eliminate it from most construction situations.

Type B soil is defined as:

- Cohesive soil with an unconfined compressive strength greater than .5 TSF, but less than 1.5 TSF.
- Granular cohesionless soil including angular gravel, silt, silt loam, and sandy loam.
- The soil has been previously disturbed except that soil classified as Type C soil.
- Soil that meets the unconfined compressive strength requirements of Type A soil but is fissured or subject to vibration.
- Dry rock that is unstable.

Type C soil is defined as:

- Cohesive soil with an unconfined compressive strength of .5 TSF or less.
- Granular soils including gravel, sand and loamy sand.

- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.

ADDITIONAL SOIL

Soil classifications must be determined by testing and protective systems designed according to soil classifications. The most stable type of soil is Type A. It is dense and heavy and consists primarily of clay. Type B has a medium level of stability and is made of soils such as silt, sandy loam, and medium clay. The least stable soil is Type C, which consists of gravel, loamy sand, and soft clay.

SOIL TEST AND IDENTIFICATION

The competent person will classify the soil type in accordance with the definitions in Appendix A on the basis of at least one visual and one manual analysis. These tests should be run on freshly excavated samples from the excavation and are designed to determine stability based on a number of criteria: the cohesiveness, the presence of fissures, the presence and amount of water, the unconfined compressive strength, the duration of exposure, undermining, and the presence of layering, prior excavation and vibration.

The cohesion tests are based on methods to determine the presence of clay. Clay, silt, and sand are size classifications, with clay being the smallest sized particles, silt intermediate and sand the largest. Clay minerals exhibit good cohesion and plasticity (can be molded). Sand exhibits no elasticity and virtually no cohesion unless surface wetting is present. The degree of cohesiveness and plasticity depend on the amounts of all three types and water.

When examining the soil, three questions must be asked: Is the sample granular or cohesive? Fissured or non-fissured? What is the unconfined compressive strength measured in TSF?

The location of underground installations shall be determined before excavation. When utility companies or clients cannot respond to a request to locate underground utility installations within 24 hours, or cannot establish 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.

METHODS OF TESTING SOIL

- **Visual Test -** If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular.
- **Wet Manual Test -** Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular.

- **Dry Strength Test -** Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks.
- **Pocket Penetrometer Test -** This instrument is most accurate when soil is nearly saturated. This instrument will give unconfined compressive strength in tons per square foot. The spring-operated device uses a piston that is pushed into a coil up to a calibration groove. An indicator sleeve marks and retains the reading until it is read. The reading is calibrated in tons per square foot (TSF) or kilograms per cubic centimeter.
- **Thumb Penetration Test -** The competent person attempts to penetrate a fresh sample with thumb pressure. If the sample can be dented, but penetrated only with great effort, it is Type A. If it can be penetrated several inches and molded by light pressure, it is Type C. Type B can be penetrated with effort and molded.
- **Shearvane Test -** Measures the approximate shear strength of saturated cohesive soils. The blades of the vane are pressed into a flat section of undisturbed soil, and the knob is turned slowly until soil failure. The dial is read directly when using the standard vane. The results will be in tons per square foot or kilograms per cubic centimeter.

Whenever testing, there should be some means to protect against falls. Examples could include railings or guardrails.

The competent person will perform several tests of the excavation to obtain consistent, supporting data along its depth and length. The soil is subject to change several times within the scope of an excavation and the moisture content will vary with weather and job conditions. The competent person must also determine the level of protection based on what conditions exist at the time of the test and allow for changing conditions.

Tests should be conducted for air contaminants (oxygen, flammable gases, etc. and provide ventilation where necessary.

EXCAVATION PROTECTION PROCESS

The three basic protective systems for excavations and trenches are sloping and benching systems, shoring, and shields.

The protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to or transmitted to the system. Every employee in an excavation shall be protected from cave-ins by an adequate protective system.

- Exceptions to using protective system:
- Excavations are made entirely in stable rock
- Excavations are less than 5 feet deep and declared safe by a competent person

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

Employees should not work under loads of digging equipment where loads may fall.

SLOPING AND BENCHING SYSTEMS

There are four options for sloping:

- Slope to the angle required by the Standard for Type C, which is the most unstable soil type.
- The table provided in Appendix B of the Standard may be used to determine the maximum allowable angle (after determining the soil type).
- Tabulated data prepared by a registered professional engineer can be utilized.
- A registered professional engineer can design a sloping plan for a specific job.

Sloping and benching systems for excavations five (5) to twenty (20) feet in depth must be constructed under the instruction of a designated competent person.

Sloping and benching systems for excavations greater than twenty (20) feet must be designed and stamped by a registered professional engineer.

Sloping and benching specifications can be found in Appendix B of the OSHA Standard (Subpart P).

SHORING

Shoring is another protective system or support system. Shoring utilizes a framework of vertical members (uprights), horizontal members (whales), and cross braces to support the sides of the excavation to prevent a cave-in. Metal hydraulic, mechanical or timber shoring is common examples.

The different examples of shoring are found in the OSHA Standard under these appendices:

APPENDIX C – Timber Shoring for Trenches
APPENDIX D – Aluminum Hydraulic Shoring for Trenches
APPENDIX E – Alternatives to Timber Shoring

SHEILD SYSTEMS (TRENCH BOXES)

Shielding is the third method of providing a safe workplace. Unlike sloping and shoring, shielding does not prevent a cave-in. Shields are designed to withstand the soil forces caused by a cave-in and protect the employees inside the structure. Most shields consist of two flat, parallel metal walls that are held apart by metal cross braces.

Shielding design and construction is not covered in the OSHA Standards. Shields must be certified in design by a registered professional engineer and must have either a registration plate on the shield or registration papers from the manufacturer on file at the jobsite office. **ANY REPAIRS OR MODIFICATIONS MUST BE APPROVED BY THE MANUFACTURER.**

SAFETY PRECAUTIONS FOR SHEILD SYSTEMS

- Shields must not have any lateral movement when installed.
- Employees will be protected from cave-ins when entering and exiting the shield (examples - ladder within the shield or a properly sloped ramp at the end).
- Employees are not allowed in the shield during installation, removal, or during any vertical movement.
- Shields can be 2 ft. above the bottom of an excavation if they are designed to resist loads at the full depth and if there are no indications of caving under or behind the shield.
- The shield must extend at least 18 inches above the point where proper sloping begins (the height of the shield must be greater than the depth of the excavation).
- The open end of the shield must be protected from the exposed excavation wall. The wall must be sloped, shored, or shielded. Engineer designed end plates can be mounted on the ends of the shield to prevent cave-ins.

Whenever internal combustion engine-driven equipment is operated inside a shaft, a ventilation system shall be provided.

PERSONAL PROTECTIVE EQUIPMENT

It is The Company policy to wear a hard hat, safety glasses, and work boots on the jobsite. Because of the hazards involved with excavations, other personal protective equipment may be necessary, depending on the potential hazards present (examples -goggles, gloves, and respiratory equipment).

INSPECTIONS

Daily inspection of excavations, the adjacent areas and protective systems shall be made by the competent person for evidence of a situation that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions. * Testing and controls shall be put in place to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions.

- All inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift.
- Inspections will be made after every rainstorm or any other increasing hazard.

- All documented inspections will be kept on file in the jobsite safety files and forwarded to the Safety Director weekly.
- A copy of the Daily Excavation Inspection form is located at the end of this program.

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.

Where employees or equipment are required or permitted to cross over excavations over 6-feet in depth and wider than 30 inches, walkways or bridges with standard guardrails shall be provided.

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.

RESCUE EQUIPMENT

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.

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.

VEHICLE 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.

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.

TRAINING

The competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply (examples Hazard Communication, Confined Space, and Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the programs and the hazards associated.

All other employees working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating.

Employees who are involved in the excavation operation and exposed to excavation operation hazards shall be trained in the excavator notification and excavation practices.

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.

DEFINITIONS

Benching - 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 - 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 failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent Person - 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.

Duration of Exposure - The longer an excavation is open, the longer the other factors have to work on causing it to collapse.
Excavation - Any man-made cut, trench, or depression in an earth surface, formed by earth removal.

Hazardous Atmosphere - 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.

Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from 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 necessary protection.

Shield - A structure that is capable of withstanding the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. All shields must be in accordance with 29 CFR 1926.652(c)3 or (c)4.

Sloping - A method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.

Surcharge Loads - Generated by the weight of anything in proximity to the excavation, push starts for a cave-in (anything up top pushing down). Common surcharge loads:

- Weight of spoil pile
- Weight of nearby buildings, poles, pavement, or other structural objects.
- Weight of material and equipment

Trench - A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.

Undermining - Undermining can be caused by such things as leaking, leaching, caving or over-digging. Undermined walls can be very dangerous.

Vibration - A force that is present on construction sites and must be considered. The vibrations caused by backhoes, dump trucks, compactors and traffic on job sites can be substantial.

Crane, Derrick and Hoist Safety

PURPOSE

To outline the Crane, Derrick and Hoist Safety Program for **Pacific Northwest Towers**; hereafter referred to as "The Company." The Company policy is to maintain a safe workplace for its employees; therefore, only qualified, and licensed individuals shall operate these devices. The safety rules and guidance in this program apply to all operations at The Company that involve the use of cranes and hoists installed in or attached to buildings and to all The Company employees, supplemental labor, and subcontractor personnel who use such devices.

OSHA's Definition of a Crane - A crane is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes whether fixed or mobile are driven manually or by power.

RESPONSIBILITIES

Supervisors

- Ensuring that employees under their supervision receive the required training and are certified and licensed to operate the cranes and hoists in their areas
- Providing training for prospective crane and hoist operators. This training must be conducted by a qualified, designated instructor who is a licensed crane and hoist operator and a full-time employee
- Evaluating crane and hoist trainees using the Crane Safety Checklist and submitting the Qualification Request Form to the Safety Office to obtain the operator's license
- Ensuring that hoisting equipment is inspected and tested monthly by a responsible individual and that rigging equipment is inspected annually

Crane and Hoist Operators

- Operating hoisting equipment safely
- Conducting functional tests prior to using the equipment
- Selecting and using rigging equipment appropriately
- Having a valid operator's license on their person while operating cranes or hoists
- Participating in the medical certification program, as required

Engineering/Maintenance/Operations Department

- Performing annual maintenance and inspection of all cranes and hoists that are not covered by a program with maintenance responsibility
- Conducting periodic and special load tests of cranes and hoists

- Maintaining written records of inspections and tests and providing copies of all inspections and test results to facility managers and building coordinators who have cranes and hoists on file
- Inspecting and load testing cranes and hoists following modification or extensive repairs (e.g., a replaced cable or hook, or structural modification)
- Scheduling a non-destructive test and inspection for crane and hoist hooks at the time of the periodic load test, and testing and inspecting before use new replacement hooks and other hooks suspected of having been overloaded.
    - The evaluation, inspection, and testing may include, but are not limited to visual, dye penetrant, and magnetic particle techniques referenced in ASME B30.10 (Hooks, Inspection and Testing)
- Maintaining all manuals for cranes and hoists in a central file for reference

Safety Officer

- Conducting training for all Crane and Hoist Operators
- Issuing licenses to Crane and Hoist Operators
- Periodically verifying monthly test and inspection reports
- Interpreting crane and hoist safety rules and standards

POLICY

All workers who use any of The Company crane or hoists shall have an operator's license. The Company issues licenses for authorized employees who have been specifically trained in crane and hoist operations and equipment safety.

TRAINING

The Company requires that company crane operators be trained and participate in competency assessments prior to working alone. Training must take place prior to a competency assessment and will consist of classroom and hands-on training

The Company shall make sure training will comprise of:

- Lubricating points,
- Adjustments,
- Principles of crane operations,
- Load charts,
- Hand signals,
- Inspections,
- Knowledge of regulatory requirements,
- Pre-use inspections,
- Use of fire extinguishers,
- Duties of the signal man,
- Below hook safety systems,

- Stop Work Authority (SWA),
- Implications of environmental and weather conditions,
- Use of lifting equipment in restricted areas,
- Visibility and communication during lifting operations,
- Proximity hazards such as electrical lines or parallel activity by others,
- Prevention of load striking persons or objects,
- Pre-checks of lifted objects for loose items,
- Attaching, securing, and detaching loads,
- Overloading and de-rating of lifting equipment,
- Overturning,
- Tilting,
- Slipping,
- Dragging loads,
- Not working under suspended loads,
- Not leaving loads suspended,
- Lifting of people,
- And tagline usage.

Refresher trainings will be required for all company crane operators every four years.

CRANE AND HOIST OPERATORS

Only designated personnel shall be permitted to operate a crane. To be qualified as a Crane and Hoist Operator, the candidate shall have received hands-on training from a licensed, qualified crane and hoist operator designated by the candidate's supervisor. Upon successful completion of training, the licensed crane and hoist operator and the candidate's supervisor will fill out and sign the Qualification Request Form and Crane Safety Checklist and send them to the Safety Office for approval. The candidate will be issued a license upon approval by the Safety Manager.

Crane and Hoist Operators must renew their license every three years by satisfying the requirements described above.

Only those employees qualified by training or experience shall be allowed to operate equipment and machinery. Operators shall be qualified/certified by one of the following methods:

- Certification by an accredited crane operator testing organization
- Qualification by an audited employer program
- Qualification by the U.S. military
- Licensing by a government entity

CRANE AND HOIST SAFETY DESIGN REQUIREMENTS

Following are the design requirements for cranes and hoists and their components:

- The design of all commercial cranes and hoists shall comply with the requirements of ASME/ANSI B30 standards and Crane Manufacturer's Association of America standards (CMAA-70 and CMAA-74). **Pacific Northwest Towers** -fabricated lifting equipment shall comply with the requirements in Chapter 2.2 (Lifting Equipment) of Mechanical Engineering *Design Safety Standards* (latest edition).
- All crane and hoist hooks shall have safety latches.
- The crane hook shall have a self-closing latch and the latch shall not be blocked open at any time. 1926.1433(d)(4)
- Hooks shall not be painted (or re-painted) if the paint previously applied by the manufacturer is worn.
- Crane pendants shall have an electrical disconnect switch or button to open the main-line control circuit.
- Cranes and hoists shall have a main electrical disconnect switch. This switch shall be in a separate box that is labeled with lockout capability.
- Crane bridges and hoist monorails shall be labeled on both sides with the maximum capacity.
- Each hoist-hook block shall be labeled with the maximum hook capacity.
- Directional signs indicating N-W-S-E shall be displayed on the bridge underside, and a corresponding directional label shall be placed on the pendant.
- A device such as an upper-limit switch or slip clutch shall be installed on all building cranes and hoists. A lower-limit switch may be required when there is insufficient hoist rope on the drum to reach the lowest point.
- All cab and remotely operated bridge cranes shall have a motion alarm to signal bridge movement.
- All newly installed cranes and hoists, or those that have been extensively repaired or rebuilt structurally, shall be load tested at 125% capacity prior to being placed into service.
- If an overload device is installed, a load test to the adjusted setting is required.
- Personnel baskets and platforms suspended from any crane shall be designed in accordance with the specifications by The Company.

PERSONAL PROTECTIVE EQUIPMENT

General Recommendations

The general PPE is recommended for all response/recovery tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below.

General PPE includes:

- Hard hat for overhead impact or electrical hazards
- Eye protection with side shields

- Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted)
- ANSI-approved protective footwear
- Respiratory protection as necessary-N, R, or P95, filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt and silt) and mold (except mold remediation)
    - Filters with a charcoal layer may be used for odors.

SPECIFIC HAZARD PPE REQUIREMENTS

Lifting Workers Using Cranes

Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed).

Work Zone Safety

ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear.

Hearing Protection

Hearing protection when working around potential noise sources and when noise levels exceed 90dBA. If you cannot hold a conversation in a normal speaking voice with a person who is standing at arms-length (approximately 3 feet), the noise level may exceed 90 dBA.

Discovering Unknown Chemicals

Evaluate the need to revise protective clothing, respirator, and glove selection.

GENERAL SAFETY RULES

Operators shall comply with the following rules while operating the cranes and hoists:

- Do not engage in any practice that will divert your attention while operating the crane.
- Respond to signals only from the person who is directing the lift or any appointed signal person. Always obey a stop signal, no matter who gives it.
- Do not move a load over people:
    - People shall not be placed in jeopardy by being under a suspended load.
    - Do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight.
    - Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.
- Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded. Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight.

- Check that all controls are in the OFF position before closing the main-line disconnect switch.
- If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire

Avoid Side Pulls
These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.

To Prevent Shock Loading, Avoid Sudden Stops or Starts

- Make no sudden acceleration or deceleration of the moving load.
- Ensure load does not contact any obstructions.
- Cranes shall not be used for side pulls except when specifically authorized by a responsible person, no hoisting, lowering, traveling while an employee is on the load or hook.
- Operator avoids carrying loads over people, load shall not be lowered where there is less than two full wraps of rope on the hoisting drum.
- Operator does not leave his position at the controls while the load is suspended.

Shock loading can occur when a suspended load is accelerated or decelerated and can overload the crane or hoist. When completing an upward or downward motion, ease the load slowly to a stop.

Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer’s specifications for adequate support and degree of level of the equipment are met.

The manufacturer's procedures and prohibitions must be complied with when assembling and disassembling equipment.

The assembly/disassembly of equipment must be directed by a competent and qualified person. The A/D director must be knowledgeable in the processes and procedures involved in the assembly and disassembly of the crane.

The competent person deemed the A/D director is required to review the A/D processes and procedures prior to commencing operations unless he or she understands and is familiar with the applicable processes and procedures and has experience in A/D operations regarding the same type and configuration of the crane and associated equipment.

The work zone shall be identified by demarcating boundaries such as flag and range limiting devices or defining the work zone as 360 degrees around the equipment up to the maximum working radius. The hazard assessment must determine if any part of the equipment could get closer than 20 feet to a power line.

All manufacturer procedures applicable to the operational functions of equipment, including its use with attachments, must be complied with.

A CO2, dry chemical, or equivalent fire extinguisher shall be kept in the crane cab or vicinity of the crane.

Operating and maintenance personnel shall receive training and be made familiar with the use and care of the fire extinguishers provided.

A competent person performs a documented inspection, at least monthly. The inspection documentation must at a minimum include the name and signature of the competent person conducting the inspection, date, items inspected, and the findings of the inspection.

The Company shall maintain the inspection records for a minimum of three months. A daily inspection by a competent person can be utilized in lieu of the monthly inspection if the daily inspection contains the same required information.

GENERAL REQUIREMENTS

Wind Indicators and Rail Clamps

Outdoor storage bridges shall be provided with automatic rail clamps. A wind-indicating device shall be provided which will give a visible or audible alarm to the bridge operator at a predetermined wind velocity. If the clamps act on the rail heads, any beads or weld flash on the rail heads shall be ground off.

Clearance From Obstruction

Minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with Crane Manufacturers Association of America, Inc.

Where passageways or walkways are provided obstructions shall not be placed so that safety of personnel will be jeopardized by movements of the crane.

Clearance Between Parallel Cranes

If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.

Note: Only designated personnel shall be permitted to operate a crane covered by this section.

Cab Location

The general arrangement of the cab and the location of control and protective equipment shall be such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions.

The cab shall be located to afford a minimum of 3 inches clearance from all fixed structures within its area of possible movement.

Access to Crane

Access to the car and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform requiring no step over any gap exceeding 12 inches (30 cm).

Fire Extinguisher

Carbon tetrachloride extinguishers shall not be used.

Lighting

Light in the cab shall be sufficient to enable the operator to see clearly enough to perform his work.

FOOTWALKS AND LADDERS

Location of Footwalks

If sufficient headroom is available on cab-operated cranes, a footwalk shall be provided on the drive side along the entire length of the bridge of all cranes having the trolley running on the top of the girders. Where footwalks are, in no case shall less than 48 inches of headroom be provided.

Construction of Footwalks

Footwalks shall be of rigid construction and designed to sustain a distributed load of at least 50 pounds per square foot. Footwalks shall have a walking surface of anti-slip type.

The inner edge shall extend at least to the line of the outside edge of the lower cover plate or flange of the girder.

Ladders and Stairways

Gantry cranes shall be provided with ladders or stairways extending from the ground to the footwalk or cab platform.

Stairways shall be equipped with rigid and substantial metal handrails. Walking surfaces shall be of an anti-slip type.

Ladders shall be permanently and securely fastened in place.

STOPS, BUMPERS, RAIL SWEEPS, AND GUARDS

Trolley Stops

Stops shall be provided at the limits of travel of the trolley. Stops shall be fastened to resist forces applied when contacted. A stop engaging the tread of the wheel shall be of a height at least equal to the radius of the wheel.

Bridge Bumpers

A crane shall be provided with bumpers or other automatic means providing equivalent effect, unless the crane travels at a slow rate of speed and has a faster deceleration rate due to the use of sleeve bearings, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance by the nature of the crane operation and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the crane (not including the lifted load) at an average rate of deceleration not to exceed 3 ft/s/s when traveling in either direction at 20 percent of the rated load speed.

The bumpers shall have sufficient energy absorbing capacity to stop the crane when traveling at a speed of at least 40 percent of rated load speed. The bumper shall be so mounted that there is no direct shear on bolts. Bumpers shall be so designed and installed as to minimize parts falling from the crane in case of breakage.

Trolley Bumpers

A trolley shall be provided with bumpers or other automatic means of equivalent effect, unless the trolley travels at a slow rate of speed, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance of the runway and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the trolley (not including the lifted load) at an average rate of deceleration not to exceed 4.7 ft/s/s when traveling in either direction at one-third of the rated load speed.

When more than one trolley is operated on the same bridge, each shall be equipped with bumpers or equivalent on their adjacent ends.

Bumpers or equivalent shall be designed and installed to minimize parts falling from the trolley in case of age.

Rail sweeps. Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

Guards for Hoisting Ropes

If hoisting ropes run near enough to other parts to make fouling or chafing possible, guards shall be installed to prevent this condition. A guard shall be provided to prevent contact between bridge conductors and hoisting ropes if they could come into contact.

Guards for Moving Parts

Exposed moving parts such as gears, set screws, projecting keys, chains, chain sprockets, and reciprocating components which might constitute a hazard under normal operating conditions shall be guarded.

Guards Shall be Securely Fastened

Each guard shall be capable of supporting without permanent distortion the weight of a 200-pound person unless the guard is located where it is impossible for a person to step on it.

BREAKS

Brakes for Hoists

Each independent hoisting unit of a crane shall be equipped with at least one self-setting brake, hereafter referred to as a holding brake, applied directly to the motor shaft or some part of the gear train.
Each independent hoisting unit of a crane, except worm-geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction shall, in addition to a holding brake, be equipped with control braking means to prevent over speeding.

Holding Brakes

Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied:

- 125 percent when used with a control braking means other than mechanical
- 100 percent when used in conjunction with a mechanical control braking means
- 100 percent each if two holding brakes are provided

Holding brakes on hoists shall have ample thermal capacity for the frequency of operation required by the service. Holding brakes on hoists shall be applied automatically when power is removed.

Where necessary holding brakes shall be provided with adjustment means to compensate for wear. The wearing surface of all holding-brake drums or discs shall be smooth.

Each independent hoisting unit of a crane handling hot metal and having power control braking means shall be equipped with at least two holding brakes.

Control Braking
A power control braking means such as regenerative, dynamic or counter torque braking, or a mechanically controlled braking means shall be capable of maintaining safe lowering speeds of rated loads.

The control braking means shall have ample thermal capacity for the frequency of operation required by service.

Brakes for Trolleys and Bridges
Foot-operated brakes shall not require an applied force of more than 70 pounds to develop manufacturer's rated brake torque.

Brakes may be applied by mechanical, electrical, pneumatic, hydraulic, or gravity means. Where necessary brakes shall be provided with adjustment means to compensate for wear.

The wearing surface of all brake drums or discs shall be smooth. All foot-brake pedals shall be constructed so that the operator's foot will not easily slip off the pedal. Foot-operated brakes shall be equipped with automatic means for positive release when pressure is released from the pedal.

Brakes for stopping the motion of the trolley or bridge shall be of sufficient size to stop the trolley or bridge within a distance in feet equal to 10 percent of full load speed in feet per minute when traveling at full speed with full load.

If holding brakes are provided on the bridge or trolleys, they shall not prohibit the use of a drift point in the control circuit.

Brakes on trolleys and bridges shall have ample thermal capacity for the frequency of operation required by the service to prevent impairment of functions from overheating.

Application of Trolley Brakes
On cab-operated cranes with cab on trolley, a trolley brake is required. A drag brake may be applied to hold the trolley in a desired position on the bridge and to eliminate creep with the power off.

Application of Bridge Brakes
On cab-operated cranes with cab on bridge, a bridge brake is required as specified. On cab-operated cranes with cab on trolley, a bridge brake of the holding type shall be required. On all floor, remote and pulpit-operated crane bridge drives, a brake of non-coasting mechanical drive shall be provided.

CONTROLLERS

Cranes not equipped with spring-return controllers or momentary contact pushbuttons shall be provided with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the "off" position, or a reset switch or button is operated.

Lever operated controllers shall be provided with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position. An "off" detent or spring return arrangement is acceptable.

The controller operating handle shall be located within convenient reach of the operator. As far as practicable, the movement of each controller handle shall be in the same general directions as the resultant movements of the load.

The control for the bridge and trolley travel shall be so located that the operator can readily face the direction of travel.

For floor-operated cranes, the controller, or controllers if rope operated, shall automatically return to the "off" position when released by the operator. Pushbuttons in pendant stations shall return to the "off" position when pressure is released by the crane operator.
Automatic cranes shall be so designed that all motions shall fail-safe if any malfunction of operation occurs.

Remote-operated cranes shall function so that if the control signal for any crane motion becomes ineffective the crane motion shall stop.

RESISTORS

Enclosures for resistors shall have openings to provide adequate ventilation and shall be installed to prevent the accumulation of combustible matter too near to hot parts. Resistor units shall be supported to be as free as possible from vibration.

Provision shall be made to prevent broken parts or molten metal falling upon the operator or from the crane.

SHEAVES

Sheave grooves shall be smooth and free from surface defects which could cause rope damage. Sheaves carrying ropes which can be momentarily unloaded shall be provided with close-fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again.

The sheaves in the bottom block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.

Pockets and flanges of sheaves used with hoist chains shall be of such dimensions that the chain does not catch or bind during operation.

All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings meet this requirement.

GROUND CONDITIONS

Ground Conditions - The ability of the ground to support the equipment (including slope, compaction, and firmness).

Supporting Materials - Blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.

Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. CFR 1926.1402 (b)(c)

ASSEMBLY/DISASSEMBLY

Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all the following:

- Their tasks
- The hazards associated with their tasks
- The hazardous positions/locations that they need to avoid

Protecting Crew Members Out of Operator View

Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location.

Where the operator knows that a crew member went to a location, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.

The employee to oversee Assembly/Disassembly when performing covered tasks shall be a Competent Employee appointed by The Company.

IDENTIFYING THE WORK ZONE

The work zone must be identified by either demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or b) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.

The Company shall Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, The Company shall meet the requirements in the following Options:

Option (1) - Deenergize and Ground
Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.

Option (2) – 20-Foot Clearance
Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power.

Option (3) - Table A Clearance
Determine the line's voltage and the minimum approach distance permitted. Determine if any part of the equipment, load line or load, while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted. If so, then the employer must ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance. CFR 1926.1408 (a),(b)

TABLE A—MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

OPERATION RULES

The operator shall have access to a substantial and durable chart with clearly legible letters. Figures shall be provided with each crane and securely fixed to the crane cab in a location easily visible to the operator while seated at this control station as well as procedures applicable to the operation of the equipment.

Procedures include rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual. The operator's manual must be always readily available in the cab of the crane. Whenever there is a safety concern, the operator is granted the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

The Safety Officer or competent person available on the worksite shall identify hazard areas by marking the boundaries of the crane swing radius with warning lines, railings or similar barriers. Workers within proximity of the operational equipment shall not stand or work within this safety boundary or at any place where the potential to be struck by, pinched, or crushed by the equipment or other related moving parts.

The Company shall train each employee assigned to work on or near the equipment and erect and maintain control lines, warning lines, railings, or similar barriers to mark the boundaries of the hazard areas, unless it is not feasible. Only employees essential to the operation are permitted in the fall zone.

PRE-OPERATIONAL TEST

At the start of each work shift, operators shall do the following steps before making lifts with any crane or hoist:

- Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips.
- Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.
- If provided, test the lower-limit switch.
- Test all direction and speed controls for both bridge and trolley travel.
- Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.
- Test the pendant emergency stop.
- Test the hoist brake to verify there is no drift without a load.
- If provided, test the bridge movement alarm.
- Lock out and tag for repair any crane or hoist that fails any of the above tests.

If it is determined that any part of the equipment, load line or load could get closer than 20 feet to a power line then at least one of the following measures must be taken:

- Ensure the power lines have been de-energized and visibly grounded.
- Ensure no part of the equipment, load line or load gets closer than 20 feet to the power line.
- Determine the line's voltage and minimum approach distance permitted.

OPERATIONAL AIDS

Operational aids are required on all equipment. Operations must not begin unless the operational aids are in proper working order, except where an operational aid is being repaired The Company uses the specified temporary alternative measures.

Load Charts

The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be always readily available in the cab for use by the operator. 1926.1417(c)(1)

MOVING LOAD

- Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted Inspect the drum to verify that the cable is in the grooves.
- Use a tag line when loads must traverse long distances or must otherwise be controlled. Manila rope may be used for tag lines.
- Plan and check the travel path to avoid personnel and obstructions.
- Lift the load only high enough to clear the tallest obstruction in the travel path.
- Start and stop slowly.
- Land the load when the move is finished. Choose a safe landing.

Never Leave Suspended Loads Unattended

In an emergency where the crane or hoist has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides. Lock open and tag the crane or hoist's main electrical disconnect switch.

PARKING CRANE AND HOIST

- Remove all slings and accessories from the hook. Return the rigging device to the designated storage racks.
- Raise the hook at least 2.1 m (7-ft) above the floor.
- Store the pendant away from aisles and work areas or raise it at least 2.1 m (7 ft) above the floor.

RIGGING

General Rigging Safety Requirements

Only select rigging equipment that is in good condition. All rigging equipment shall be inspected annually; defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. The load capacity limits shall be stamped or affixed to all rigging components.

The Company policy requires a minimum safety factor of 5 to be maintained for wire rope slings.

Nylon slings with the following shall be rejected destroyed:

- Abnormal wear
- Torn stitching
- Broken or cut fibers
- Discoloration or deterioration

Wire-rope slings with the following shall be rejected destroyed:

- Kinking, crushing, bird caging, or other distortions
- Evidence of heat damage
- Cracks, deformation, or worn end attachments
- Six randomly broken wires in a single rope lay
- Three broken wires in one strand of rope
- Hooks opened more than 15% at the throat
- Hooks twisted sideways more than 10deg. from the plane of the unbent hook

Alloy steel chain slings with the following shall be rejected destroyed:

- Cracked, bent, or elongated links or components
- Cracked hooks
- Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed

RIGGING A LOAD

Do the following when rigging a load:

- Determine the weight of the load. Do not guess.
- Determine the proper size for slings and components.
- Do not use manila rope for rigging.
- Make sure that shackle pins and shouldered eyebolts are installed in accordance with the manufacturer's recommendations.
- Make sure that ordinary (shoulder less) eyebolts are threaded in at least 1.5 times the bolt diameter.
- Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.

- Pad sharp edges to protect slings. Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- Do not use slings, eyebolts, shackles, or hooks that have been cut, welded, or brazed.
- Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.
- Determine the center of gravity and balance the load before moving it.
- Initially lift the load only a few inches to test the rigging and balance.

RIGGERS

The Company shall ensure only qualified riggers are used during hoisting activities for assembly and disassembly. Additionally, qualified riggers are required whenever workers are within the fall zone and hooking, unhooking, or guiding a load, or doing the initial connection of a load to a component or structure.

Qualified Rigger

A qualified rigger is a rigger who meets the criteria for a qualified person. Employers must determine whether a person is qualified to perform specific rigging tasks. Each qualified rigger may have different credentials or experience.

A qualified rigger is a person that:

- Possesses a recognized degree, certificate, or professional standing, or
- Has extensive knowledge, training, and experience, and
- Can successfully demonstrate the ability to solve problems related to rigging loads.

The person designated as the qualified rigger must have the ability to properly rig the load for a particular job. It does not mean that a rigger must be qualified to do every type of rigging job.

Each load that requires rigging has unique properties that can range from the simple to the complex. For example, a rigger may have extensive experience in rigging structural components and other equipment to support specific construction activities. Such experience may have been gained over many years. However, this experience does not automatically qualify the rigger to rig unstable, unusually heavy, or eccentric loads that may require a tandem lift, multiple-lifts, or use of custom rigging equipment. The Company shall make sure the person can do the rigging work needed for the exact types of loads and lifts for a particular job with the equipment and rigging that will be used for that job.

Riggers do not have to be certified by an accredited organization or assessed by a third party. The Company may choose to use a third-party entity to assess the qualifications of the rigger candidate, but they are not required to do so.

A certified operator does not necessarily meet the requirements of a qualified rigger. Determining whether a person is a qualified rigger is based on the nature of the load, lift, and equipment used to hoist that load plus that person's knowledge and experience. A certified/qualified operator may meet the requirements of a qualified rigger, depending on the operator's knowledge and experience with rigging.

USE OF PERSONNEL PLATFORM

When using equipment to hoist employees, the employees must be in a personnel platform that meets the requirements. Hoisting of the personnel platform must be performed in a slow, controlled, cautious manner with no sudden movements of the equipment or the platform.

A personnel platform is not required for hoisting employees:

- Into and out of drill shafts that are up to and including 8 feet in diameter
- In pile driving operations
- Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device
- In storage-tank (steel or concrete), shaft and chimney operations

CRITICAL LIFT

A critical lift is any lift utilizing multiple cranes exceeding 75% of total capacity of the crane at lift radius over an occupied structure or public street of lifting an item of high value or long replacement time.

A critical lift procedure should contain the following, as applicable:

- Identify the items to be moved
- Special precautions, if any (such as outrigger or track cribbing for mobile cranes)
- Weight of the item and total weight of the load (For mobile cranes, see the manufacturer's instructions regarding components and attachments that must be considered as part of the load)
- Center of gravity location
- A list of each piece of equipment (e.g., crane, hoist, fork truck), accessory, and rigging component (e.g., slings, shackles, spreader bars, yokes) to be used for the lift. (This list shall identify each piece of equipment by type and rated capacity)
- Designated checkpoints and hold points and estimated instrument readings, as relevant, so that job progress can be checked against the plan

CRANE OVERLOADING

Cranes or hoists shall not be loaded beyond their rated capacity for normal operations. Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

WORKING AT HEIGHTS ON CRANES OR HOISTS

Anyone conducting maintenance or repair on cranes or hoists at heights greater than 1.8 m (6 ft) shall use fall protection. Fall protection should also be considered for heights less than 1.8 m. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building or properly secured safety nets.

Use of a crane as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible.

Workers shall not ride a moving bridge crane without an approval from the Safety Office, which shall specify the following as a minimum:

- Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged open.
- Personnel shall not use bridge cranes without a permanent platform (catwalk) as work platforms. Bridge catwalks shall have a permanent ladder access.
- Personnel shall ride seated on the floor of a permanent platform with approved safety handrails, wear safety harnesses attached to designated anchors, and be always in clear view of the crane operator.
- Operators shall lock and tag open the main (or power) disconnect switch on the bridge catwalk when the crane is parked.

HAND SIGNALS

A signal person shall be provided anytime the operator's view is obstructed, if site specific safety concerns require it, or if the operator determines that it is necessary.

Each signal person must:

- Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals
- Be competent in the application of the type of signals used
- Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads

The signal person must also be provided for the following situations:

- The point of operation is not in full view of the operator
- The view is obstructed when the equipment is traveling
- The operator or the person handling the load determines it is necessary due to site specific concerns
- Communication with multiple cranes/derricks

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio, or equivalent) is used. Signals shall be always discernible or audible. Some special operations may require addition to or modification of the basic signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator and shall not conflict with the standard signals.

Signal Person's Qualifications
The Company shall make the documentation of the signal person's qualifications available at the worksite, either in paper form or electronically. The documentation must specify each type of signaling (e.g., hand signals, radio signals, etc.) for which the signal person is qualified under the requirements of the standard.

INSPECTION, MAINTENANCE AND TESTING

A competent person must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift.

The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including control mechanisms, pressurized lines, hooks and latches, wire rope, electrical apparatus, tires (when used), and ground conditions. All tests and inspections shall be conducted in accordance with the manufacturer's recommendations.

Note: The Company shall keep and maintain written inspections made by a qualified person of any repairs or alterations in accordance with OSHA 1926.1412(b).

Equipment not in Regular Use
Equipment that has been idle for 3 months or more must be inspected by a qualified person in accordance with the requirements of 1926.1412 (h) before initial use. All cranes shall be thoroughly inspected before crane is put back in service after 3 or more months of storage. A competent person shall perform a monthly inspection prior to crane being put back in service.

FREQUENT INSPECTION

The following items shall be inspected for defects in intervals, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

- ✓ All functional operating mechanisms for maladjustment interfering with proper operation – **Daily**
- ✓ Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems – **Daily**

Hooks with deformation or cracks require:

- Visual inspection - **Daily**
- **Monthly** inspection with a certification record which includes:
  - The date of inspection
  - The signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected

Hoist Chains

Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier of the chain which was inspected.

CRANE INSPECTION

Complete inspections of the crane shall be performed at intervals, depending upon its activity, severity of service, and environment, or as specifically indicated below.

These inspections shall include the following items. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

- ✓ Deformed, cracked, or corroded members
- ✓ Loose bolts or rivets
- ✓ Cracked or worn sheaves and drums
- ✓ Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices
- ✓ Excessive wear on brake system parts, linings, pawls, and ratchets
- ✓ Load, wind, and other indicators over their full range, for any significant inaccuracies
- ✓ Gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with applicable safety requirements
- ✓ Excessive wear of chain drive sprockets and excessive chain stretch

Cranes not in Regular Use

A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be inspected before placing in service. A crane which has been idle for a period of over 6 months shall be given a complete inspection before placing in service.

Standby cranes shall be inspected at least semi-annually in accordance with requirements of this program.

HANDLING THE LOAD

Size of Load

The crane shall not be loaded beyond its rated load except for test purposes.

Attaching the Load

The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load. The load shall be attached to the load block hook by means of slings or other approved devices. Care shall be taken to make certain that the sling clears all obstacles.

Moving the Load

The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

Before starting to hoist the following conditions shall be noted:

- Hoist rope shall not be kinked.
- Multiple part lines shall not be twisted around each other.
- The hook shall be brought over the load in such a manner as to prevent swinging.

During hoisting care shall be taken that:

- There is no sudden acceleration or deceleration of the moving load.
- The load does not contact any obstructions.

Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling. The Company shall require that the operator avoid carrying loads over people.

The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.

The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.

When two or more cranes are used to lift a load one qualified responsible person shall oversee the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

The Company shall ensure that the operator does not leave his position at the controls while the load is suspended.

When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

HOIST LIMIT SWITCH

At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified.

The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control.

PREVENTIVE MAINTENANCE

The Company shall ensure a preventive maintenance program based on the crane manufacturer's recommendations shall be established.

Maintenance Procedure

Before adjustments and repairs are started on a crane the following precautions shall be taken:

- The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operations in the area.
- All controllers shall be at the off position.
- The main or emergency switch shall be open and locked in the open position.
- Warning or "out of order" signs shall be placed on the crane, also on the floor beneath or on the hook where visible from the floor.

ROPE INSPECTION

Running Ropes

A thorough inspection of all ropes shall be made at least once a month and a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the ropes which were inspected shall be kept on file where readily available to appointed personnel.

Any deterioration, resulting in appreciable loss of original strength, shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following:

- Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires
- A number of broken outside wires and the degree of distribution or concentration of such broken wires
- Worn outside wires
- Corroded or broken wires at end connections
- Corroded, cracked, bent, worn, or improperly applied end connections
- Severe kinking, crushing, cutting, or un-stranding

Other Ropes

All rope which has been idle for a period of a month or more due to shut down or storage of a crane on which it is installed shall be given a thorough inspection before it is used. This inspection shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope.

A certification record shall be available for inspection which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the rope which was inspected.

Monthly Tests and Inspections

Equipment must be inspected monthly by a competent person. The inspection must be documented. Documentation must include the following:

- ✓ Items Checked
- ✓ Results of Inspection
- ✓ Name and Signature of the Inspector

Documentation must be retained for 3 months.

Defective cranes and hoists shall be locked and tagged "out of service" until all defects are corrected. The inspector shall initiate corrective action by notifying the facility manager or building coordinator.

Annual Inspections

The Safety Department shall schedule and supervise (or perform) annual preventive maintenance (PM) and annual inspections of all cranes and hoists. The annual PM and inspection shall cover:

- ✓ Hoisting and lowering mechanisms
- ✓ Trolley travel or monorail travel
- ✓ Bridge travel
- ✓ Limit switches and locking and safety devices
- ✓ Structural members
- ✓ Bolts or rivets
- ✓ Sheaves and drums
- ✓ Parts such as pins, bearings, shafts, gears, rollers, locking devices, and clamping devices
- ✓ Brake system parts, linings, pawls, and ratchets
- ✓ Load, wind, and other indicators over their full range
- ✓ Gasoline, diesel, electric, or other power plants
- ✓ Chain-drive sprockets
- ✓ Crane and hoist hooks
- ✓ Electrical apparatus such as controller contractors, limit switches, and push button stations
- ✓ Wire rope
- ✓ Hoist chains

Safety devices are required to be on all equipment and must be in proper working order before operations begin. If any of the devices are not in proper working order the equipment must be taken out of service and operations must not resume until the device is working properly again.

Examples of safety devices may include crane level indicator, boom stops, jib stops, foot pedal brake locks, horns, etc.

LOAD TESTING

- Newly installed cranes and hoists shall be load tested at 125% of the rated capacity by designated personnel.
- Slings shall have appropriate test data when purchased. It is the responsibility of the purchaser to ensure that the appropriate test data are obtained and maintained.
- Re-rated cranes and hoists shall be load tested to 125% of the new capacity if the new rating is greater than the previous rated capacity.
- Fixed cranes or hoists that have had major modifications or repair shall be load tested to 125% of the rated capacity.
- Cranes and hoists that have been overloaded shall be inspected prior to being returned to service.

- Personnel platforms, baskets, and rigging suspended from a crane or hoist hook shall be load tested initially, then re-tested annually thereafter or at each new job site.
- All cranes and hoists with a capacity greater than 2722 kg (3 tons) should be load tested every four years to 125% of the rated capacity. Cranes and hoists with a lesser capacity should be load tested every eight years to 125% of the rated capacity.

RATED LOAD/RATED LOAD MARKING

Rated Load - The load a machine is designed to carry as usually stated on the nameplate in appropriate power units (as of horsepower for motors and engines or of kilovolt amperes for alternating-current generators) The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground or floor. 1910.179(B)(5)

DERRICKS (DEFINITIONS)

Derrick - An apparatus consisting of a mast or equivalent member held at the head by guys or braces, with or without a boom, for use with a hoisting mechanism and operating ropes.

Frame derrick - A derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to the junction of the side members, and the side members are braced or guyed from this junction point.

Basket derrick - A derrick without a boom, like a gin pole, with its base supported by ropes attached to corner posts or other parts of the structure. The base is at a lower elevation than its supports. The location of the base of a basket derrick can be changed by varying the length of the rope supports. The top of the pole is secured with multiple reeved guys to position the top of the pole to the desired location by varying the length of the upper guy lines. The load is raised and lowered by ropes through a sheave or block secured to the top of the pole.

Breast derrick - A derrick without boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block secured to the top crosspiece.

Chicago boom derrick - A boom which is attached to a structure, an outside upright member of the structure serving as the mast, and the boom being stepped in a fixed socket clamped to the upright. The derrick is complete with load, boom, and boom point swing line falls.

Gin pole derrick - A derrick without a boom. Its guys are so arranged from its top as to permit leaning the mast in any direction. The load is raised and lowered by ropes reeved through sheaves or blocks at the top of the mast.

Guy derrick - A fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load.

Shearleg derrick - A derrick without a boom and similar to a breast derrick. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.

Stiffleg - A derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast.

Appointed - means assigned specific responsibilities by The Company or the employer's representative.

Boom - A timber or metal section or strut, pivoted or hinged at the heel (lower end) at a location fixed in height on a frame or mast or vertical member, and with its point (upper end) supported by chains, ropes, or rods to the upper end of the frame, mast, or vertical member. A rope for raising and lowering the load is reeved through sheaves or a block at the boom point. The length of the boom shall be taken as the straight line distance between the axis of the foot pin and the axis of the boom point sheave pin, or where used, the axis of the upper load block attachment pin.

Boom harness - The block and sheave arrangement on the boom point to which the topping lift cable is reeved for lowering and raising the boom.

Boom point - The outward end of the top section of the boom.

Derrick bullwheel - A horizontal ring or wheel, fastened to the foot of a derrick, for the purpose of turning the derrick by means of ropes leading from this wheel to a powered drum.

Designated - Selected or assigned by The Company or The Company representative as being qualified to perform specific duties.

Eye - A loop formed at the end of a rope by securing the dead end to the live end at the base of the loop.

Fiddle block - A block consisting of two sheaves in the same plane held in place by the same cheek plates.

Foot bearing or "foot block" (sill block) is the lower support on which the mast rotates.

Gudgeon pin - A pin connecting the mast cap to the mast allowing rotation of the mast.

Guy - A rope used to steady or secure the mast or other member in the desired position.

Load, working - The external load, in pounds, applied to the derrick, including the weight of load attaching equipment such as load blocks, shackles, and slings.

Load block, lower - The assembly of sheaves, pins, and frame suspended by the hoisting rope.

Load block, upper - The assembly of sheaves, pins, and frame suspended from the boom.

Mast - The upright member of the derrick.

Mast cap (spider) - The fitting at the top of the mast to which the guys are connected.

Reeving - A rope system in which the rope travels around drums and sheaves.

Rope refers to wire rope unless otherwise specified.

Safety Hook - A hook with a latch to prevent slings or load from accidentally slipping off the hook.

Side loading - A load applied at an angle to the vertical plane of the boom.

Sill - A member connecting the foot block and stiffleg or a member connecting the lower ends of a double member mast.

Standby derrick - A derrick not in regular service which is used occasionally or intermittently as required.

Stiffleg - A rigid member supporting the mast at the head.

Swing rotation of the mast and/or boom for movements of loads in a horizontal direction about the axis of rotation.

DERRICKS (GENERAL REQUIREMENTS)

New and existing equipment." All new derricks constructed and installed on or after August 31, 1971, shall meet the design specifications of the American National Standard Safety Code for Derricks, ANSI B30.6-1969, which is incorporated by reference as specified in Sec. 1910.6.

Designated Personnel

Only designated personnel shall be permitted to operate a derrick covered by this section.

Rated Load Marking

For permanently installed derricks with fixed lengths of boom, guy, and mast, a substantial, durable, and clearly legible rating chart shall be provided with each derrick and securely affixed where it is visible to personnel responsible for the safe operation of the equipment.

The chart shall include the following data:

- Manufacturer's approved load ratings at corresponding ranges of boom angle or operating radii
- Specific lengths of components on which the load ratings are based
- Required parts for hoist reeving. Size and construction of rope may be shown either on the rating chart or in the operating manual

Nonpermanent Installations

For nonpermanent installations, the manufacturer shall provide sufficient information from which capacity charts can be prepared for the particular installation. The capacity charts shall be located at the derricks or the jobsite office.

Inspection and Inspection Classification

Prior to initial use all new and altered derricks shall be inspected to ensure compliance. Inspection procedure for derricks in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the derrick and the degree of their exposure to wear, deterioration, or malfunction.

The two general classifications are herein designated as frequent and periodic with respective intervals between inspections as defined below:

- Frequent inspection - Daily to monthly intervals
- Periodic inspection 1-to-12-month intervals, or as specified by the manufacturer

Frequent Inspection

Items such as the following shall be inspected for defects at intervals as defined above or as specifically indicated, including observation during operation for any defects which might appear between regular inspections.

Deficiencies shall be carefully examined for any safety hazard:

- ✓ All control mechanisms - Inspect daily for adjustment, wear, and lubrication
- ✓ All chords and lacing - Inspect daily, visually
- ✓ Tension in guys – Daily
- ✓ Plumb of the mast
- ✓ Deterioration or leakage in air or hydraulic systems - Daily
- ✓ Derrick hooks for deformations or cracks; for hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10 degree twist from the plane of the unbent hook
- ✓ Rope reeving; visual inspection for noncompliance with derrick manufacturer's recommendations
- ✓ Hoist brakes, clutches, and operating levers: check daily for proper functioning before beginning operations
- ✓ Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation

Periodic Inspection

Complete inspections of the derrick shall be performed at intervals depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include items such as the following. Deficiencies shall be carefully examined, and a determination made as to whether they constitute a safety hazard:

- ✓ Structural members for deformations, cracks, and corrosion
- ✓ Bolts or rivets for tightness
- ✓ Parts such as pins, bearings, shafts, gears, sheaves, drums, rollers, locking and clamping devices, for wear, cracks, and distortion
- ✓ Gudgeon pin for cracks, wear, and distortion each time the derrick is to be erected
- ✓ Powerplants for proper performance and compliance with applicable safety requirements
- ✓ Hooks
- ✓ Foundation or supports shall be inspected for continued ability to sustain the imposed loads

Derricks not in Regular Use

A derrick which has been idle for a period of 1 month or more, but less than 6 months, shall be inspected before placing in service.

A derrick which has been idle for a period of over 6 months shall be given a complete inspection before placing in service.

Standby derricks shall be inspected at least semiannually.

Testing/Operational Tests
Prior to initial use all new and altered derricks shall be tested to ensure compliance including the following functions:

- ✓ Load hoisting and lowering
- ✓ Boom up and down
- ✓ Swing
- ✓ Operation of clutches and brakes of hoist

Anchorages
All anchorages shall be approved by the appointed person. Rock and hairpin anchorages may require special testing.

Preventive Maintenance
A preventive maintenance program based on the derrick manufacturer's recommendations shall be established.

Maintenance Procedure
Before adjustments and repairs are started on a derrick the following precautions shall be taken:

- The derrick to be repaired shall be arranged so it will cause the least interference with other equipment and operations in the area.
- All hoist drum dogs shall be engaged.
- The main or emergency switch shall be locked in the open position, if an electric hoist is used.
- Warning or out of order signs shall be placed on the derrick and hoist.
- The repairs of booms of derricks shall either be made when the booms are lowered and adequately supported or safely tied off.
- A good communication system shall be set up between the hoist operator and the appointed individual in charge of derrick operations before any work on the equipment is started.
- After adjustments and repairs have been made the derrick shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed.

Adjustment and Repairs
Any unsafe conditions disclosed by inspection shall be corrected before operation of the derrick is resumed. Adjustments shall be maintained to assure correct functioning of components.

Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples of conditions requiring prompt repair or replacement:

- Hooks showing defects shall be discarded.
- All critical parts which are cracked, broken, bent, or excessively worn.
- All replacement and repaired parts shall have at least the original safety factor.

Rope Inspection
A thorough inspection of all ropes in use shall be made at least once a month and a certification record which includes the date of inspection, the signature of the person who performed the inspection, and an identifier for the ropes which were inspected shall be prepared and kept on file where readily available. Any deterioration, resulting in appreciable loss of original strength shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard.

Some of the conditions that could result in an appreciable loss of strength are the following:

- Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires
- Several broken outside wires and the degree of distribution or concentration of such broken wires
- Worn outside wires
- Corroded or broken wires at end connections
- Corroded, cracked, bent, worn, or improperly applied end connections
- Severe kinking, crushing, cutting, or unstranding

Limited Travel Ropes
Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Care shall be taken to inspect ropes at these locations.

Idle Ropes
All rope which has been idle for a period of a month or more due to shut down or storage of a derrick on which it is installed shall be given a thorough inspection before it is used. This inspection shall be for all types of deterioration. A certification record shall be prepared and kept readily available which includes the date of inspection, the signature of the person who performed the inspection, and an identifier for the ropes which were inspected.

Nonrotating Ropes
Care shall be taken in the inspection of nonrotating rope.

Derrick operations shall be directed only by the individual specifically designated for that purpose.

Handling the Load
No derrick shall be loaded beyond the rated load. When loads approach the maximum rating of the derrick, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

Attaching the load
The hoist rope shall not be wrapped around the load. The load shall be attached to the hook by means of slings or other suitable devices.

Moving the Load
The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches. Before starting to hoist, the following conditions shall be noted:

- Hoist rope shall not be kinked.
- Multiple part lines shall not be twisted around each other.
- The hook shall be brought over the load in such a manner as to prevent swinging.

During hoisting, care shall be taken that:

- There is no sudden acceleration or deceleration of the moving load
- Load does not contact any obstructions
- A derrick shall not be used for side loading except when specifically authorized by a responsible person who has determined that the various structural components will not be overstressed.
- No hoisting, lowering, or swinging shall be done while anyone is on the load or hook.
- The operator should avoid carrying loads over people.
- The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.
- Neither the load nor boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.
- When rotating a derrick, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.
- Boom and hoisting rope systems shall not be twisted.

Holding the Load
The operator shall not be allowed to leave his position at the controls while the load is suspended. People should not be permitted to stand or pass under a load on the hook. If the load must remain suspended for any considerable length of time, a dog, or pawl and ratchet, or other equivalent means, rather than the brake alone, shall be used to hold the load.

Use of Winch Heads
Ropes shall not be handled on a winch head without the knowledge of the operator. While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

Securing Boom

Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When not in use, the derrick boom shall:

- Be laid down
- Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block
- Be hoisted to a vertical position and secured to the mast

OUTRIGGERS AND STABILIZERS

When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all the following requirements must be met (except as otherwise indicated):

- The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.
- The outriggers must be set to remove the equipment weight from the wheels, except for locomotive. This provision does not apply to stabilizers.
- When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers.
- Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.

Outrigger and stabilizer blocking must be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.

MODIFICATIONS

The manufacturer must approve all modifications/additions in writing. A registered professional engineer must be qualified with respect to the equipment involved and must ensure the original safety factor of the equipment is not reduced.

The Company shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments. Where the manufacturer procedures are unavailable, a qualified person must develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments.

TAGGING OUT OF SERVICE EQUIPMENT/FUNCTIONS

Where The Company has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.

RECORDS

The Safety Department shall maintain records for all cranes, hoist and rigging equipment.

Inspection records and preventative maintenance records shall also be maintained. This includes pre-erection inspections and assessment of ground conditions.

Driving Safety

PURPOSE

This program covers safe operation and maintenance of all **Pacific Northwest Towers** vehicles except those company vehicles regulated by the Interstate Commerce Commission or US Department of Transportation. Examples of vehicles covered include company-owned-or-leased passenger vehicles, pickup trucks, light trucks and vans.

RESPONSIBILITIES

Management

- Provide annual defensive-driver training for all employees authorized to operate company vehicles.
- Train authorized employees on vehicle inspection and accident procedures.
- Maintain company vehicles is a safe condition.
- Maintain active insurance policies on all company vehicles.

Authorized Drivers

- Authorized drivers shall follow the safe driving guidelines set forth in this policy at all times.
- Operate company vehicles in a safe, responsible manner and obey all traffic laws.
- Participate in driver-training programs.
- Participate in the **Pacific Northwest Towers** drug-testing program.
- Ensure all vehicle occupants use seatbelts before moving the vehicle.
- Follow safe fueling procedures.
- Conduct a pre-use inspection before any first daily use.
- Conduct a post-use inspection after any use.
- Immediately report any safety defects or vehicle problems.
- Report use of all prescription medication.

Training

All employees authorized to operate company-owned-or-leased vehicles will participate in initial and annual driver-safety training that will include:

- Defensive driving
- Vehicle inspection
- Accident procedures
- Hazardous weather driving
- Procedure for notification of unsafe vehicle
- Backing procedures (light truck and van operators)
- Cargo area storage (light truck and van operators)
- Loading and unloading (light truck and van operators

POLICY

- Only authorized employees will drive a motor vehicle in the course and scope of work or operate a company-owned vehicle.
- Vehicles will be maintained in a safe condition at all times. In the event of an unsafe mechanical condition, the vehicle will be immediately placed out of service and the appropriate manager notified.
- Only qualified company vehicle mechanics or approved service facilities are permitted to perform maintenance on company vehicles.
- All vehicles will be operated, licensed and insured in accordance with applicable local, state and federal laws.
- All employees authorized to operate any company owned or leased vehicle will be included in the **Pacific Northwest Towers** random drug-testing program.
- All authorized employees must possess a valid state driver's license for the class vehicle authorized.
- Authorized employees must have a driving record at least equal to that required for maintaining a commercial driver's license.
- Drivers shall be appropriately assessed, licensed and trained to operate the vehicle.

DRIVER QUALIFICATION

Pacific Northwest Towers will have methods in place to:

- Ensure that background checks and MVR's (Motor Vehicle Record) checks are conducted when applicable, Ideally, five to seven years of driving history is obtained. However, some states will only provide three years of data on an MVR.
- Ensure when a driver receives a violation(s) they communicate it to **Pacific Northwest Towers**.
- Ensure that all drivers will have a current medical assessment on file.

DRIVING SAFELY

- Drivers shall not operate a motor vehicle while under the influence of alcohol, illegal drugs, or prescription or over-the-counter medications that might impair their driving skills.
- Loads shall be secure and shall not exceed the manufacturer’s specifications and legal limits for the vehicle.
- The vehicle shall be used for its purpose.
- Only hands-free cell phones may be used by drivers while the vehicle is in motion.
- Drivers shall not manipulate radios or other equipment which may cause distraction while driving.
- Drivers shall not exceed the posted speed limit and shall maintain a safe distance between other vehicles at all times.

CELL PHONES AND 2 WAY RADIOS

The Company shall communicate with drivers through cellphones and two-way radios when necessary and shall follow the requirements for use as listed below.

The two fundamentals for using two-way radios (walkie-talkies) and cell phones safely while driving:

- One touch
- No reach

Federal regulations forbid the use of cellphones and sending text messages while driving commercial vehicles. However, these statutes do not prohibit the use of two-way radios, but they do offer guidelines for keeping radio users safe while driving on company business.

According to federal regulators, the two greatest risks of using a cell phone while driving are reaching to grab one and using more than one button to operate it. Commercial drivers are allowed to use hands-free phones, provided they can operate the phone without reaching and by touching a single button.

These same concepts apply to the safe use of two-way radios while driving.

STARTING

- Conduct pre-use inspection.
- Seatbelts shall be worn by all occupants, at all times when the vehicle is in motion.
- Adjust seat and mirrors before starting vehicle.
- Allow a 15 second warm up time.
- Check for warning lights.

DRIVING

- Do not drive if drowsy.
- Think ahead - anticipate hazards.
- Don't trust the other driver to drive properly.
- Don't speed or tailgate.
- Drive slower in hazardous conditions or hazardous areas.
- Pass only in safe areas and when excessive speed is not required.
- No loose articles on floor.
- Do not read, write, apply make-up, drink, eat or use a handheld cell phone while driving.
- Stay at least four seconds behind the vehicle ahead.
- Do not stop for hitchhikers or to provide roadside assistance.

- All employees are expected to follow all traffic laws and rules of the road while on company business
- Employees are strictly prohibited from operating a motor vehicle while under the influence of drugs or alcohol. This includes:
    - a) blood alcohol level at or above the local legal limit;
    - b) illegal drugs; and
    - c) prescription medications that cause drowsiness or other conditions that may cause impairment.
- Drivers must perform pull-through parking (pulling through a space, so the vehicle is facing outwards in the next space) when available, or backing into a parking space if necessary. This provides the operator an easier exit from the parking area as well as a quick exit in case of an emergency. When backing, it is recommended that a spotter be stationed outside the vehicle to ensure the driver backs safely, whenever practicable.

BACKING

- Back slowly and be ready to stop.
- Do not back up if anyone is in path of vehicle travel.
- Check clearances.
- Don't assume people see you.
- Getting out and check if you cannot see from the driver's seat.

STOPPING

- Park only in proper areas, not roadsides.
- Use warning flashers and raise hood if vehicle becomes disabled.

CARGO

The company and any employees operating company vehicles will secure any cargo on or in motor vehicles to ensure that it is adequately stored and secured to prevent unintentional movement of the equipment which could cause spillage, damage to the vehicle, or injury to the operator.

Applicable/Placards

OSHA is hereby issuing a final rule that requires employers who receive a package, transport vehicle, freight container, motor vehicle or rail freight car which contains a hazardous material and which is required to be marked, placarded, or labeled in accordance with jurisdictional requirements and the U.S. Department of Transportation's (DOT) Hazardous Materials Regulations, to retain the markings, placards, and labels on the package, transport vehicle, freight container, motor vehicle or rail freight car.

This rule is issued pursuant to section 6(b) of the Occupational Safety and Health Act of 1970 (the Act) and in accordance with section 29 of Public Law 101-615, the Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTUSA).

Hazardous Material Record Handling

A consignor must be able to produce a copy of any shipping document for two years after the date the shipping document or an electronic copy of it was prepared or given to a carrier by the consignor, for hazardous materials imported into the US, for two years after the date the consignor ensured that the carrier, on entry into the US, had a shipping document or was given an electronic copy of one, and within 15 days after the day on which the consignor receives a written request from an inspector.

Hazardous Material Training

The Hazardous Materials Transportation Officer shall provide access to an approved training program for employees, who during the course of employment, directly affect hazardous materials transportation, to include:

- Loads, unloads, or handles hazardous materials onto or from vehicles that enter highway commerce;
- Tests, reconditions, repairs, modifies, marks, or otherwise represents containers, drums, or packaging as qualified for use in the transportation of hazardous materials;
- Prepares hazardous materials for transportation offsite;
- Prepares shipping documents for hazardous material shipments; or
- Operates a vehicle used to transport hazardous materials off site.

CRASH REPORTING AND INVESTIGATION

Establish and enforce a crash reporting and investigation process. All crashes, regardless of severity, should be reported to the employee's supervisor as soon as feasible after the incident. Company traffic safety policies and procedures should clearly guide drivers through their responsibilities in a crash situation. All crashes should be reviewed to determine their cause and whether or not the incidents were preventable. Understanding the root causes of crashes and why they are happening, regardless of fault, forms the basis for eliminating them in the future.

Authorized drivers will report any collision or traffic violation while driving on company duties to the appropriate personnel.

- **Do not admit responsibility.**
- **Notify your company and law enforcement as soon as possible.**
- **Cooperate with any law enforcement officers.**
- **Move the vehicle only at the direction of a law enforcement officer.**
- **Fill out all sections of the accident report in the glove box.**
- **Do not sign any forms** unless required by a law enforcement officer.

- At the scene get the following information:
  - Investigating officer name and law enforcement agency;
  - Make, Model and License Plate number of other vehicles;
  - Names, addresses, and phone numbers of all witnesses;
  - Name, address, and license of other driver(s);
  - Photos of accident using camera in glove box of:
    - All 4 sides of all vehicles,
    - Roads and intersection at the scene,
    - Interior of all vehicles - seating and floor areas.

COMMERCIAL DRIVER LICENSE (CDL) REGULATIONS

CDL Medical Card

All commercial drivers of vehicles in interstate commerce with a maximum gross vehicle weight rating of over 10,000 pounds (4,536 kilograms) are required to obtain and maintain a valid Medical Examiner's Certificate (ME Certificate) Commercial drivers who drive vehicles requiring a CDL have two additional requirements.

All CDL holders must declare to their State Driver Licensing Agency (SDLA) that they only operate or expect to operate commercially in 1 of 4 possible categories with their CDL. This process is called self-certification.

Endorsements

Individuals may apply for an endorsement to be placed on their driver license.
Depending on the type of endorsement, an individual may be required to provide additional information, complete a separate application, or pass a knowledge test specific to the type of endorsement the individual is seeking.

The types of endorsements an individual can apply for are listed below:

- H – Authorizes the transportation of hazardous materials (CDL only)
- N – Authorizes the operation of a tank vehicle (CDL or CLP only)
- P – Authorizes the operation of a vehicle transporting passengers (CDL or CLP only)
- S – Authorizes the operation of a school bus (CDL or CLP only)
- T – Authorizes towing two (double)or three (triple) trailers over a specific weight
- X – Authorizes the operation of a combination of hazardous material and tank vehicle (CDL only)

VEHICLE INSPECTIONS

Driver Inspections

Prior to each first daily use and at the end of each use, the driver shall inspect the vehicle for proper operation of the following safety features, as applicable:

- ✓ Horn

- ✓ Backup warning
- ✓ Head, tail and signal lights
- ✓ Windshield wipers
- ✓ Tire inflation (visual check)
- ✓ Brakes
- ✓ Steering control
- ✓ Mirrors
- ✓ No operational warning lights
- ✓ Accident kit in glove compartment
- ✓ Fire extinguisher (light trucks and vans)
- ✓ Broken glass

Mechanical Inspections
Every company vehicle will be inspected by a qualified vehicle mechanics at least every 3 months. Vehicles shall be maintained in safe working order. Inspection and maintenance points include:

- ✓ Road test
- ✓ Visual inspection of brake system - wheel removal required
- ✓ Fluid system levels and visual inspection
- ✓ Brake pad wear
- ✓ Belts and hoses
- ✓ Battery condition
- ✓ Filter replacement
- ✓ Lubrication
- ✓ Oil change
- ✓ Emissions systems visual inspection
- ✓ Tire tread

Maintenance records of company owned vehicles shall be maintained by The Company.

PROGRESSIVE DISCIPLINARY ACTIONS

Disciplinary action is typically taken in stages. A first offense may constitute a verbal warning, the second offense may be a written warning, and a third offense may result in suspension or termination. Some violations may be considered grounds for immediate suspension or termination. Examples of infractions that may result in immediate suspension or termination include acts of violence and/or harassment against a coworker, failure to follow critical life safety procedures (such as completion of a safe work permit or failure to use fall protection), possession of weapons, use of drugs or alcohol, etc.

Each violation shall be investigated by management to ensure that an accurate and factual assessment of the infraction is documented. Corrective actions taken are meant to be corrective rather than punitive and shall be appropriate to each offense.

In the case of an infraction or when unacceptable behavior is witnessed or reported, the following shall occur:

Step 1 (1st Offense): The immediate supervisor shall **meet in person with the employee to** bring attention to the violation, conduct or performance/attendance issue.
The supervisor shall discuss the nature of the violation with the employee. The supervisor shall clearly describe expectations and steps the employee must take in order to improve or correct the problem.

Step 2 (2nd Offense): The second offense, violation or unacceptable behavior will result in a **written warning.** The process of step 2 includes a formal documentation of the offense, and shall include a description of the offense, the consequences of the current violation as well as the consequences that the employee may incur if a third offense occurs. The immediate supervisor and one witness, of equal or higher authority within The Company, shall be present for the presentation of this incident form, meeting and documentations process.

A performance improvement plan may be set forth at the sole discretion of The Company.

Step 3 (3rd Offense): Final written warning, suspension or termination may occur at this step, based upon the nature of the offense and the details of the performance improvement plan described in Step 3.

Step 4 (4th Offense): Termination.

FATIGUE MANAGEMENT

When driving long distances, sufficient breaks should be taken to prevent fatigue. When driving alone and having trouble staying awake, pull off the road and get out of the vehicle for fresh air, or take a power nap. If driving late at night, consider getting a hotel room and starting fresh the next day. If two licensed drivers are in the vehicle, take turns driving. Get plenty of rest before beginning your journey.

Drowsy Driving

As a driver, your number one responsibility is to get yourself and your passengers to your destination safely. When behind the wheel, you always need to be alert and focused. At 55 mph, a vehicle travels the length of a football field in 3.7 seconds. This is no time for a "mini" snooze. Being an attentive driver, and looking out for the driver who isn't, is increasingly important. Drive focused. Stay safe.

Safety Facts for the Road

Drowsy driving causes more than 100,000 crashes each year, resulting in 40,000 injuries and 1,550 deaths. Crashes caused by drowsy driving are often serious crashes and occur most often on high-speed rural highways when the driver is alone.

Drowsy driving can happen to anyone. A recent National Sleep Foundation study revealed that one half (51%) of adults have driven while drowsy and 17% report having fallen asleep while driving within the past year.

Drive Focused, Stay Safe and Avoid Aggressive Driving:

- Be aware of your behavior and the behavior of others on the road during the late night, early morning and mid-afternoon hours when drowsy driving crashes are most likely to occur. Plan a rest stop during these hours.
- Get a full night of rest before driving. If you become tired while driving, stop. A short nap (15 to 45 minutes) and consuming caffeine can help temporarily.
- Stop at regular intervals when driving long distances. Get out of the car every 2 hours to stretch and walk briskly.
- Set a realistic goal for the number of miles you can safely drive each day.
- Avoid taking medications that cause drowsiness.

CO_2 EMISSION REDUCTION

Listed below are just some of the steps The Company is taking to trying to reduce CO_2 emission output:

Carpooling

Employees carpooling to worksites drastically reduces CO_2 emissions. Less Company vehicles unnecessarily being used, less fuel consumption, less emissions, less pollution to the environment.

Driving Efficiently

Speeding, rapid acceleration and unnecessary breaking can increase the carbon output. Company drivers can reduce emission by going easy on the gas pedal and breaks.

Reducing Idle Time

When leaving Company vehicles idling, the vehicle is emitting carbon dioxide for no reason. Unnecessary idling of Company vehicles pollutes the air, wastes fuel and causes excess engine wear.

Maintenance

Getting regular tune-ups, follow the manufacturer's maintenance schedule, and using the recommended motor oil for Company vehicles can increase fuel efficiency.

Hours of Service Regulations	
Property Carrying Drivers	**Passenger Carrying Drivers**
11-Hour Driving Limit May drive a maximum of 11 hours after 10 consecutive hours off duty.	**10-Hour Driving Limit** May drive a maximum of 10 hours after 8 consecutive hours off duty.
14-Hour Limit May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.	**15-Hour Limit** May not drive after having been on duty for 15 hours, following 8 consecutive hours off duty. Off-duty time is not included in the 15-hour period.
30-Minute Driving Break Drivers must take a 30-minute break when they have driven for a period of 8 cumulative hours without at least a 30-minute interruption. The break may be satisfied by any non-driving period of 30 consecutive minutes (i.e., on-duty not driving, off-duty, sleeper berth, or any combination of these taken consecutively).	
60/70-Hour Limit May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.	**60/70-Hour Limit** May not drive after 60/70 hours on duty in 7/8 consecutive days.
Sleeper Berth Provision Drivers may split their required 10-hour off-duty period, as long as one off-duty period (whether in or out of the sleeper berth) is at least 2 hours long and the other involves at least 7 consecutive hours spent in the sleeper berth. All sleeper berth pairings MUST add up to at least 10 hours. When used together, neither time period counts against the maximum 14- hour driving window.	**Sleeper Berth Provision** Drivers using a sleeper berth must take at least 8 hours in the sleeper berth, and may split the sleeper berth time into two periods provided neither is less than 2 hours. All sleeper berth pairings MUST add up to at least 10 hours.
Adverse Driving Conditions Drivers are allowed to extend the 11-hour maximum driving limit and 14-hour driving window by up to 2 hours when adverse driving conditions are encountered.	**Adverse Driving Conditions** Drivers are allowed to extend the 10-hour maximum driving time and 15-hour on-duty limit by up to 2 hours when adverse driving conditions are encountered.

Short-Haul Exception A driver is exempt from the requirements of §395.8 and §395.11 if: the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in §395.1(e)(1) must report and return to the normal work reporting location within 14 consecutive hours, and stay within a 150 air-mile radius of the work reporting location.	**Short-Haul Exception** A driver is exempt from the requirements of §395.8 and §395.11 if: the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in §395.1(e)(1) must report and return to the normal work reporting location within 14 consecutive hours, and stay within a 150 air-mile radius of the work reporting location.

Electrical Safety

PURPOSE

The purpose of this Electrical Safety Policy is to outline the safe use of electrical equipment, including tools and appliances at **Pacific Northwest Towers;** hereafter referred to as "The Company."

The goal of this policy is to prevent electrically related injuries and property damage. Since electricity and electrical related injuries and deaths are a reality, this program shall be followed at all times by all personnel except when to do so would place themselves or others in harm's way.

RESPONSIBILITIES

Safety Coordinator

- To ensure that this Electrical Safety Policy is enforced.
- Shall ensure that provisions and procedures are in place for the protection of employees from external hazards including but not limited to pedestrians, vehicles and other barriers and by use of the pre-entry checklist verifying that conditions in the permit space are acceptable for entry during its duration.

Supervisor/Foreman

- Shall provide training for qualified and non-qualified employees
- Shall conduct inspections to identify electrical safety deficiencies
- Guard and correct all electrical deficiencies as soon as reasonably possible
- Shall ensure that all new electrical installations meet codes and regulations

Personnel

- Shall report electrical deficiencies as soon as reasonably possible
- Shall not work on electrical equipment unless authorized and trained
- Properly inspect all electrical equipment prior to use

POLICY

Safe work practices must be followed by all personnel of The Company to prevent electric shock or other injuries resulting from direct or indirect electrical contact, when work is performed near or on equipment or circuits which are or may be energized. Specific safe work practices shall be consistent with the nature and extent of the associated electrical hazards. The content of this Electrical Safety Policy set forth in accordance with OSHA Subpart S (electrical) 29 CFR 1910.331 through 29 CFR 1910.335.

This program covers the service and maintenance of all machines and equipment which have not been placed in an electrically safe working condition and the installation and or removal of main disconnect switches on bus ducts. Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged shall be treated as energized (live) parts.

Any machine or equipment which has not been shut down per our lockout tagout procedures will **not** be considered to be electrically safe.

REQUIREMENTS FOR SAFETY RELATED POSITIONS

- Employees who face a risk of electric shock but who are not qualified persons shall be trained and familiar with electrically related safety practices.
- Employees shall be trained in safety related work practices that pertain to their respective job assignments.
- Employees will be trained on safe Clearance Distances.

The provisions of these procedures cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed-energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

Premises Wiring - Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, parking, and other lots, and industrial substations.

Wiring for Connections to Supply - Installations of conductors that connect to the supply of electricity.

Other Wiring - Installations of other outside conductors on the premises.

Optical Fiber Cable - Installations of optical fiber cable where such installations are made along with electric conductors.

Bus Duct Switches - Installation and removal of Bus Duct Switches on energized busses.

Qualified Persons (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.

Safe work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts when work is performed near or on equipment or circuits which are or may be energized.

TRAINING

The training requirements contained in this document apply to employees who face a risk of shock that is not reduced to a safe level by the installation as required by the National Electrical Code and 29 CFR 1910 Subpart S, Electrical. Each affected employee must be trained prior to initial assignment, prior to a change in initial assignment duties, if a new hazard has been created or special deviations have occurred.

- Other employees who also may reasonably be expected to face comparable risk of injury due to electric shock or other electrical hazards must also be trained.
- Employees who are covered by the scope this policy, but who are not qualified persons shall also be trained in and familiar with any electrically related safety practices not specifically addressed but which are necessary for their safety.
- The training required shall be of the classroom or on-the-job type (preferably both). The degree of training provided shall be determined by the risk to the employee.
- Each affected employee must be trained prior to initial assignment, prior to a change in assigned duties, if new hazard has been created or special deviations have occurred.
- The training record shall include employee name, trainer signature/initials and dates of training. Training records must be made available to employees and their authorized representative(s).
- Electrical engineers, electronic technicians, electricians, mechanics and personnel who may perform maintenance and or repair type tasks.

Safe work practices must be used when necessary to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

DE-ENERGIZED PARTS

Live parts to which an employee may be exposed shall be de-energized before the employee works on or near them, unless the employer can demonstrate that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be de-energized if there will not be increased exposure to electrical burns or to explosion due to electric arcs.

ENERGIZED PARTS

If the exposed live parts are not de-energized, (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. When working on energized parts, the appropriate PPE shall be used.

❖ Note: An electrical work permit is completed before energized work begins.

While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements in the following order.

- Procedures shall be in place before equipment may be de-energized.
- Circuits and equipment to be worked on shall be disconnected from all electrical energy sources.
- Stored electrical energy, which poses a hazard to workers, shall be released.
- Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.
- A lock and a tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed, except as provided below.
- Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

A tag used without a lock as permitted above, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

A lock may be placed without a tag only under the following conditions:

- Only one circuit or piece of equipment is de-energized.
- The lockout period does not extend beyond the work shift.
- Employees exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure.

Before any circuits or equipment can be considered and worked as de-energized:

- A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized.

Before circuits and equipment are re-energized, even temporarily, the following requirements shall be met, in the order given:

- A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.
- Employees exposed to the hazards associated with re-energizing the circuit or equipment shall be warned to stay clear of circuits and equipment.
- Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if the employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that the employer ensures that the employee who applied the lock or tag is not available at the workplace and is aware that the lock or tag has been removed before he or she resumes work at that workplace.
- There shall be a visual determination that all employees are clear of the circuits and equipment.

This section applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

LIVE PARTS

Live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means in accordance with 1926.403(i)(2)(i):

- By location in a room, vault, or similar enclosure that is accessible only to qualified persons.
- By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.
- By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

WORKING LIVE NFPA 70E

OSHA mandates that all services to electrical equipment be done in a de-energized state. "Working live" can only be done under special circumstances. NFPA 70E defines those special circumstances and sets rigid electrical safety limits on voltage exposures, work zone boundary requirements and necessary personal protective equipment (PPE). (See NFPA 70E-2018 Article 130 and OSHA subpart S part 1910.333(a)(1) for complete details.)

ILLUMINATION

Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

- Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts.

CONDUCTIVE MATERIALS AND EQUIPMENT

Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts or pipes) in areas with live parts, the hazard must be minimized by the use of insulation, guarding, or material handling techniques.

- Non-conductive fish tapes must be used when pulling wire through conduit that contains energized conductors or when entering an enclosure with exposed live parts.

PORTABLE LADDERS

Portable ladders shall be at the non-conductive type (wood or fiberglass) if they are used where the employee or the ladder could contact exposed energized parts.

- In addition, all portable ladders shall have non-conductive side rails.

CONDUCTIVE APPAREL

Conductive articles of jewelry and clothing (such as bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts, unless they are rendered non-conductive by covering, wrapping, or other insulating means.

HOUSEKEEPING DUTIES

Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

- Electrically conductive cleaning materials may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

INTERLOCKS

Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

CONFINED OR ENCLOSED WORK SPACES

When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

SUFFICIENT ACCESS TO WORKING SPACES

Program shall state that sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment. 1926.403(i)(1)

Clear Spaces

Working space required by this subpart shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

OVERHEAD LINES

Employees shall not work on, or near (within 12 feet) overhead lines. This 12-foot barrier includes any conductive object in that space. OSHA provides specific instructions regarding work on overhead lines. Refer to Subpart S – Electrical 29 CFR 1910.333(c) (3) for more detail.

- When possible, power lines shall be de-energized and grounded or other protective measures shall be provided before work is started.
- Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage.

BUS DUCT SWITCHES

For the purposes of installing or removing main disconnect switch on energized bus ducts, only designated persons are allowed to plug or unplug bus switches (see Maintenance Manager for approved electricians).

Employees installing or removing switches on energized bus ducts shall use the following PPE during the steps noted:

- Rubber gloves with leather protectors.
- Full face shield.
- Welding jacket.

Switch installation procedures:

- Remove fuses and place switch in off position.
- Install switch per manufacturer's instructions (PPE required).
- Lock and tag switch in off position.
- Connect load - verify safety of load circuit by checking resistance between phases and between phases to ground.
- Install fuses.
- Manually actuate switch to on position from floor using hot stick - DO NOT actuate switch from scissors lift or ladder.
- PPE must be worn when performing switch installation.

Switch removal procedures:

- Manually actuate switch to off position from floor using hot stick - DO NOT actuate switch from scissors lift or ladder.
- Lock and tag switch.
- Verify that there is no Voltage present on the switch.
- Remove fuses.
- Disconnect load - remove associated wiring and conduit.
- Remove switch from bus duct (PPE required).

PORTABLE ELECTRIC EQUIPMENT

This section applies to the use of cord and plug connected equipment, including flexible cord sets (extension cords).

Extension Cord Use

- Employees using extension cords (drop cords) to power tools and/or equipment for the performance of construction, maintenance, repair or demolition shall use GFCI protection. This pertains to any part of the plant, both inside and outside.
- All extension cords must be grounding type, made with UL listed parts, and be in good physical condition.

- Extension cords may not be lengthened, or "repaired" with tape.
- Power outlet strips are for equipment needing surge protection (e.g., computers).
- Extension cords shall not be run through holes in walls, ceilings or floors.
- Extension cords may not be plugged into power strips. Power strips may not be connected to each other (i.e., "piggy-backed").
- An extension cord should not be run across high traffic areas or used in applications where potential damage to the cord might occur.
- The use of an extension cord must not create a trip hazard.
- Extension cords shall not be attached to building surfaces or used in lieu of fixed wiring of a structure.
- Extension cords shall not be run through doorways or windows, or concealed behind walls, ceilings or floors.

Handling
Portable equipment shall be handled in a manner, which will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

Visual Inspection
Portable cord-and-plug connected equipment and flexible cord sets (extension cords) shall be visually inspected before use on any shift for external defects and for evidence of possible internal damage. Cord and plug-connected equipment and extension cords which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

Defective or damaged items shall be removed from service until repaired.

GROUNDING TYPE EQUIPMENT

A flexible cord used with grounding-type equipment shall contain an equipment-grounding conductor.

- Attachment plugs and receptacles may not be connected or altered in a manner which would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.
- Adapters (i.e., "cheaters") that interrupt the continuity of the equipment grounding connection may not be used.

Conductive Work Locations

Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, shall be approved for those locations.

Connecting Attachment Plugs

Employees' hands may not be wet when plugging and unplugging flexible cords and cord and plug-connected equipment, if energized equipment is involved.

- Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand.
- Locking-type connectors shall be properly secured after connection.

APPROVAL AND EXAMINATION

All electrical conductors and equipment shall be approved. The Company shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees 1926.403(b)(1). Safety of equipment shall be determined on the basis of the following considerations:

- Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.
- Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided. 1926.403(a)

MARKING

Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

ELECTRIC POWER AND LIGHTING CIRCUITS

Routine Opening and Closing of Circuits

Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or dosing of circuits under load conditions. Cable connector's not of the load-break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

Re-closing Circuits After Protective Device Operation

After a circuit is de-energized by a circuit protective device, the circuit may not be manually re-energized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual re-closing of circuit breakers or re-energizing circuits through replaced fuses is prohibited.

***Note**: Circuit breakers or fuses can only be energized after an overload condition has been determined. If a fault condition exists, the circuit must be tested and determined safe before the circuit can be energized Circuit breakers can be reset, however repetitive reclosing is prohibited. The problem should be traced to the root cause if a circuit breaker trips twice in succession.

OVERCURRENT PROTECTION MODIFICATION

Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed in the installation safety requirements for overcurrent protection.

TEST INSTRUMENTS AND EQUIPMENT

Only qualified persons may perform testing work on electric circuits or equipment that have not been de-energized. Such persons shall be made familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools.

Visual Inspection

Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.

Rating of Equipment

Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

OCCASIONAL USE OF IGNITABLE AND FLAMMABLE MATERIALS

Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing.

SAFE GUARD FOR PERSONNEL AND EQUIPMENT

Personal Protection Equipment

Employees working in areas where there are potential electrical hazards shall be provided with, and shall use, electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed.

- Protective equipment shall be maintained in a safe, reliable condition and shall be periodically inspected or tested, as required by 29 CFR 1910.137.
- If the insulating capability of protective equipment may be subject to damage during use, the insulating material shall be protected. (For example, an outer covering of leather is sometimes used for the protection of rubber insulating material.)
- Employees shall wear non-conductive head protection wherever there is a danger of head injury from electric shock or bums due to contact with exposed energized parts.
- Employees shall wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electric arcs or flashes or from flying objects resulting from electrical explosion.

When working near exposed energized conductors or circuit parts, each employee shall use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material shall be protected.

- Fuse handling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the fuse terminals are energized.
- Ropes and hand lines used near exposed energized parts shall be nonconductive.
- Protective shields, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect unqualified persons from contact with live parts.
- Protective shields, protective barriers or insulating materials as necessary shall be provided.

Cabinet doors and electrical enclosures should be kept closed. If, however, this is not possible due to the conditions which follow, additional precautions must be taken to minimize the extent of the hazard.

This section covers situations where:

- Energized equipment is exposed and must be left unattended.
- The scope of the energized equipment is so large that the person working cannot monitor it.

- The equipment cannot otherwise be guarded against accidental intrusion by a passerby.

ALERTING TECHNIQUES

The following alerting techniques shall be used to warn and protect employees from hazards which could cause injury due to electric shock, burns, or failure of electric equipment parts:

- **Safety signs, safety symbols, or accident prevention tags** shall be used where necessary to worn employees about electrical hazards, which may endanger them, as required.
- **Barricades** shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.
- **Attendants -** If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect

All safety-related work practices shall be employed to prevent electric shock or electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. Live parts shall be de-energized before the employee works on them unless it can be established that de-energizing introduces additional or increased hazards or is not feasible due to design of equipment or operational limitations. If exposed live parts are not de-energized for the above reasons, other safety practices shall be used to protect employees.

WORKING ON OR NEAR EXPOSED DE-ENERGIZED PARTS

Application

This applies to work on exposed de-energized parts or near enough to them to expose employees to any electrical hazard present. Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged shall be treated as energized.

LOCKOUT AND TAGGING

While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits shall be locked out or tagged or both.

Note: Lockout and tagging that comply with paragraphs (c) through (f) of 1910.147 (Lockout & Tagging Standard) will comply with these requirements provided:

- The procedures address electrical hazards;
- Stored non-electrical energy that could re-energize electrical circuits shall be effectively blocked or relieved;

- A qualified person shall use test equipment (volt-ohm meter, etc.) and shall verify that the circuit and equipment are de-energized. If the circuit is over 600 volts, the test equipment shall be checked for proper operation immediately before and immediately after this test.

PROCEDURES

These written procedures shall be available for inspection by employees and by the Commissioner of Labor or authorized representatives.

DE-ENERGIZING EQUIPMENT

Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment are de-energized. The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks may not be used as the sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

- Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.
- Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved so that the circuit parts could not be accidentally energized.

APPLICATION OF LOCKS AND TAGS

A lock and a tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed, except as provided below:

- The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools, (bolt cutter, etc.).
- Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
- If a lock cannot be applied, or tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.
- A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of a fuse, blocking a controlling switch, or opening an extra disconnect.
- A lock may be placed without a tag only under the following conditions:
  - Only one circuit or piece of equipment is de-energizing, and
  - The lockout period does not extend beyond the work shift, and

- Employees exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure.

Verification of De-energizing Condition

These requirements shall be met before any circuits or equipment can be worked as de-energizing.

- A qualified person shall operate the equipment controls or otherwise verify that the equipment cannot be restarted.
- A qualified person shall use test equipment (volt-ohm meter, etc.) to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, the test equipment shall be checked for proper operation immediately before and immediately after this test.

Re-energizing Equipment

These requirements shall be met, in the order given, before circuits or equipment are re-energized, even temporarily.

- A qualified person shall conduct tests and visual inspections to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safety energized.
- Employees exposed to the hazards of re-energizing the circuit or equipment shall be warned to stay clear of circuits and equipment.
- Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:
- The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
- The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.
- There shall be a visual determination that all employees are clear of all circuits and equipment.

Minimum approach distance to energized high power voltages lines for unqualified employees is 10 feet.

Minimum approach distance for qualified employees shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified – Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Employees – Alternating Current. Approach distances are 10' for 50kV plus 4" for every additional 10k.

Qualified Employees MUST ADHERE to the approach distances set forth in table S5 of CFR 1910.333 (below).

Voltage Rage (phase to phase)	Minimum Approach Distance
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm)
Over 750V, not over 2kV	1 ft. 6 in. (46 cm)
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm)
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm)
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm)
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm)
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm)

When a qualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- For voltages to ground 50kV or below 10 feet (305 cm)
- For voltages to ground over 50kV 10 feet (305 cm)
- 4 inches (10 cm) for every 10kV over 50kV.

Fall Protection and Falling Object Prevention/Protection

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding fall protection for **Pacific Northwest Towers;** hereafter referred to as "The Company."

The hazards of potential falls at heights of 4 feet and above will be addressed in this document. This instruction describes a systematic approach that must be used to protect and prevent people from falling. This instruction also lists some of the most common fall hazards and provides recommendations and guidelines for selecting fall arrest systems.

OSHA 1926.500-503, 1926.502(j)

RESPONSIBILITIES

Many workers are injured or killed from falls each year, and it is the policy of The Company to provide a healthy work environment for its employees. Therefore, The Company management commits the necessary resources and time to ensure that all persons on worksites are protected from injury and illness hazards. Management staff at The Company, including the executive team, will lead in the design, implementation and continuous monitoring and improvement of the site's safety and health activities.

The Company Safety Officer is **Joaquin Blas** This person is responsible for the administration of this program and has full authority to make necessary decisions to ensure success of the program. All company employees are responsible for safety at all times. The Company has expressly authorized this person to halt any company operation where there is danger of serious personal injury.

The fall protection plan shall be prepared by a qualified person for the specified work site.

Management shall perform annual reviews of this safety policy and any corresponding training programs/records to ensure that all workers are trained in the awareness and avoidance of unsafe acts and situations surrounding the use and or exposure of fall protection.

Contractor Responsibilities

In addition to complying with the fall protection requirements that apply to all company employees, each contractor who is retained to perform operations that involve fall protection will:

- Obtain any available information regarding fall hazards and protective measures from The Company.

- Coordinate fall protection operations with The Company, when both company personnel and contractor personnel will be working in or near recognized fall hazard locations.
- Inform The Company of the fall protection program that the contractor will follow and of any hazards confronted or created in conducting operations involving fall protection within company owned facilities through a debriefing immediately prior to the operation.

It will remain the duty of The Company's active management team to ensure that all fall prevention equipment is properly maintained and used by trained personnel.

Employees and personnel of The Company, including part-time and temporary labor, shall follow this written health and safety policy to ensure a safe work environment for all.

Competent Person – One who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous or dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them.

POLICY

Fall protection is required whenever employees are potentially exposed to falls from heights that exceed applicable regulatory thresholds. Guard rails, safety nets, or personal or fall arrest systems should be used.

The Company employees will adhere to the fall protection standards set for below depending upon which job function they are performing:

General Industry 1910.23(b) - Protection for wall openings and holes. Every wall opening from which there is a drop of more than 6 feet shall be guarded.

Construction Industry 1926.501(b)(1) - Unprotected sides and edges. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

Marine Terminals 1917.112(b)(1) - Guardrails shall be provided at locations where employees are exposed to floor or wall openings or waterside edges, including bridges or gangway-like structures leading to pilings or vessel mooring or berthing installations, which present a hazard of falling more than 4 feet (1.22 m) or into the water.

Shipyard Industry 1915.73(d) - When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges shall be guarded by adequate guardrails.

Steel Erection 1926.760(a)(1) - Each employee engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet (4.6 m) above a lower level shall be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

*The fall protection plan shall be prepared by a qualified person for each specific work site.

When conventional fall protection is not used these locations will be identified and classified as controlled access zones.

A Competent Person will be assigned to:

- Recognize fall hazards
- Warn employees if they are unaware of a fall hazard or is acting in an unsafe manner
- Be on same working surface and in visual sight
- Stay close enough for verbal communication
- Not have other assignments that would take monitor' s attention from the monitoring function

All accidents and serious incidents (near miss) shall be investigated, implementing changes to the fall protection plan as necessary.

When purchasing equipment and raw material for use in fall protection systems applicable OSHA, ANSI and ASTM requirements will be met.

The Company will provide for prompt rescue of employees in the event of a fall or shall assure the employees - are able to rescue themselves.

The workplace shall be assessed before each assigned job for potential fall hazards. Proper fall arrest equipment will be used for jobs requiring fall protection when elimination of the hazard(s) is not possible. The Company will evaluate the facilities by department to determine fall hazards. This preliminary evaluation will detail the required steps for protecting employees from fall hazards.

TRAINING

The Company shall provide a training program for each employee who may be exposed to fall hazards, or who may have the likelihood of exposure to this risk.

Training shall enable each employee to recognize the hazards of falling and shall train each employee in the procedure to follow to minimize all associated falling hazards.

The Company will have written certification records showing the following:

- Who was trained, when, dates of training?
- Signature of person providing training and dates employer determined training was deemed adequate.

The Company will provide re-training when the following are noted, occur or observed:

- Deficiencies in training
- Workplace changes
- Fall protection systems or equipment changes that render previous training obsolete

CLIENT REQUIREMENT

A training program shall be provided for all employees who will be exposed to fall hazards in the work area and will be conducted by competent personnel. The program will include but will not be limited to:

- A description of fall hazards in the work area
- Procedures for using fall prevention and protection systems
- Equipment limitations
- The elements encompassed in total fall distance
- Inspection and storage procedures for the equipment

Generally, workers will be trained to recognize the hazards of falling from elevations and to avoid falls from grade level to lower levels through holes or openings in walking/working surfaces. Training programs will include prevention, control and fall arrest systems. It must be ensured that appropriate fall arrest systems are installed, and that employees know how to use them before beginning any work that requires fall protection.

INITIAL TRAINING

Training will be conducted prior to job assignment. The Company will provide training to ensure that the purpose, function, and proper use of fall protection is understood by employees and that the knowledge and skills required for the safe application and usage is acquired by employees. This standard practice instruction will be provided to and read by all employees receiving training. The training will include, as a minimum the following:

- Types of fall protection equipment appropriate for use.
- Recognition of applicable fall hazards associated with the work to be completed and the locations of such.
- Load determination and balancing requirements.
- Procedures for removal of protection devices from service for repair or replacement.
- All other employees whose work operations are or may be in an area where protection devices fall may be utilized, will be instructed to an awareness level concerning hazards associated with fall protection operations.

- Fall protection equipment identification. Fall protection equipment having identification numbers will be checked for legibility. Fall protection equipment having illegible identification markings will be turned in to the supervisor for inspection.
- Equipment maintenance and inspection requirements.
- Equipment donning and doffing procedures.
- Equipment strengths and limitations.

CERTIFICATION TRAINING

The Company will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

REFRESHER TRAINING

This standard practice instruction will be provided to and read by all employees receiving refresher training. The training content will be identical to initial training. Refresher training will be conducted on a semi-annual basis or when the following conditions are met, whichever event occurs sooner.

Retraining will be provided for all authorized and affected employees whenever (and prior to) a change in their job assignments, a change in the type of fall protection equipment used, or when a known hazard is added to the work environment which affects the fall protection program.

Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in The Company's knowledge or use of fall protection equipment or procedures.

Whenever a fall protection procedure fails. The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

Certification

The Company will certify that employee training has been accomplished and being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

FALL PREVENTION

Control Procedures Development. Once a facility evaluation has been accomplished, procedures will be developed, documented and utilized for the control of potential fall hazards. Fall prevention plans will be designed by company competent individuals or other competent personnel. Company engineers (where utilized) or other competent personnel will be provided

with any required specialized training to recognize fall hazards, to understand and address fall prevention techniques, and to become familiar with fall arrest equipment and procedures. It is critical that they consider fall protection design for the safety of operations where employees must work at elevated heights. Safety during access and egress from elevated work sites will also be considered. The following guidelines will be used when planning work at elevated heights:

- Involve the Safety Department early in the project planning/job planning so that they can recommend appropriate fall-protection measures and equipment.
- Involve qualified Engineers when load rating of anchorage points must be determined or is in doubt. Required training will be provided as necessary.
- Involve Engineering and Maintenance when anchorage points must be installed.
- The Company and Engineering Departments will use the expertise of fall protection equipment manufacturers such as Rose Manufacturing Company., Miller Equipment Company, Research and Trading Company and DBI/SALA.
- The Company will be specific in dealing with fall hazards when developing contracts.

CONTROLLED ACCESS ZONES

If Fall Protection Plans are utilized, the following requirements need to be met:

- Where no other alternate methods have been implemented, a safety monitoring system will be implemented.
- When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.
    - When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting precast concrete members.
    - When erecting precast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.
    - The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
    - The control line shall be connected on each side to a guardrail system or wall.
- When used to control access to areas where overhand bricklaying and related work are taking place:
    - The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.
    - The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.
    - Additional control lines shall be erected at each end to enclose the controlled access zone.

  - Only employees engaged in overhand bricklaying or related work shall be permitted in the controlled access zone.
- Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
  - Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
  - Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) [50 inches (1.3 m) when overhand bricklaying operations are being performed] from the walking/working surface.
  - Each line shall have a minimum breaking strength of 200 pounds (.88 kN).
- On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones shall be enlarged, as necessary, to enclose all points of access, material handling areas, and storage areas.
- On floors and roofs where guardrail systems are in place but need to be removed to allow overhand bricklaying work or leading-edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

The Company will ensure methods are used to identify employees working in controlled access zones (i.e., color coded helmets, arm band, or safety vests).

When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access. When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting precast concrete members.

When erecting precast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge. The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a guardrail system or wall.

When used to control access to areas where overhand bricklaying and related work are taking place:

- The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.

- The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.
- Control lines shall be erected at each end to enclose the controlled access zone.

Note: Only employees engaged in overhand bricklaying or related work shall be permitted in the controlled access zone.

Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

- Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
- Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) [50 inches (1.3 m) when overhand bricklaying operations are being performed] from the walking/working surface.
- Each line shall have a minimum breaking strength of 200 pounds (.88 kN)
- On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones shall be enlarged, as necessary, to enclose all points of access, material handling areas, and storage areas.

On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed

PROTECTIVE MATERIALS AND EQUIPMENT

Appropriate fall protection devices will be provided for potential fall hazards. Selection of the equipment will be based on the fall protection evaluation. Evaluations will be conducted by the personnel authorized to evaluate fall protection requirements.

Fall Protection devices will be singularly identified; will be the only devices(s) used for controlling falls; will not be used for other purposes; and will meet the following requirements:

- Capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- Anchor points will not deteriorate when located in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
- Capable of withstanding the ultimate load of 5,000 lbs. for the maximum period of time that exposure is expected.
- Standardization within company facilities. Fall protection devices will be standardized whenever possible.

FALL PROTECTION SYSTEMS

When fall hazards cannot be eliminated through any other means, fall arrest systems will be used to control falls. Proper training on the use of fall arrest equipment is essential and will be provided prior to use.

Full Body Harness Systems

A full body harness system consists of a full-body harness, lanyard, energy shock absorber, and self-locking snap hook. Before using a full-body harness system, the supervisor and/or the user must address such issues as:

- Has the user been trained to recognize fall hazards and to use fall arrest systems properly?
- Are all components of the system compatible according to the manufacturer's instructions?
- Have appropriate anchorage points and attachment techniques been reviewed?
- Has free fall distance been considered so that a worker will not strike a lower surface or object before the fall is arrested?
- Have swing fall hazards been eliminated?
- Have safe methods to retrieve fallen workers been planned?
- Has the full-body harness and all of its components been inspected both before each use and on a regular semi-annual basis?
- Is any of the equipment, including lanyards, connectors, and lifelines, subject to such problems as welding damage, chemical corrosion, or sandblasting operations?

RETRACTABLE LIFELINES

- A retractable lifeline is a fall arrest device used in conjunction with other components of a fall arrest system. Retractable lifelines should be used by one person at a time.
- A properly inspected and maintained retractable lifeline, when correctly installed and used as part of the fall arrest system, automatically stops a person's descent in a short distance after the onset of an accidental fall.
- Retractable lifelines may be considered when working in areas such as on roofs and scaffolds, or in tanks, towers, vessels, and manholes. Also, retractable lifelines should be considered when climbing such equipment as vertical fixed ladders. Before using a retractable lifeline, the supervisor and/or the user must address the following questions:
  - Has the user been trained to use a retractable lifeline correctly?
  - Is the retractable lifeline being used in conjunction with a complete fall arrest system?
  - Is the equipment under a regular maintenance program?
  - Has the equipment been inspected within the last six months?

STANDARD HARNESS

Harnesses for general purpose work should be Class III, constructed with a sliding back D-ring. Standard harnesses are suitable for continuous fall protection while climbing, riding, or working on elevated personnel platforms. They are suitable for positioning, fall arrest, and the rescue and evacuation of people who are working at elevated heights.

INSPECTION AND MAINTENANCE

To ensure that fall protection systems are ready and able to perform their required tasks, a program of inspection and maintenance will be implemented and maintained. The following as a minimum, will comprise the basic requirements of the inspection and maintenance program:

- Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.
- All fall protection equipment will be inspected prior to each use, and a documented inspection at intervals not to exceed 6 months, or in accordance with the manufacturer's guidelines.
- The Company Designated Competent Person will inspect equipment and check the inspection date before each usage.
- The user will inspect his/her equipment prior to each use for any signs of defects and the inspection date.
- Any fall protection equipment subjected to a fall or impact load will be removed from service immediately and inspected by a qualified person (sent back to the manufacturer).
- Check all equipment for mold, damage, wear, mildew, or distortion.
- Hardware should be free of cracks, sharp edges, or burns.
- Ensure that no straps are cut, broken, torn or scraped.
- Special situations such as radiation, electrical conductivity, and chemical effects will be considered.
- Equipment that is damaged or in need of maintenance will be tagged as unusable and **will not be stored** in the same area as serviceable equipment.
- A detailed inspection policy will be used for equipment stored for periods exceeding one month.
- Anchors and mountings will be inspected before each use by the user and supervisor for signs of damage.

Accident investigations shall be conducted to evaluate the fall protection plan for potential updates to practices, procedures or training in order to prevent reoccurrence.

Fall Arrest Systems

Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service. **1926.502(d)(21)**

MOST COMMON AND MOST DANGEROUS FALL HAZARDS

The tasks and situations listed below present inherent fall hazards. Give special attention to providing fall prevention and/or fall control for them, remembering that this attention is necessary in the design, engineering, planning, and execution stages of work. Supervisors will give special consideration to fall protection for the following tasks:

- Working from crane booms and tower cranes.
- Working on top of machinery and equipment, such as overhead cranes, furnaces, conveyors and presses.
- Other work that involves fall hazards, such as 'off-chutes' from main piping in duct work or boilers.
- Working on roofs, with deteriorating or unsupported sections and framing.
- Working over chemical tanks or open pits.
- Working from fixed or portable ladders or climbing systems.
- Performing work on water towers, product tanks, silos, pipe racks, presses, and floor pits.

SAFETY MONITORING SYSTEMS

The Company shall designate a competent person to monitor the safety of other employees and ensure that the safety monitor complies with the following requirements:

- The safety monitor shall be competent to recognize fall hazards;
- The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;
- The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee being monitored;
- The safety monitor shall be close enough to communicate orally with the employee; and
- The safety monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function. 1926.502(h)

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs. No employee, other than an employee engaged in roofing work [on low-sloped roofs] or an employee covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

Each employee working in a controlled access zone shall be directed to comply promptly with fall hazard warnings from safety monitors.

FALL PROTECTION PLAN

This option is available only to employees engaged in leading edge work, precast concrete erection work, or residential construction work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan must conform to the following provisions.

The fall protection plan shall be prepared by a qualified person and developed specifically for the site where the leading edge work, precast concrete work, or residential construction work is being performed and the plan must be maintained up to date. Any changes to the fall protection plan shall be approved by a qualified person.

The implementation of the fall protection plan shall be under the supervision of a competent person. The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety nets systems) are infeasible or why their use would create a greater hazard.

The fall protection plan must include a statement which provides the name or other method of identification for each employee who is designated to work in controlled access zones. No other employees may enter controlled access zones.

In the event an employee falls, or some other related, serious incident occurs, (e.g., a near miss) the employer shall investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g. new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents. 1926.502(k)

DEFINITIONS

Anchorage - A secure point of attachment for lifelines, lanyards or deceleration devices.

Body Belt - A strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body Harness - Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent Person - A person who is capable of identifying hazardous or dangerous conditions in any personal fall arrest system or any component thereof, as well as in their application and use with related equipment.

Connector - A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system.

Deceleration Device - Any mechanism with a maximum length of 3.5 feet, such as a rope grab, rip stitch lanyard, tearing or deforming lanyards, self-retracting lifelines, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Energy Shock Absorber - A device that limits shock-load forces on the body.

Failure - Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall Arrest System - A system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook.

Free Fall - Means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance - Means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hole - A gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Lanyard - Flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Leading Edge - The edge of a floor roof, or formwork for a floor or other walking/working surface which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline - A component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Opening - A gap or void 30 inches, or more, high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal Fall Arrest System - System used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Positioning Device System - Body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Qualified Person - Recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

Retractable Lifeline - A fall arrest device that allows free travel without slack rope but locks instantly when a fall begins.

Rope Grab - A deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety-Monitoring System - A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-Retracting Lifeline/Lanyard - A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snap Hook - A connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are generally one of two types:

- The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.

FALLING OBJECT PREVENTION/PROTECTION

Reference **OSHA 1926.502(J)**

Toe Board

A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

The Company will ensure that Toe-boards, when used as falling object protection, will be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

Any toe-board used by The Company must be capable of withstanding, without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toe-board.

Toe-boards shall be a minimum of 3 ½ inches (9cm) in vertical height from their top edge to the level of the walking/working surface. They shall have not more than 1/4 inch (0.6 cm) clearance above the walking/working surface. They shall be solid or have openings not over 1 inch (2.5 cm) in greatest dimension.

Guardrail Systems

Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.

During the performance of overhead bricklaying and related work:

No materials or equipment except masonry and mortar shall be stored within 4 feet (1.2m) of the working edge.

- Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear from the work area by removal at regular intervals, to prevent injury from falling objects.

During the performance of roofing work:

- Materials which are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.

Canopies

Canopies, when used as falling object protection, shall be strong enough to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

Walking/Working Surface
Any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning Line System
A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Fatigue Management

PURPOSE

The purpose of this document is to prevent illness and injury that may occur as a result of employee/worker fatigue while performing work on behalf of **Pacific Northwest Towers**; hereafter referred to as "The Company."

RESPONSIBILITIES

Safety Officer

- Establish a recordkeeping and monitoring process to ensure hours of work and operation do not exceed legal standards
- Ensure that all personnel are trained in the policy outlined in this chapter

Management

- Ensure compliance with this policy by all affected crew members, including temporary workers and contractors
- Ensure all workers take scheduled breaks as set forth in The Company Employee Handbook and HR policy
- Ensure that each employee is given additional rest breaks commensurate to the work being performed

Employees

- Follow this policy at all times
- Inform direct supervisor of any personal fatigue related conditions that may affect the safety of themselves or another worker

***All employees in safety critical positions shall report fatigue/tiredness and lack of mental acuity to supervision; as well as supervisory personnel to make safety critical decisions and take appropriate actions to prevent loss.**

GENERAL

Slow reaction to work conditions, failure to respond, poor logic and judgment, damage to property, and an increase in risk taking which may result in injury are potential results of fatigue in the work place. The Company will ensure as reasonably practicable that these conditions are not contributed to through increased pressures to complete a project or work assignment.

Long work hours and or extended consecutive days of work in conjunction with inadequate hours of rest are factors that may contribute to fatigue and cause injury.

TRAINING

Initial and annual training will be provided on how to recognize fatigue, how to control fatigue through appropriate work and personal habits, and reporting of fatigue to supervision.

ENGINEERING CONTROLS

Heat and cold stress, as well as the use of personal protective equipment, respirators and other work equipment are all factors that may increase fatigue and shall be taken into consideration when performing the daily job safety/hazard analysis.

The Company has set forth work hour limitations in the Employee HR Handbook in accordance with state and federal statutes. The Company will also control job rotation schedules to control fatigue, allow for sufficient sleep, and increase mental fitness in an effort to control employee turnover and absenteeism.

Ergonomic equipment will be used to improve workstation conditions such as anti-fatigue mats for standing, lift assist devices for repetitive lifting, proper lighting and control of temperature, and other ergonomic devices as deemed appropriate.

The Company will provide chairs for workers to sit periodically, and will provide periodic rest breaks for personnel to prevent fatigue.

Employees must not chronically use over-the-counter or prescription drugs to increase mental alertness. The Company discourages employees from taking any substance known to increase fatigue in that employee, including fatigue that sets in after the effects of the drug wear off.

EVALUATION/REVIEW

The Company will analyze and evaluate work tasks periodically in order to control fatigue.

Forklifts and Industrial Trucks

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding the use of Forklifts and Industrial Trucks for **Pacific Northwest Towers**; hereafter referred to as "The Company."

The Company and its employees may not operate forklift/industrial truck devices at every jobsite, however, all employees who work on or around forklift equipment, whether as the primary contractor or as a sub-contractor on any worksite, shall adhere to the following health and safety policy and procedure. This program applies to all powered industrial tucks, hoists and lifting gear.

RESPONSIBILITIES

Management

- Provide adequate training in safe operation of all equipment used to move or access materials
- Provide equipment that is safe to operate
- Implement an "Out of Service" program for damaged equipment
- Not allow modification to equipment except those authorized in writing by the equipment manufacturer
- Establish safe operating rules and procedures

Supervisors

- Monitor safe operations of material handling equipment
- Ensure all equipment is safety checked daily
- Tag "Out of Service" any damaged equipment

Employees

- Operate only that equipment for which they have been specifically trained and authorized
- Conduct required daily pre-use inspections, to ensure vehicle is safe
- Report any equipment damage of missing safety gear
- Follow all safety rules and operating procedures

TRAINING

Training for Powered Industrial Truck (PIT) Operators shall be conducted by an experienced operator, selected by Management. All operational training shall be conducted under close supervision. All training and evaluation must be completed before an operator is permitted to use a Powered Industrial Truck (forklift, etc.) without continual and close supervision.

All operator training and evaluation shall be conducted by persons who have the training, and experience to train powered industrial truck operators and evaluate their competence. The Company shall certify all authorized employees regarding competency on all types of equipment.

All employees are required to be trained and certified prior to operating each specific type of equipment.

Formal instruction includes lecture, discussion, interactive computer learning, videos, and written materials, Practical training involves instructor demonstrations and trainee exercises. Operator evaluation – critiques required.

Employees may operate a powered industrial truck only:

- Under the direct supervision of persons, selected by management, who have the knowledge, training, and experience to train operators and evaluate their competence; and
- Where such operation does not endanger the trainee or other employees.

TRAINING CONTENT

Training consists of a combination of formal instruction, practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

All trainers must have the knowledge and ability to teach and evaluate operators.

Initial Training

Powered industrial truck operators shall receive initial training in all the topics that follow below.

Truck-Related Training Topics

- Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate
- Differences between the truck and the automobile
- Truck controls and instrumentation: where they are located, what they do, and how they work
- Engine or motor operation
- Steering and maneuvering
- Visibility (including restrictions due to loading)
- Fork and attachment adaptation, operation, and use limitations
- Vehicle capacity
- Vehicle stability
- Any vehicle inspection and maintenance that the operator will be required to perform
- Refueling and/or charging and recharging of batteries

- Operating limitations
- Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate

Workplace Related Topics

- Surface conditions where the vehicle will be operated
- Composition of loads to be carried and load stability
- Load manipulation, stacking, and unstacking
- Pedestrian traffic in areas where the vehicle will be operated
- Narrow aisles and other restricted places where the vehicle will be operated
- Hazardous (classified) locations where the vehicle will be operated
- Ramps and other sloped surfaces that could affect the vehicle's stability
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation

Refresher Training and Evaluation

Refresher training, including an evaluation of the effectiveness of that training, shall be conducted to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

Mandatory refresher training shall be provided when unsafe operations are observed, after an accident, if operation of a different vehicle type and or changes in conditions occur.

Refresher training in relevant topics shall be provided to the operator when:

- The operator has been observed to operate the vehicle in an unsafe manner;
- The operator has been involved in an accident or near-miss incident;
- The operator has received an evaluation that reveals that the operator is not operating the truck safely;
- The operator is assigned to drive a different type of truck;
- A condition in the workplace changes in a manner that could affect safe operation of the truck;
- Once every 3 years an evaluation will be conducted of each powered industrial truck operator's performance.
- An evaluation of each operator’s performance shall be conducted at least once every 3 years for re-certification

HAZARDS

- Falling loads
- Overloading of equipment
- Impact with equipment

- Piercing of containers
- Loading dock roll off
- Chemical contact - battery acid
- Fires during refueling

HAZARD CONTROLS

- Control of equipment keys
- Authorized fueling and recharge areas
- Proper palletizing of material
- Marked travel lanes
- Equipment warning lights
- Seat belts
- Mounted fire extinguishers
- Proper personal protective equipment

PRE-QUALIFICATION

All candidates for Powered Industrial Truck (PIT) operators must meet the following basic requirements prior to starting initial or annual refresher training:

- Must have no adverse vision problems that cannot be corrected by glasses or contacts
- No adverse hearing loss that cannot be corrected with hearing aids
- No physical impairments that would impair safe operation of the PIT
- No neurological disorders that affect balance or consciousness
- Not taking any medication that affects perception, vision, or physical abilities

SAFE OPERATIONS PROCEDURES AND RULES

- Only authorized and trained personnel will operate PITs.
- Operator will always keep a clear view.
- Operators will always look in the direction of travel
- Use spotters, rear view mirrors, or other aids to increase visibility.
- All PITs will be equipped with a headache rack, fire extinguisher, rotating beacon, back-up alarm and seat belts. Seat belts will be worn at all times by the Operator.
- The operator will perform daily pre- and post-trip inspections.
- Any safety defects (such as hydraulic fluid leaks; defective brakes, steering, lights, or horn; and/or missing fire extinguisher, lights, seat belt, or back-up alarm) will be reported for immediate repair or have the PIT taken "Out of Service."
- Operators will follow the proper recharging or refueling safety procedures.
- Loads will be tilted back and carried no more than 6 inches from the ground. Loads that restrict the operator's vision will be transported backwards.
- PITs will travel no faster than 5 mph or faster than a normal walk.

- Hard hats will be worn by PIT Operators in high lift areas.
- Operator will sound horn and use extreme caution when meeting pedestrians, making turns and cornering.
- Equip PITs with headlights where general lighting is less than two lumens per square foot. In general, forklifts should have headlights if working at night, outdoors, or in any area where additional lighting would improve quality.
- Passengers may not ride on any portion of a PIT. Only the operator will ride PITs. "NO PASSENGERS" decals will be affixed on all PITs.
- If PITs are used as a man lift, an appropriate man lift platform (cage with standard rails and toe-boards) will be used.
- Be especially careful on loading docks, staying away from the edge.
- Aisle will be maintained free from obstructions, marked and wide enough (six foot minimum) for vehicle operation.
- Vehicle operators shall slow down and sound the horn at cross aisles and other locations where vision is obstructed.
- Lift capacity will be marked on all PITs. Operator will assure load does not exceed rated weight limits.
- When un-attended, PITs will be turned off, forks lowered to the ground and parking brake applied.
- All PITs (with exception of pallet jacks) will be equipped with a multi-purpose dry chemical fire extinguisher. (Minimum rating; 2A:10B:C)
- Operators are instructed to report all accidents, regardless of fault and severity, to Management. Management will conduct an accident investigation.
- Shall add physical barriers such as ramps, raised concrete staging areas and heavy-gauge safety chains in front of dock openings. Use protective guard rails.
- Shall add a "warning track" of yellow paint on the floor near dock openings.
- When loading rail cars and trailers, dock plates will be used. Operators will assure dock plates are in good condition and will store on edge when not in use.
- Rail cars and trailers shall be parked squarely to the loading area and have wheels chocked in place. Operators will follow established Docking/Un-Docking Procedures.
- Drive slowly into and out of warehouses or other buildings. Going from bright daylight into a darkened warehouse may blind drivers just long enough to hit another worker, vehicle or object.
- Prohibiting arms or legs from being placed between the uprights of the mast or outside the running lines of the truck.

Potential Hazards

Blocked visibility, including partially blocked visibility, increases the chances of accidents.

These are some potential hazards when visibility is impaired:

- Collision
- Falling load
- Falling off loading dock
- Worker struck or crushed by forklift

The Company shall ensure signalers are in place, or other measures are in place to minimize the risks.

CHANGING AND CHARGING STORAGE BATTERIES

- Battery charging installations shall be located in areas designated for that purpose.
- Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.
- Reinstalled batteries shall be properly positioned and secured in the truck.
- A carboy tilter or siphon shall be provided for handling electrolyte.
- When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- Trucks shall be properly positioned, and brake applied before attempting to change or charge batteries.
- Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.
- Smoking is prohibited in the charging area.
- Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- Remove all Metallic jewelry before recharging. Tools and other metallic objects shall be kept away from the top of uncovered batteries. [29 CFR 1910.178(g)(12)]

Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body must be provided within the work area for immediate emergency use. [29 CFR 1910.151(c)]

TRUCKS AND RAILROAD CARS

- The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.
- The brakes of highway trucks shall be set, and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.

- Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.
- Fixed jacks may be necessary to support a semitrailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.
- Positive protection shall be provided to prevent railroad cars from being moved while dock boards or bridge plates are in position.

OPERATIONS

- If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition.
- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks.
- Arms or Legs are prohibited from being placed between the uprights of the mast or outside the running lines of the truck.
- When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.
    - A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle, and it is not in his view.
    - When the operator of an industrial truck is dismounted and within 25 ft. of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.
- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.
- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.
- A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
- Trucks shall not be parked so as to block fire aisles, access to stairways, or fire equipment.

TRAVELING

- All traffic regulations shall be observed, including authorized speed limits. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.
- The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.
- Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations shall not be passed.
- The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- The driver shall be required to look in the direction of and keep a clear view of the path of travel.
- Grades shall be ascended or descended slowly. When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade. On all grades the load and load engaging means shall be tilted back if applicable and raised only as far as necessary to clear the road surface.
- Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- Stunt driving and horseplay shall not be permitted.
- The driver shall be required to slow down for wet and slippery floors.
- Dock board or bridge plates shall be properly secured before they are driven over. Dock board or bridge plates shall be driven over carefully and slowly, and their rated capacity never exceeded.
- Running over loose objects on the roadway surface shall be avoided.
- While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

LOADING

- Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.
- Only loads within the rated capacity of the truck shall be handled.
- The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.
- Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.

- A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.
- Extreme care shall be used when tilting the load forward or backward, particularly when highly tiered. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall 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 shall be used.

IN CASE OF A TIP OVER

For tip overs on sit-down counterbalanced trucks:

- Don't jump - Stay in the forklift.
- Hold tight to the steering wheel.
- Brace feet.
- Lean AWAY from the impact.
- Lean forward.

Note: Tip over procedures for other types of forklifts may vary. For example, operators of stand-up forklifts with rear-entry access should step backwards off the forklift if a tip over occurs.

FUELING SAFETY

- Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.
- Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
- No truck shall be operated with a leak in the fuel system until the leak has been corrected.
- Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

MAINTENANCE OF POWERED TRUCKS

- Any power-operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.
- Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.
- Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.
- All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.
- Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not

provided by the manufacturer or by the elimination of any parts. Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.

- Equipment shall be examined before being placed in service and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily. Where industrial trucks are used on a round-the-clock basis, they shall be examined prior to use each shift. Defects when found shall be immediately reported and corrected.
- When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
- Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 deg. F.) solvents shall not be used. High flash point (at or above 100 deg. F.) solvents may be used.

SAFE OPERATION PROCEDURE FOR REFILLING LPG TANK

- No Smoking.
- Move LPG PIT outside for refueling.
- Turn off PIT.
- LPG tanks will be removed in the following order:
  - Shut off service valve
  - Disconnect tank from hose
  - Unbuckle and remove tank from bracket
- LPG tanks will be replaced in to following order:
  - Place tank in bracket and re-buckle
  - Reconnect hose to tank and tighten firmly
  - Open valve slowly and assure proper seal

Note: Federal Law Prohibits dispensing an improper fuel type into any Vehicle or into a non-approved fuel container.

In Case of LPG Leaks or Tank Rupture

- DO NOT start or move the PIT.
- If fuel hose is leaking, close valve immediately and place PIT "Out of Service" until repaired.
- If tank ruptures, warn other, immediately leave the area (at least 50 feet) and notify Management. Do not re-enter the area until cleared by Management.

Powered Industrial Truck Pre-Use Checklist

A check of the following items (as applicable) is to be conducted by the operator prior to use each shift.

- ✓ Lights
- ✓ Horn
- ✓ Brakes
- ✓ Leaks
- ✓ Warning Beacon
- ✓ Backup Warning Alarm
- ✓ Fire Extinguisher

If any deficiencies are noted, the unit is to be placed OUT OF SERVICE until the problem has been corrected. Additionally, it is the operator's responsibility to notify the immediate supervisor and fill out a maintenance request.

Gas Hazards – Air Monitoring/Contaminant Safety

PURPOSE

The purpose of this safety policy and procedure is to establish guidelines to protect the health of employees of **Pacific Northwest Towers** from hazards due to the inhalation of airborne contaminants such as gases, fumes, mists, vapors, particulates. **Pacific Northwest Towers** is hereafter referred to as "The Company."

An air contaminant is any substance which is accidentally or unwillingly introduced into the air, having the effect of rendering the air toxic or harmful to some degree. Through inhalation, airborne dust, fumes, vapors, mists, and gases may all be taken into the body. These contaminants can irritate the skin, eyes, nose, throat, and lungs, or they may also be absorbed into the bloodstream therefore affecting internal organs. This document establishes guidelines to protect the health of The Company employees from these air contamination hazards. It includes training provisions for affected employees and discussion on the warning signs of air contaminant overexposure. Discussion is also presented concerning when work area evaluations may be required. Additionally, this document presents a brief exposure assessment methodology and a control recommendation hierarchy.

This safety policy and procedure is established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.1000) and Occupational Safety and Health Standards for Construction Industry (29 CFR 1926.1101).

RESPONSIBILITIES

Managers/Unit Heads

Managers/Unit Heads are responsible for identifying the employees affected by this safety policy and procedure. Managers/Unit Heads will obtain and coordinate the required training for the affected employees. Managers/Unit Heads should be generally familiar with exposures in their organization and the location of those exposures. They will also ensure compliance with this safety policy and procedure through their auditing process.

Supervisors

Supervisors are responsible for ensuring that the PPE is used when required, proper work practices are used, engineering controls are in good operating condition, and administrative controls are used when feasible. Additionally, they are responsible for recognizing possible exposures by odor, mucous membrane irritation, headaches, nausea, visible dust emissions, and vapors.

Employees

Employees shall be responsible for recognizing possible exposures by odor, mucous membrane irritation, headaches, nausea, visible dust emissions, and vapors.

Employees are to follow work practices for the process, use PPE as required, activate engineering controls when necessary, and report suspicious circumstances to their supervisors.

Employees will be aware of the provisions of site-specific contingency/emergency plans and participate in drills. Employees should participate in emergency evacuation drills and practice rescue procedures.

Qualified Person

Qualified persons shall be responsible for conducting air monitoring where there is suspicion of air contamination. They shall perform exposure assessments, workplace evaluation, and recommend exposure controls. They shall also provide air contaminants training to affected employees and their supervisors.

SIGNS OF OVEREXPOSURE

Overexposure to contaminants may not always show warning signs. Most gases and vapors provide warnings such as headaches, nausea, mucous membrane irritation, nervous system dysfunction, and rashes in a short period of time (minutes to hours). Some gases and most particulates do not have immediate warning signs and are insidious in their health effects (the signs of a disease process may take years to manifest).

Anytime an employee claims to have experienced a warning condition or has become sick while using chemicals or while engaged in a particular process, he or she is to report this condition immediately to his or her supervisor.

AIR MONITORING

The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed. Initial screening for identification is often qualitative, i.e., the contaminant, or the class to which it belongs, is demonstrated to be present but the determination of its concentration (quantification) must await subsequent testing. Two principal approaches are available for identifying and/or quantifying airborne contaminants:

- The onsite use of direct-reading instruments.
- Laboratory analysis of air samples obtained by gas sampling beg, filter, sorbent, or wet-contaminant collection methods.

Portable Air Monitoring Equipment

- Portable air monitors are hand-held instruments that measure the concentration of combustible or toxic gases and vapors as well as oxygen concentration. All instruments used in USPL sound an audible alarm when concentrations exceed preset limits. Since air monitoring equipment is designed for various applications, each instrument may have its own operating characteristics and limitations.

- Specific initial and continuous monitoring requirements for Hot Work, Confined Space, and Excavations are specified in the respective policies. These policies should be referenced for air monitoring specifics.
- **Joaquin Blas.** should be consulted regarding air monitoring equipment and procedures.

ATMOSPHERIC HAZARDS

Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist more than 10% of its Lower Flammable Limit (LFL),
- Airborne combustible dust at a concentration that meets or exceeds its LFL,
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent,
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart D—Occupational Health and Environmental Control, or in Subpart Z—Toxic and Hazardous Substances, of this part and which could result in employee exposure more than its dose or permissible exposure limit,
- Any other atmospheric condition that is immediately dangerous to life or health.

Three Main Types of Hazardous Atmospheres

1. Unsafe Oxygen levels, either an oxygen deficient below 19.5% or oxygen enriched above 23.5%.
2. Flammable gases.
3. Toxic vapors and/or toxic dust particulates.

Atmospheric Hazard Sources

Types of atmospheric hazards:

- Flammables
  - Flammable gas, vapor or mist in excess of 10% of its Lower Flammable Limit (LFL)
- Combustible dust
  - Airborne combustible dust at a concentration that meets or exceeds its LFL
- Oxygen
  - Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent
- Atmospheric concentration
  - Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart D—Occupational Health and Environmental Control, or in Subpart Z—Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit
- Any other atmospheric condition that is immediately dangerous to life or health

ATMOSPHERIC TESTING

Atmospheric testing is required for two distinct purposes; evaluation of the hazards of the permit space and verification that acceptable conditions exist for entry into that space.

Evaluation Testing

The atmosphere within a confined space must be tested using equipment that is designed to detect the chemicals that may be present at levels that are well below the defined exposure limits.

Evaluation testing is done to:

- Determine what chemical hazards are or may become present in the space's atmosphere.
- Identify what steps must be followed and what conditions must be met to ensure that atmospheric conditions are safe for a worker to enter the space.

The testing results and the decisions about what steps must be followed before entry must be evaluated by, or reviewed by, a technically qualified professional like an OSHA consultation service, a certified industrial hygienist, a registered safety engineer, or a certified safety professional. The technically qualified professional must consider all the serious hazards in his/her evaluation or review.

Verification Testing

Before a permit space that may have a hazardous atmosphere can be entered, the atmosphere must be tested using the steps identified on the permit (developed during evaluation testing). Verification testing is done to make sure that the chemical hazards that may be present are below the levels necessary for safe entry, and that they meet the conditions identified on the permit.

Test the atmosphere in the following order:

A. Oxygen
B. Combustible gases
C. Toxic gases and vapors

The testing results and the actual test concentrations must be recorded on the permit near the levels identified for safe entry.

Duration of Testing

For each test required on the permit, you must allow enough time for the air from the space to be drawn into the equipment and for the sensor (or other detection device) to react to the chemical if it is present. This is considered the "minimum response time" and it will be noted by the manufacturer in the operator's manual. Be aware that you will need to add time to this "minimum response time" if you have attached hosing or a probe extension to the inlet. The additional time is needed to allow the air from the different depths of the space to be pulled into the equipment inlet.

Testing Conditions in Spaces that May Have Layered Atmospheres
For permit spaces that are deep or have areas leading away from the entry point, the atmosphere may be layered or may be different in remote areas. For these spaces, testing must be done in the area surrounding the worker, which is considered four (4) feet in the direction of travel and to each side. If a sample probe is used to do the testing, then the worker must move slowly enough so that testing is completed, keeping the equipment "response time" in mind, before he/she moves into the new area.

Retesting the Space During Entry or Before Re-Entry
Test the permit space routinely to make sure that the atmospheric conditions continue to be safe for entry.

Title 29 Code of Federal Regulations 1910.146, Appendix B

GAS HAZARD AWARENESS TRAINING

- Locations of alarm stations
- Gas monitoring equipment (i.e., portable, and fixed detection)
- Gas alarms
- Gas hazards
- Characteristics of gases such as oxygen deficiency, oxygen or nitrogen enrichment, carbon monoxide and hydrogen sulfide as well as any other potentially present harmful gas
- Gas hazard training shall also cover any site, plant or department specific gases of concern or that could be harmful.
- Signs and symptoms of exposure
- Personal rescue procedures
- Use and care of SCBA (self-contained breathing apparatus) to include donning and emergency procedures if applicable.
- Evacuation procedures
- Staging areas
- Primary and secondary

Documentation
- Gas hazard awareness training shall be documented and available for review.

Detection
- Each employee shall use a portable gas detector as required in all high gas hazard areas.

Monitor Calibration

All gas monitors shall be calibrated per manufacturer's recommendations and have a current calibration sticker on the monitor.

Bump Tests

Daily bump tests are performed to ensure the monitor and alarms are working correctly. Bump test are required to be completed at the beginning of each day the monitor is in use per the requesting client and manufacturer's guidelines to ensure the monitor is functioning correctly.

TRAINING

Training shall be provided upon initial employment and/or job reassignment. Retraining shall be provided when job conditions change. Periodic refresher training shall be provided at the discretion of the supervisor. Employees who may be exposed to air contaminants in their job duties shall receive training on air contaminants. Gas hazard awareness training must be provided before initial assignment and annually thereafter.

Their supervisors will also receive this training which will consist of:

- Contaminant name and characteristics (physical and chemical properties)
- Exposure route
- Symptoms of over exposure
- Toxic health effects (acute and chronic)
- Work practices used to reduce exposures
- Engineering controls to reduce exposures
- Administrative controls to reduce exposures

Qualified persons who perform air monitoring shall receive additional training which includes:

- Air sampler air flow calibration
- Sample train set ups
- Analytical procedures
- Air monitoring protocol

OSHA Reference Methods

- Exposure calculations
- Exposure data statistical analyses

Grounding Fault Protection - GFCI

PURPOSE

The purpose of this document is to outline safety requirements surrounding the use and exposure to electricity, and to eliminate all injuries resulting from possible malfunctions, improper grounding and defective electrical tools for **Pacific Northwest Towers**; hereafter referred to as "The Company." This policy applies to all sites, personnel and contractors; this policy must be followed at all times.

RESPONSIBILITIES

Supervisors shall be responsible to implement the assured equipment grounding conductor program and shall be designated as competent persons for the program. One or more competent persons must be designated as set forth in CFR 1926.404(b) (11) (iii) & Cal/OSHA T8 CCR 2405.4 to implement the program.

Employees are responsible for abiding by the following policy and requirements of this program. In addition, personnel and employees shall be held responsible to perform regular visual inspections and to remove defective equipment from service. All personnel shall notify a supervisor of defective equipment as soon as reasonably possible.

POLICY

It is the policy of The Company to establish and implement an assured equipment grounding conductor program on all job sites covering all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use by personnel. In fact, OSHA requires that employees shall use either ground fault circuit interrupters (GFCI) or assured equipment grounding conductor program to protect personnel from electrical shock while working.
A copy of this policy shall be placed at each jobsite for inspection and copy by OSHA officials and any affected employee/personnel.

The Company shall use GFCI's in lieu of an assured grounding program as afforded by CFR 1926.400 (h).

GROUND FAULT CIRCUIT INTERRUPTERS

Ground fault circuit interrupters (GFCI's) are not required for 120 volts, single phase, or 15- and 20- ampere receptacles outlets where all of the requirements of this procedure are implemented at worksites as part of the permanent wing of the building or structure. These are in use by employees, shall have approved GFCI's for personal protection.

Supervisors are designated to implement the assured equipment grounding conductor program: 1926:32 (f) which defines competent persons as one who is capable of identifying existing and predictable hazards in the surrounding area or working conditions which are unsanitary, hazardous or dangerous to employees, and who is authorized to take prompt corrective measures to eliminate them.

Equipment found damaged or defective may not be used until repaired.

Supervisors shall be responsible and accountable for the following:

- Each cord set, attachment cap, plug and receptacle of cord set, and any equipment connected by cord and plug except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins, or insulation damage, and for indication for possible internal damage.
- Making sure both forms of testing are being performed when checking electrical equipment;
    - One is a Continuity Test to ensure that the equipment grounding conductor is electrically continuous. It must be performed on all cord sets, receptacles which are not part of the permanent wiring of the building or structure, and on cord-and-plug-connected equipment which is required to be grounded. This test can be performed using a simple continuity tester, such as a lamp and battery, a bell and battery, an ohm meter, or a receptacle tester.
    - The other test is a GFI Test that must be performed on receptacles and plugs to ensure that the equipment grounding conductor is connected to its proper terminal. This test can be performed with the same equipment used in the first test.
- Tests shall be documented on the log for the assured equipment grounding conductor program and shall be on all work-sites for inspection by OSHA officials and/or any affected employee.

In accordance with OSHA standard 1926.21, supervisors shall attend training sessions as the company may deem necessary.

The equipment grounding conductor shall be connected to its proper terminal:

- Before each use.
- Before equipment is returned to service following any repairs.
- Before equipment is used such as when a cord has been run over.
- At intervals not to exceed 3 months,
- Cord sets & receptacles which are fixed & not exposed to damage shall be tested at intervals not exceeding 6 months.

Testing

All required tests shall be performed:

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

Tests performed as required by this program shall be recorded as to the identity of each receptacle, cord set, & cord & plug connected equipment that passed the test and shall indicate the last date tested or interval for which is was tested. This record shall be kept by means of logs, color coding, or other effective means & shall be maintained until replaced by a more current record. These records shall be made available at the job site for inspection by the Assistant Secretary & any affected employees.

Equipment that does not meet the prescribed test shall not be put into service. In this case, the following shall occur:

- All equipment grounding conductors shall be tested for continuity and shall be electrically continuous
- Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding shall be connected to its terminal.

Below is a recommended color code labeling system using colored tape to mark equipment. That shows how The Company tracks inspection and testing on a Quarterly, Monthly and/or Numeric tracking basis.

Assured Equipment Grounding Conductor Labeling Program			
Month/Quarter Test is Performed	**Quarterly Coding Scheme**	**Monthly Coding Scheme**	**Numeric Coding Scheme**
Month	**Quarterly**	**Monthly**	**Monthly**
January	**White (Winter)**	White	1
February		White/Yellow	2
March		White/Blue	3
April	**Green (Spring)**	Green	4
May		Green/Yellow	5
June		Green/Blue	6
July	**Red (Summer)**	Red	7
August		Red/Yellow	8
September		Red/Blue	9
October	**Orange (Autumn)**	Orange	10
November		Orange/Yellow	11
December		Orange/Blue	12
Repair or Incident	**Brown**	Brown	0

Lockout Tagout - Control of Hazardous Energy

PURPOSE

The purpose of this document is to outline the Lockout Tagout Program for **Pacific Northwest Towers**; hereafter referred to as "The Company." Control of Hazardous energy is the purpose of the Lockout Tagout Program.

This program establishes the requirements for isolation of both kinetic and potential electrical, chemical, thermal, hydraulic, and pneumatic and gravitational energy prior to equipment repair, adjustment, or removal. Reference: OSHA Standard 29 CFR 1910. 147, the control of hazardous energy.

POLICY

Hazards

Improper or failure to use Lockout Tagout procedures may result in:

- Electrical shock
- Chemical exposure
- Skin burns
- Lacerations and amputation
- Fires and explosions
- Chemical releases
- Eye injury
- Death

HAZARD CONTROLS

- Only authorized and trained employees may engage in tasks that require use of Lockout Tagout procedures.
- All equipment has single sources of electrical power.
- Lockout procedures have been developed for all equipment and processes.
- Restoration from Lockout is a controlled operation.

Potential energy may include any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

AUTHORIZED EMPLOYEES TRAINING

All Maintenance Employees, Department Supervisors and Janitorial employees will be trained to use the Lock and Tagout Procedures. To ensure the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training

will be conducted by the Maintenance Supervisor or Safety Coordinator at time of initial hire. Retraining shall be held at least annually. The training will consist of the following:

- Review of General Procedures;
- Review of Specific Procedures for machinery, equipment, and processes;
- Location and use of Specific Procedures;
- Procedures when questions arise;
- Recognition of hazardous energy source;
- Type and magnitude of energy available;
- Methods and means necessary for energy isolation and control;
- All affected employees are instructed in the purpose and use of the energy control procedure;
- The tag is never to be ignored or defeated in any way.

Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

AFFECTED EMPLOYEE TRAINING

- Only trained and authorized Employees will repair, replace, or adjust machinery, equipment, or processes.
- Affected Employees may not remove Locks, locking devices or tags from machinery, equipment, or circuits.
- Purpose and use of the lockout procedures.
- All affected employees are instructed in the purpose and use of the energy control procedure.
- When tagout systems are used including the limitations of a tag (tags are warning devices and do not provide physical restraint).
- The tag is never to be ignored or defeated in any way.

OTHER EMPLOYEE TRAINING

- Only trained and authorized Employees will repair, replace, or adjust machinery or equipment.
- Other Employees may not remove Locks, locking devices or tags from machinery, equipment, or circuits.
- Any other employee whose work operations are or may be in an area where energy control procedures may be utilized.
- The tag is never to be ignored or defeated in any way.

RETRAINING

Retraining is required when there is a change in job assignments, in machines, a change in the energy control procedures, or a new hazard is introduced.

All training and retraining shall be documented, signed, and certified.

PREPARATION OF LOCK OUT AND TAG OUT TRAINING

A Lockout Tagout Survey has been conducted to locate and identify all energy sources to verify which switches or valves supply energy to machinery and equipment. Dual or redundant controls have been removed.

Devices shall indicate the identity of the employee applying the device.

A Tagout Schedule has been developed for each piece of equipment and machinery. This schedule describes the energy sources, location of disconnects, type of disconnect, special hazards and special safety procedures. The schedule will be reviewed each time to ensure employees properly lock and tag out equipment and machinery. If a Tagout Schedule does not exist for a particular piece of equipment, machinery, and process, one must be developed prior to conducting a Lockout Tagout. As repairs and/or renovations of existing electrical systems are made, standardized controls will be used.

ROUTINE MAINTENANCE AND MACHINE ADJUSTMENTS

Lock and Tag Out procedures are not required if equipment must be operating for proper adjustment. This rare exception may be used only by trained and authorized Employees when specific procedures have been developed to safely avoid hazards with proper training. All consideration shall be made to prevent the need for an employee to break the plane of a normally guarded area of the equipment by use of tools and other devices.

LOCKS HASPS AND TAGS

All Qualified Maintenance Personnel will be assigned a lock with one key, hasp, and tag. All locks will be keyed differently, except when a specific individual is issues a series of locks for complex Lockout Tagout tasks. In some cases, more than one lock, hasp and tag are needed to completely de-energize equipment and machinery. Additional locks may be checked out from the Department or Maintenance Supervisor on a shift-by-shift basis. All locks and hasps shall be uniquely identifiable to a specific employee.

REQUIREMENTS FOR LOCKOUT TAGOUT DEVICES

Lockout devices and tagout devices shall be singularly identifiable; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

- **Durable**
  - Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
  - Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
  - Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
- **Standardized**
  - Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.
- **Substantial**
  - Lockout devices. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
  - Tagout devices. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.
- **Identifiable**
  - Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

GENERAL LOCK AND TAGOUT PROCEDURES

Before working on, repairing, adjusting, or replacing machinery and equipment, the following procedures will be utilized to place the machinery and equipment in a neutral or zero mechanical state. The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged, and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device. 1910.333(b)(2)(ii)(B)

A lock and tag shall be placed on each disconnecting means to deenergize circuits and equipment on which work is to be performed. Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

A Qualified Person
A qualified person shall verify that the equipment cannot be restarted as well as test and verify that the circuit elements and equipment part(s) are deenergized. A qualified person shall conduct tests and visual inspections to verify all tools, shorts, grounds, etc. have been removed so that circuits and equipment can be safely energized. 1910.333(b)(2)(v)(A)

SHIFT OR PERSONNEL CHANGES

Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

ENERGY ISOLATING DEVICE

If an energy isolating device is not capable of being locked out, The Company energy control program shall utilize a tagout system. If an energy isolating device is capable of being locked out, The Companies energy control program shall utilize lockout, unless The Company can demonstrate that the utilization of a tagout system will provide full employee protection as set forth in 1910.147(c)(2)(iii) paragraph (c)(3) of this section. After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

FULL EMPLOYEE PROTECTION

When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and The Company shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program. 1910.147(c)(3)(i)

In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, The Company shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

Notification of Employees

Affected employees shall be notified by The Company or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment. 1910.147(c)(9)

Preparation for Shutdown

- Before authorized or affected employees turn off a machine or piece of equipment, the authorized employee will have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy.
- An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
- Notify all affected Employees that the machinery, equipment, or process will be out of service.

Machine or Equipment Shutdown

- The machine or equipment will be turned or shut down using the specific procedures for that specific machine.
- An orderly shutdown will be utilized to avoid any additional or increased hazards to employees as a result of equipment de-energization.
- If the machinery, equipment, or process is in operation, follow normal stopping procedures (depress stop button, open toggle switch, etc.).
- Move switch or panel arms to "Off" or "Open" positions and close all valves or other energy isolating devices so that the energy source(s) is disconnected or isolated from the machinery or equipment.

Machine or Equipment Isolation

- All energy control devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Protective Materials and Hardware

- Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by The Company for isolating, securing, or blocking of machines or equipment from energy sources.
- Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the requirements for 29 CFR 1910.147.

Lockout or Tagout Device Application

- Lockout or tagout devices will be affixed to energy isolating devices by authorized employees.
- Lockout devices will be affixed in a manner that will hold the energy isolating devices from the "safe" or "off" position.
- Where tagout devices are used they will be affixed in such a manner that will clearly state that the operation or the movement of energy isolating devices from the "safe" or "off" positions is prohibited.
- The tagout devices will be attached to the same point a lock would be attached.
- If the tag cannot be affixed at that point, the tag will be located as close as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.
- Lock and tag out all energy devices by use of hasps, chains and valve covers with an assigned individual lock.

Stored Energy

- Following the application of the lockout or tagout devices to the energy isolating devices, all potential or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.
- Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete, or until the possibility of such accumulation no longer exists.
- Release stored energy (capacitors, springs, elevated members, rotating fly wheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

Verification of Isolation

- Prior to starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energization of the machine or equipment have been accomplished.
- After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

Caution: After Test, place controls in neutral position.

GROUP LOCKOUT SETTINGS/MULTIPLE WORKERS

Where a crew of authorized employees may use a lockout or tagout device, the following procedures shall be followed to ensure the group of employees a level of protection equal to that provided by a personal lockout or tagout device.

An authorized employee will be designated to have primary responsibility for a set number of employees working under the protection of a group lockout or Tagout device.

- A pre-work kick-off safety meeting will be held to review the lockout tagout procedure for the project
- Each employee shall attach a personal lockout or tagout device to the group's device while he/she is working and then removes it when finished
- During shift change or personnel changes, there should be specific procedures to ensure the continuity of lockout or tagout procedures
- Documentation shall be specific and shall be retained

Extended Lockout Tagout

Should the shift change before the machinery or equipment can be restored to service, the lock and tag out must remain. If the task is reassigned to the next shift, those Employees must lock and tag out before the previous shift may remove their lock and tag.

Release from Lockout Tagout

Before lockout or tagout devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

- The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.
- The work area will be checked to ensure that all employees have been safely positioned or removed. Before the lockout or tagout devices are removed, the affected employees will be notified that the lockout or tagout devices are being removed.
- Each lockout or tagout device will be removed from each energy isolating device by the employee who applied the device.

LOTO PROCEDURE FOR ELECTRICAL PLUG TYPE EQUIPMENT

This procedure covers all Electrical Plug-Type Equipment such as Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc.

When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup:

- Unplug Electrical Equipment from wall socket or in-line socket.
- Attach "Do Not Operate" Tag and Plug Box and Lock on end of power cord.

An exception is granted to not lock and tag the plug is the cord and plug remain in the exclusive control of the Employee working on, adjusting, or inspecting the equipment.

- Test Equipment to assure power source has been removed by depressing the "Start" or "On" Switch.
- Perform required operations.
- Replace all guards removed.
- Remove Lock and Plug Box and Tag.
- Inspect power cord and socket before plugging equipment into power source. Any defects must be repaired before placing the equipment back in service.

NOTE: Occasionally used equipment may be unplugged from power source when not in use.

LOTO PROCEDURE INVOLVING MORE THAN ONE EMPLOYEE

In the preceding SOPs, if more than one Employee is assigned to a task requiring a lock and tag out, each must also place his or her own lock and tag on the energy isolating device(s).

MANAGEMENT OF LOCK AND TAGOUTS

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the Employee leave the facility before removing his/her lock and tag, the Maintenance Manager may remove the lock and tag. The Maintenance Manager must be assured that all tools have been removed, all guards have been replaced and all Employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

REMOVAL OF AN AUTHORIZED EMPLOYEE'S LOCKOUT TAGOUT BY THE COMPANY

Locks/tags will only be removed in cases where the authorized employee who applied it is not available. When the authorized employee who applied the Lockout Tagout device is not available to remove it, that device may be removed by the safety manager or their designee by following the specific procedure.

Each location must develop written procedures that comply with 29 CFR 1910.147(e)(3).

Emergency procedures for removing Lockout Tagout should include the following:

- Making all reasonable efforts to contact the authorized and affected employees to inform them that their LOTO device has been removed.
- Verification by The Company that the authorized employee who applied the LOTO device is not at the facility by checking timecards, parking lot, radio announcement, etc.
- A thorough inspection of the machine or device shall be made by **Joaquin Blas.** to confirm that the machine or equipment components are operationally intact.
- **Joaquin Blas.** or designee shall remove the LOTO device, providing that they have determined that the starting up of the machine/equipment will not endanger other personnel.
- Informing and providing the employee who's locks/tags were removed with replacement locks/tags.

LOCKOUT OR TAGOUT DEVICES REMOVAL

Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of The Company, provided that specific procedures and training for such removal have been developed, documented, and incorporated into The Company's energy control program. The Company shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. 29 CFR 1910.147 (e)(3)

The specific procedure shall include at least the following elements:

- Verification by The Company that the authorized employee who applied the device is not at the facility:
- Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
- Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

If an energy isolating device is **not** capable of being locked out, the company's energy control program under this section shall utilize a tagout system. If an energy isolating device is capable of being locked out, the employer's energy control program under this section shall utilize lockout, unless the company can demonstrate that the utilization of a tagout system, will provide full employee protection as set forth in paragraph (c)(3) of section 1910.147(c)(3)(iii).

After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed,

energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

TESTING OR POSITIONING OF MACHINES, EQUIPMENT OR COMPONENTS

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions in accordance to 29 CFR 1910.147 (f)(1)(i) shall be followed:

- Clear the machine or equipment of tools;
- Remove employees from the machine or equipment area;
- Remove the lockout or tagout devices as specified in 29 CFR 1910.147 (e)(3);
- Energize and proceed with testing or positioning;
- Deenergize all systems and reapply energy control measures.

CONTRACTORS

Contractors, working on company property and equipment must use this Lockout Tagout procedure while servicing or maintaining equipment, machinery, or processes. Periodic inspections of the energy control procedure must be conducted at least annually to ensure that the procedure is being followed. The program should address who performs the inspection (it must be someone other than those actually using the Lockout Tagout in progress). A certified review of the inspection including date, equipment, employees, and the inspector should be documented. 1910.147(c)(6)(i) through 1910.147(c)(6)(ii)

DEFINITIONS

Authorized (Qualified) Employees are the only ones certified to lock and tagout equipment or machinery. Whether an employee is considered to be qualified will depend upon various circumstances in the workplace. It is likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be "qualified" for the performance of those duties.

Affected Employees are those employees who operate machinery or equipment upon which lockout or tagging out is required under this program. All affected employees will be Notified before the application of lockout or tagout devices. Training of these individuals will be less stringent in that it will include the purpose and use of the lockout procedures.

Other Employees are identified as those that do not fall into the authorized, affected or qualified employee category. Essentially, it will include all other employees. These employees will be

provided instruction in what the program is and not to touch any machine or equipment when they see that it has been locked or tagged out.

Zero Energy State is a condition in which all sources of energy have been removed or neutralized.

Mobile Equipment

PURPOSE

The purpose of this document is to outline safety policy and procedures for the operation of mobile equipment devices for **Pacific Northwest Towers**; hereafter referred to as "The Company."

The Mobile Equipment Program is set forth to ensure that only qualified and authorized team members operate equipment. The National Electrical Safety Code (ANSI-C2 Standard) specifies the grounding methods for electrical supply and communications facilities. The National Electrical Code (NFPA-70 Standard) specifies the grounding methods for all facilities that are within or on public or private buildings or other structures.

RESPONSIBILITIES

Management

- Shall enforce the Mobile Equipment Program
- Ensure that only qualified and authorized employees operate mobile equipment

Operators

- Operators must be familiar with the operation of the equipment as well as all of the guidelines in this program.

OPERATIONS

- The Mobile Equipment Program applies to all team members at The Company.
- Only qualified and authorized operators are allowed to operate mobile equipment.
- Operators must be trained on the specific equipment to be operated, have approval from the management prior to initial assignment, to be considered authorized.
- Before starting the engine, the driver shall fasten seat belts and adjust them for a proper fit.
- The operator shall not use or attempt to use any vehicle in any manner or for any purpose other than for which it is designated.
- Unauthorized personnel shall not be permitted to ride on equipment unless it is equipped to accommodate passengers safely.
- The operator shall make sure the warning signal is operating when the equipment is backing up.
- No operator shall operate mobile equipment without the protection of an enclosed cab, unless using approved eye protection.

- The operator shall not load the vehicle/equipment beyond its established load limit and shall not move loads which because of the length, width, or height that have not been centered and secured for safe transportation.
- Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.
- All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this subpart.
- The operator of a gasoline or diesel vehicle shall shut off the engine before filling the fuel tank and shall ensure that the nozzle of the filling hose makes contact with the filling neck of the tank. No one shall be on the vehicle during fueling operations except as specifically required by design. There shall be no smoking or open flames in the immediate area during fueling operation.

TRANSMISSION LINE GROUND

When lightning strikes an overhead ground or static wire on a transmission line, the lightning current is conducted to ground through the metal tower or the ground wire installed along the pole.

The top of the structure is raised in potential to a value determined by the magnitude of the lightning current and the surge impedance of the ground connection.

If the impulse resistance of the ground connection is high, this potential can be many thousands of volts. If the potential exceeds the insulation level of the equipment, flashover will result, causing a power arc that will initiate the operation of protective relays and removal of the line from service.

If the transmission structure is well grounded and proper coordination exists between the ground resistance and the conductor insulation, flashover can usually be avoided.

The transmission-line grounds are typically installed at each structure to obtain a low ground resistance.

UNATTENDED EQUIPMENT AT NIGHT

All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment. OSHA 1926.600(a)(1)

OPERATING EQUIPMENT UNDER OVERHEAD LINES

Clearance Distance

When operating equipment or working near overhead lines whether in an elevated position or on the ground, the person or conductive object should not approach an unguarded and energized line closer than 20 feet unless approved by the Utility Owner.

Mobile equipment in transit with boom, crane or other structure lowered will maintain clearance distances as follows:

- Up to 0.75 kV = at least 4 feet
- 0.75 to 50 kV = 6 feet
- 50 to 345 kV = 10 feet
- 345 to 750 kV = 16 feet
- 750 to 1,000 kV = 20 feet
- Over 1,000 kV = as established by utility owner/operator

All equipment covered by this subpart shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines:

- Load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet.
- A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.
- Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:
    - The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and
    - Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

Combustible and flammable materials shall be removed from the immediate area prior to operations.

GROUNDING AND BONDING

- Use barricades or insulation to protect employees from hazardous ground fault situations which can develop within the first few feet or more outward from the grounding point.
- Ground and bond welded pipe strings at a minimum of 500-foot intervals.
- Additional temporary grounds are required when voltage levels in excess of 15 volts or greater are found.
- Bonding and grounding should be performed on stacked pipe.
- Bonding across cut-outs and tie-ins should be completed before other work begins in the area.
- Installation of grounding mats at valve settings, cathodic test stations, cathodic rectifier installations and other appurtenances that have direct electrical contact to the pipe is recommended.
- Voltage testing of all pipe, equipment and foreign structures in the work areas should performed at regular 4-hour intervals and if conditions change (e.g., rain) or as otherwise stipulated by the Owner/Operator.

GROUNDING COILS AND GROUNDING PLATES

- A grounding coil is a spiral coil of bare copper wire placed at the bottom of a pole.
- The wire of the coil continues up the pole as the ground-wire lead.
- Sometimes the coil is wound around the lower end of the pole's side a few times as a helix to increase the amount of wire surface in contact with the earth.
- Grounding coils should have enough turns to make good contact with the earth.
- A coil having seven turns and 13 ft or more of wire would provide satisfactory ground contact.
- Number 6 or larger AWG soft-drawn or annealed copper wire should be used.
- To prevent the coil from acting as a choke coil, the ground lead from the innermost turn is stapled to all the other turns.

COUNTERPOISE

If the soil has a high resistance, a grounding system called a counterpoise may be necessary.

The counterpoise for an overhead transmission line consists of a special grounding terminal that reduces the surge impedance of the ground connection and increases the coupling between the ground wire and the conductors.

Counterpoises are normally installed for transmission-line structures located in areas with sandy soil or rock close to the surface. The types of counterpoises used are the continuous (parallel) type and the radial (crowfoot) type. The continuous (parallel) counterpoise consists of one or

more conductors buried under the transmission line for its entire length or under sections with high-resistance soils

The counterpoise wires are connected to the overhead ground (static wire) at all supporting structures. The radial-type counterpoise consists of several wires extending radially from the tower legs. The number and length of the wires will depend on the tower location and the soil conditions. The continuous counterpoise wires are usually installed with a cable plow at a depth of 18 inches or more. The wires should be deep enough so that they will not be disturbed by cultivation of the land.

DISTRIBUTION CIRCUIT GROUNDS

A multi-grounded neutral conductor for a primary distribution line is always connected to the substation grounding system where the circuit originates and is connected to all grounds along the length of the circuit. The primary neutral conductor must be continuous over the entire length of the circuit and should be grounded at intervals not to exceed 1/4 mile.

The primary neutral conductor can serve as a secondary neutral conductor. If separate primary and secondary neutral conductors are installed, the conductors should be connected together if the primary neutral conductor is effectively grounded.

- All equipment cases and tanks should be grounded.
- Lightning-arrester ground terminals should be connected to the common neutral, if available, and to a separate ground rod installed as close as is practical.
- Switch handles, down guys, and transformer secondaries must be properly grounded.
- The common conductor on the transformer secondary for a single-phase 120/240-volt service must be grounded.
- A three-phase delta- or open-delta-connected transformer secondary for 240- or 480-volt service would have the center tap of one of the transformer secondary terminals grounded.
- If the center tap of one of the transformer secondaries is not available, one-phase conductor is normally grounded.
- The neutral wire for three-phase, four-wire Y-connected secondaries for 208Y/120-volt or 480Y/277-volt service is grounded.
- If the primary circuit has an effectively grounded neutral conductor, the primary and secondary neutrals are connected together as well as to ground.

Many times, the primary distribution-line grounded neutral conductor is used for the secondary grounded neutral conductor and is called a common grounded neutral conductor. The neutral conductor of the service to the customer must be connected to ground on the customer's premises at the service-entrance equipment.

GROUND RODS

If the ground rod is driven to its full length and the ground resistance is above 25 ohms, resort to one of the following procedures:

- Extend the length of the rod.
- Drive additional rods.
- Treat the soil surrounding the rod with chemicals. When two or more driven rods are well spaced from each other and connected together, they provide parallel paths to the earth.
- They become, in effect, resistances in parallel or multiple and tend to follow the law of metallic parallel resistances.
- The rods are connected together with wire no smaller than that used to connect to the top of the pole.
- Multiple rods are commonly used for arrester grounds and for station and substation grounds.
- In addition to lowering the resistance, multiple rods provide higher current-carrying capacity and can thus handle larger fault currents.
- Driven grounds may be installed near the customer's service entrance to provide the required ground connection. Installing Driven Grounds.
- A galvanized-steel rod, stainless-steel rod, or copper weld rod is driven into the ground beside the pole at a distance of 2 ft.
- The rod should be driven until the top end is 2 ft below the ground level.
- After the rod is driven in place, connection is made with the ground wire from the pole.
- The actual connection to the ground rod is usually made with a heavy bronze clamp.
- The clamp is placed over the ground-rod end and the ground-wire end.
- The size of the ground wire should not be less than number 6 AWG copper wire.
- Number 4 wire is generally used.
- When the setscrew in the clamp is tightened, the ground wire is squeezed against the ground wire.
- Several precautions are taken in making the actual connection to minimize the possibility of the ground wire being pulled out by frost action or packing of the ground above it.
- The ground wire may be brought up through the clamp from the bottom.
- The wire is trained loosely so that there is plenty of slack between the ground-wire molding and the ground rod.

INSPECTIONS

At the beginning of each shift, the operator shall inspect and check the assigned equipment, reporting immediately to his/her supervisor any malfunction of the clutch or of the braking system, steering, lighting, or control system and locking/tagging out the equipment if necessary.

MAINTENANCE AND REPAIRS

Equipment Repair

Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.

Tire Safety

Tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar device.

ROLLING RAILROAD CARS

Derail and/or bumper blocks shall be provided on spur railroad tracks where a rolling car could contact other cars being worked, enter a building, work or traffic area.

BATTERIES

- Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.
- Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.
- Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.
- Floors shall be of acid resistant construction unless protected from acid accumulations.
- Face shields, aprons, and rubber gloves shall be provided for workers handling acids or batteries.
- Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.
- Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

Charging

- Battery charging installations shall be located in areas designated for that purpose.
- Charging apparatus shall be protected from damage by trucks.
- When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

TRAINING

- Only authorized employees shall be allowed to operate mobile equipment. Authorization to operate mobile equipment will be issued to employees qualifying under appropriate training and proficiency testing.
- Employees shall read and understand the operator's manual and the safe work procedures for each piece of equipment they will operate.
- Employees must be familiar with all safety regulations applicable to the equipment in use.
- The team member must first operate the equipment under the **direct** observation from the trainer or competent person.

Noise Exposure/Hearing Conservation

PURPOSE

The purpose of this document is to outline the Noise Exposure and Hearing Conservation Program for **Pacific Northwest Towers**; hereafter referred to as "The Company." Conservation of hearing is achieved through preventative measures. To reduce occupational hearing loss, all employees, who work in potentially noisy areas, are provided hearing protection, training and annual hearing tests. OSHA's hearing conservation standard is covered in 29 CFR 1910.95. Engineering controls are applied to reduce noise from equipment and operations.

RESPONSIBILITIES

Management

- Use Engineering and Administrative controls to limit employee exposure
- Provide adequate hearing protection for employees
- Post signs and warnings for all high noise areas
- Conduct noise surveys annually or when new equipment is added
- Conduct annual hearing tests for all employees
- Conduct hearing conservation training for all new employees
- Conduct annual hearing conservation training for all employees

Employees

- Use company provided, approved hearing protection in designated high noise areas
- Request new hearing protection when needed
- Exercise proper care of issues hearing protection

TRAINING

A training program shall be provided for all employees who are exposed to action level noise. The training shall be repeated annually for each employee. Training shall be updated consistent to changes in PPE and work processes. The Company will make available to affected employees, copies of the noise exposure procedures and shall also post a copy in the workplace. The Company shall also allow the Assistant Secretary and the Director access to records.

At time of hire and annually thereafter, all affected Employees must attend Hearing Conservation Training. The initial training is conducted as part of the New Hire Orientation Program by the Human Resource Department and consists of:

- Rules and procedures
- Where hearing protection is required
- How to use and care for hearing protectors
- How noise affects hearing and hearing loss

The company train each affected company employee who is exposed to noise at or above the action level of the Occupational Safety and Health Administration (OSHA) of 85 dBA as calculated as an eight-hour time weighted average (TWA) in the company's hearing conservation training program annually.

ENGINEERING CONTROLS

After it is determined that noise exposure above 85 dB(A) are present, engineering controls should be evaluated and implemented to reduce the noise exposure before administrative controls are initiated. Some examples of engineering controls include:

- Noise reducing baffles
- Compartmentalization
- Installing noise reducing gears
- Installing rubber pads under machinery

When new equipment or machinery are evaluated for purchase, the Safety Coordinator should be consulted to conduct an evaluation from a safety and health standpoint. One criteria of the evaluation should include the amount of noise the equipment will produce and how it will affect the overall noise exposure.

A continuing effective hearing conservation program shall be administered when employees are exposed to sound levels greater than 85 db (A) on an 8-hour time-weighted average basis.

ADMINISTRATIVE CONTROLS

After engineering controls are evaluated for effectiveness or feasibility, administrative controls should be considered to reduce noise exposure. Administrative controls include restricting exposure time or using personal protective equipment (PPE).

Personal Protective Equipment, such as ear plugs or muffs, may be used to reduce the amount of noise exposure. Each plug or muff has a noise reductions factor (NR) as evaluated by ANSI Standards (S3.19 - 1974 or Z24.22 - 1957). For example, if a work area has an ambient noise exposure of 96 dB (A), the hearing protectors should be rated 6 NR or better to be effective.

NOISE MONITORING

The Company shall develop and implement a monitoring program when information indicates that any company employee's exposure may equal or exceed an 8-hour time-weighted average (TWA) of 85 dBA. Factors which suggest that noise exposures in the workplace may be at this level include employee complaints about the loudness of noise, indications that employees are losing their hearing, or noisy conditions which make normal conversation difficult. The Company shall also consider any information available regarding noise emitted from specific machines.

In addition, actual workplace noise measurements can suggest whether or not a monitoring program should be initiated. 29 CFR 1910.95

Monitoring
Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

- Additional employees may be exposed at or above the action level or the attenuation (the number of decibels or amount of sound reduced) provided by hearing protectors being used by employees may be rendered inadequate

Hearing Conservation Amendment
The Hearing Conservation Amendment requires that when there are significant changes in machinery or production processes that may result in increased noise levels, re-monitoring must be conducted to determine whether additional employees need to be included in the hearing conservation program. Many companies choose to re-monitor periodically (once every year or two) to ensure that all exposed employees are included in their hearing conservation programs. 29 CFR 1910.95

Any employees exposed to noise at or above 85 dBA as an eight-hour time weighted average must be included in the company's hearing conservation program.

The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, The Company shall use representative personal sampling to comply with the monitoring requirements of this paragraph unless The Company can show that area sampling produces equivalent results.

All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements. Instruments used to measure employee noise exposure shall be calibrated to ensure measurement accuracy.

Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that additional employees may be exposed at or above the action level the attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements.

The Company shall evaluate the hearing protector attenuation for the specific noise environments in which the protector will be used.

AUDIOMETRIC TESTING/AUDIOGRAMS

The Occupational Safety and Health Administration's (OSHA) hearing conservation program is designed to protect workers that are exposed to occupational noise from suffering material hearing impairment.
OSHA requires that The Company shall establish and maintain audiometric testing program, which includes baseline audiograms, annual audiograms, training, and follow-up procedures, for workers exposed to significant occupational noise, even if they are subject to such noise exposures over their entire working lifetimes. Audiometric testing not only monitors the sharpness and acuity of an employee's hearing over time, but also provides an opportunity for The Company to educate employees about their hearing and the need to protect it.

Audiometric testing program provided at no cost to employees. 29 CFR 1910.95.

The two types of audiograms required in the hearing conservation program are **baseline** and **annual**. The baseline audiogram is the reference audiogram against which future (annual) audiograms are compared.

The essential elements of an audiometric testing program include:

- **Making audiometric testing available at no cost to all employees** who are exposed to an action level of 85 dB or above, measured as an 8-hour time weighted average (TWA). Hearing protectors shall be replaced at, no cost, as necessary.
- Having a licensed or certified audiologist (i.e., a specialist dealing with an individual having impaired hearing), an otolaryngologist (i.e., a physician specializing in the diagnosis and treatment of disorders of the ear, nose, and throat), or a physician responsible for the program.

An audiometric testing program will be established and maintained by making annual audiometric testing available to all employees whose exposures equal or exceed an 8-hr. time-weighted avg. 85 decibels. Within six months of a company employee's first exposure at or above the action level of 85 dBA as an eight-hour time weighted average (TWA), The Company shall establish a valid baseline audiogram against which subsequent audiograms can be compare. When a mobile van is used, the baseline shall be established within 1 yr.

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protection may be used to meet the requirement. Employees shall also be notified to avoid high levels of noise.

At least annually after obtaining the baseline audiogram, The Company will obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels. Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred.

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employee shall be informed of this fact in writing, within 21 days of the determination.

If a threshold shift has occurred, use of hearing protection shall be re-evaluated and/or refitted and if necessary, a medical evaluation may be required. This is done at no cost to employee(s). Hearing protection shall be replaced as necessary. The Company shall ensure that hearing protectors are worn. Employees shall be properly trained in the use, care and fitting of protectors.

The Company shall evaluate hearing protection for the specific noise environments in which the protector will be used. Accurate records of all employee exposure and audiometric measurements shall be maintained as required by the regulation.

Company employees shall be referred for a clinical audiological evaluation or an ontological examination, as appropriate, if additional testing is necessary or if the company suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.

Company employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.

Company employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

HEARING PROTECTORS

The Company shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees and replace as necessary. According to OSHA Regulations, each location with noise exposures of 85 to 89 dB (A) will provide hearing protectors for the Employee's optional use. Noise exposures at 90 dB (A) or above require the mandatory use of hearing protection. Further, OSHA requires that a variety of hearing protectors be available for Employees to choose (both a variety of plug and muff type hearing protectors).

TYPES OF HEARING PROTECTORS

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly. The most popular hearing protection devices are earplugs which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

USE OF HEARING PROTECTORS

Management, Supervision and Employees shall properly wear the prescribed hearing protectors while working in or traveling through any section of a Location that is designated a High Noise Area. (Excluding offices, break rooms, and rest facilities). The following rules will be enforced:

- Personal stereos, such as MP3 player, etc., will not be permitted in any operating area of company property.
- Hearing protectors, at least two types of plugs and one type of muffs, will be provided and maintained by Company
- Hearing protectors and replacements will be provided free of charge
- Hearing protectors will be properly worn at all times, except in offices, break rooms, rest facilities.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear which may increase your risk of developing infections.

Overhead and Gantry Crane Rigging

PURPOSE

The purpose of this document is to outline the Overhead and Gantry Crane and Hoist Program for **Pacific Northwest Towers;** hereafter referred to as "The Company." The Company policy is to maintain a safe workplace for its employees; therefore, only qualified and licensed individuals shall operate these devices. The safety rules and guidance in this program apply to all operations at The Company that involve the use of cranes and hoists installed in or attached to buildings and to all of The Company employees, supplemental labor, and subcontractor personnel who use such devices.

RESPONSIBILITIES

Supervisors

- Ensuring that employees under their supervision receive the required training and are certified and licensed to operate the cranes and hoists in their areas.
- Providing training for prospective crane and hoist operators. This training must be conducted by a qualified, designated instructor who is a licensed crane and hoist operator and a full-time employee.
- Evaluating crane and hoist trainees using the Crane Safety Checklist and submitting the Qualification Request Form to the Safety Office to obtain the operator's license.
- Ensuring that hoisting equipment is inspected and tested monthly by a responsible individual and that rigging equipment is inspected annually.

Crane and Hoist Operators

- Operating hoisting equipment safely.
- Conducting functional tests prior to using the equipment.
- Selecting and using rigging equipment appropriately.
- Having a valid operator's license on their person while operating cranes or hoists.
- Participating in the medical certification program, as required.

Engineering/Maintenance/Operations Department

- Performing annual maintenance and inspection of all cranes and hoists that are not covered by a program with maintenance responsibility.
- Conducting periodic and special load tests of cranes and hoists.
- Maintaining written records of inspections and tests, and providing copies of all inspections and test results to facility managers and building coordinators who have cranes and hoists on file.
- Inspecting and load testing cranes and hoists following modification or extensive repairs (e.g., a replaced cable or hook, or structural modification).

- Scheduling a non-destructive test and inspection for crane and hoist hooks at the time of the periodic load test and testing and inspecting before use new replacement hooks and other hooks suspected of having been overloaded. The evaluation, inspection, and testing may include, but are not limited to visual, dye penetrant, and magnetic particle techniques referenced in ASME B30.10 (Hooks, Inspection and Testing).
- Maintaining all manuals for cranes and hoists in a central file for reference.
- A preventive maintenance program based upon the crane manufacturer's recommendations shall be established.

Safety Officer

- Conducting training for all Crane and Hoist Operators.
- Issuing licenses to Crane and Hoist Operators.
- Periodically verifying monthly test and inspection reports.
- Interpreting crane and hoist safety rules and standards.

POLICY

All workers who use any of The Company crane or hoists shall have an operator's license. The Company issues licenses for authorized employees who have been specifically trained in crane and hoist operations and equipment safety.

CRANE AND HOIST OPERATORS

Only designated personnel shall be allowed to operate this equipment, and all operators will be trained in safe work standards.

To be qualified as a Crane and Hoist Operator, the candidate shall have received hands-on training from a licensed, qualified crane and hoist operator designated by the candidate's supervisor. Upon successful completion of training, the licensed crane and hoist operator and the candidate's supervisor will fill out and sign the Qualification Request Form and Crane Safety Checklist and send them to the Safety Office for approval. The candidate will be issued a license upon approval by the Safety Manager. Crane and Hoist Operators must renew their license every three years by satisfying the requirements described above.

Only those employees qualified by training or experience shall be allowed to operate equipment and machinery. By November 10th 2017, operators shall be qualified/certified by one of the following methods:

- Certification by an accredited crane operator testing organization
- Qualification by an audited employer program
- Qualification by the U.S. military
- Licensing by a government entity

CRANE AND HOIST SAFETY DESIGN REQUIREMENTS

Following are the design requirements for cranes and hoists and their components:

- The design of all commercial cranes and hoists shall comply with the requirements of ASME/ANSI B30 standards and Crane Manufacturer's Association of America standards (CMAA-70 and CMAA-74). Pacific Northwest Towers-fabricated lifting equipment shall comply with the requirements in Chapter 2.2 (Lifting Equipment) of Mechanical Engineering *Design Safety Standards* (latest edition).
- All crane and hoist hooks shall have safety latches.
- Hooks shall not be painted (or re-painted) if the paint previously applied by the manufacturer is worn.
- Crane pendants shall have an electrical disconnect switch or button to open the main-line control circuit.
- Cranes and hoists shall have a main electrical disconnect switch. This switch shall be in a separate box that is labeled with lockout capability.
- Crane bridges and hoist monorails shall be labeled on both sides with the maximum capacity.
- Each hoist-hook block shall be labeled with the maximum hook capacity.
- Directional signs indicating N-W-S-E shall be displayed on the bridge underside, and a corresponding directional label shall be placed on the pendant.
- A device such as an upper-limit switch or slip clutch shall be installed on all building cranes and hoists. A lower-limit switch may be required when there is insufficient hoist rope on the drum to reach the lowest point.
- All cab and remotely operated bridge cranes shall have a motion alarm to signal bridge movement.
- All newly installed cranes and hoists, or those that have been extensively repaired or rebuilt structurally, shall be load tested at 125% capacity prior to being placed into service.
- If an overload device is installed, a load test to the adjusted setting is required.

GENERAL SAFETY RULES

Operators shall comply with the following rules while operating the cranes and hoists:

- Do not engage in any practice that will divert your attention while operating the crane.
- Respond to signals only from the person who is directing the lift or any appointed signal person. Obey a stop signal at all times, no matter who gives it.
- Do not move a load over people. People shall not be placed in jeopardy by being under a suspended load. Also, do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight. Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.

- Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded. Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight.
- Check that all controls are in the OFF position before closing the main line disconnect switch.
- If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire.
- Avoid side pulls. These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.
- To prevent shock loading, avoid sudden stops or starts. Shock loading can occur when a suspended load is accelerated or decelerated and can overload the crane or hoist. When completing an upward or downward motion, ease the load slowly to a stop.
- Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer’s specifications for adequate support and degree of level of the equipment are met.
- The manufacturer's procedures and prohibitions must be complied with when assembling and disassembling equipment.
- The assembly/disassembly of equipment must be directed by a competent and qualified person.
- The work zone shall be identified by demarcating boundaries such as flag and range limiting devices, or defining the work zone as 360 degrees around the equipment up to the maximum working radius. The hazard assessment must determine if any part of the equipment could get closer than 20 feet to a power line.
- All manufacturer procedures applicable to the operational functions of equipment, including its use with attachments, must be complied with.

OPERATION RULES

The operator shall have access to procedures applicable to the operation of the equipment. Procedures include rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions and operator's manual.

Whenever there is a safety concern, the operator is granted the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

The Safety Officer or competent person available on the worksite shall identify hazard areas by marking the boundaries of the crane swing radius with warning lines, railings or similar barriers. Workers within proximity of the operational equipment shall not stand or work within this safety boundary or at any place where the potential to be struck by, pinched or crushed by the equipment or other related moving parts.

PRE-OPERATIONAL TEST

At the start of each work shift, operators shall do the following steps before making lifts with any crane or hoist:

- Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips.
- Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.
- If provided, test the lower-limit switch.
- Test all direction and speed controls for both bridge and trolley travel.
- Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.
- Test the pendant emergency stop.
- Test the hoist brake to verify there is no drift without a load.
- If provided, test the bridge movement alarm.
- Lock out and tag for repair any crane or hoist that fails any of the above tests.

If it is determined that any part of the equipment, load line or load could get closer than 20 feet to a power line then at least one of the following measures must be taken:

- Ensure the power lines have been de-energized and visibly grounded
- Ensure no part of the equipment, load line or load gets closer than 20 feet to the power line
- Determine the line's voltage and minimum approach distance permitted in Table A

MOVING A LOAD

- Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted. Inspect the drum to verify that the cable is in the grooves.
- Use a tag line when loads must traverse long distances or must otherwise be controlled. Manila rope may be used for tag lines.
- Plan and check the travel path to avoid personnel and obstructions.
- Lift the load only high enough to clear the tallest obstruction in the travel path.
- Start and stop slowly.
- Land the load when the move is finished. Choose a safe landing.
- *Never* leave suspended loads unattended. In an emergency where the crane or hoist has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides. Lock open and tag the crane or hoist's main electrical disconnect switch.

PARKING A CRANE OR HOIST

- Remove all slings and accessories from the hook. Return the rigging device to the designated storage racks.
- Raise the hook at least 2.1 m (7-ft) above the floor.
- Store the pendant away from aisles and work areas or raise it at least 2.1 m (7 ft) above the floor.

RIGGING

General Rigging Safety Requirements

The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground or floor. The rated load marking on a hoist must be located and arranged so that it is evident to the personnel responsible for the safe operation of the hoisting unit.

Only select rigging equipment that is in good condition. All rigging equipment shall be inspected annually; defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. The load capacity limits shall be stamped or affixed to all rigging components.

The Company policy requires a minimum safety factor of 5 to be maintained for wire rope slings. The following types of slings shall be rejected or destroyed.

Nylon slings with:

- Abnormal wear.
- Torn stitching.
- Broken or cut fibers.
- Discoloration or deterioration.

Wire-rope slings with:

- Kinking, crushing, bird caging, or other distortions.
- Evidence of heat damage.
- Cracks, deformation, or worn end attachments.
- Six randomly broken wires in a single rope lay.
- Three broken wires in one strand of rope.
- Hooks opened more than 15% at the throat.
- Hooks twisted sideways more than 10deg. from the plane of the unbent hook.

Alloy steel chain slings with:

- Cracked, bent, or elongated links or components.
- Cracked hooks.

- Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed.

Rigging a Load

Do the following when rigging a load:

- Determine the weight of the load. Do not guess.
- Determine the proper size for slings and components.
- Do not use manila rope for rigging.
- Make sure that shackle pins and shouldered eyebolts are installed in accordance with the manufacturer's recommendations.
- Make sure that ordinary (shoulder less) eyebolts are threaded in at least 1.5 times the bolt diameter.
- Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- Pad sharp edges to protect slings. Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- Do not use slings, eyebolts, shackles, or hooks that have been cut, welded, or brazed.
- Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.
- Determine the center of gravity and balance the load before moving it.
- Initially lift the load only a few inches to test the rigging and balance.

CRANE OVERLOADING

Cranes or hoists shall not be loaded beyond their rated capacity for normal operations. Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

WORKING AT HEIGHTS ON CRANES AND HOISTS

Anyone conducting maintenance or repair on cranes or hoists at heights greater than 1.8 m (6 ft) shall use fall protection. Fall protection should also be considered for heights less than 1.8 m. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building or properly secured safety nets.

Use of a crane as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible. Workers shall not ride a moving

bridge crane without an approval from the Safety Office, which shall specify the following as a minimum:

- Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged open.
- Personnel shall not use bridge cranes without a permanent platform (catwalk) as work platforms. Bridge catwalks shall have a permanent ladder access.
- Personnel shall ride seated on the floor of a permanent platform with approved safety handrails, wear safety harnesses attached to designated anchors, and be in clear view of the crane operator at all times.
- Operators shall lock and tag open the main (or power) disconnect switch on the bridge catwalk when the crane is parked.

HAND SIGNALS

A signal person shall be provided anytime the operator's view is obstructed, if site specific safety concerns require it, or if the operator determines that it is necessary.

The signal person must also be provided for the following situations:

- The point of operation is not in full view of the operator
- The view is obstructed when the equipment is traveling
- The operator or the person handling the load determines it is necessary due to site specific concerns

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio, or equivalent) is used. Signals shall be discernible or audible at all times. Some special operations may require addition to or modification of the basic signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator and shall not be in conflict with the standard signals.

INSPECTION, MAINTANENCE, AND TESTING

A competent person must conduct a visual inspection of equipment prior to each shift. The inspection must consist of observation for apparent deficiencies. Some inspection items shall include control mechanisms, pressurized lines, hooks and latches, wire rope, electrical apparatus, tires (when used), and ground conditions. All tests and inspections shall be conducted in accordance with the manufacturer's recommendations.

Monthly inspection records shall be made and kept on critical items in use such as brakes, crane hooks, and ropes.

Written reports shall be made and maintained on rated load tests showing the test procedures and confirming the adequacy of any repairs or alterations.

IDLE ROPE

All rope which has been idle for a period of a month or more due to shut down or storage of a crane on which it is installed shall be given a thorough inspection before it is used. This inspection shall be for all types of deterioration and shall be performed by an appointed or authorized person whose approval shall be required for further use of the rope.

MONTHLY TESTING

Equipment must be inspected monthly by a competent person. The inspection must be documented. Documentation must include the following:

- Items Checked.
- Results of Inspection.
- Name and Signature of the inspector.
- Rope inspection shall be performed once a month and certify the date, signature of person performing the inspection.
- Rope inspection shall be performed once a month and certify the date, signature of person performing the inspection.

Monthly inspection must be conducted, and records must be kept of all hooks with deformation or cracks. The certification records must include

- Date of inspection.
- Signature of person performing inspection.
- The serial number or other identifier of hook inspected.

Employers must make a monthly inspection and keep a record of hoist chains (including end connections) for:

- Excessive wear,
- Twist,
- Distorted links interfering with proper function, and
- Stretch beyond manufacturer's recommendation. The certification records must include:
  - Date of inspection,
  - Signature of person performing inspection
  - Identifier of chain inspected.

Documentation must be retained for 3 months.

Defective cranes and hoists shall be locked and tagged "out of service" until all defects are corrected. The inspector shall initiate corrective action by notifying the facility manager or building coordinator.

ANNUAL INSPECTIONS

The Safety Department shall schedule and supervise (or perform) annual preventive maintenance (PM) and annual inspections of all cranes and hoists. The annual PM and inspection shall cover:

- Hoisting and lowering mechanisms;
- Trolley travel or monorail travel;
- Bridge travel;
- Limit switches and locking and safety devices;
- Structural members;
- Bolts or rivets;
- Sheaves and drums;
- Parts such as pins, bearings, shafts, gears, rollers, locking devices, and clamping devices;
- Brake system parts, linings, pawls, and ratchets;
- Load, wind, and other indicators over their full range;
- Gasoline, diesel, electric, or other power plants;
- Chain-drive sprockets;
- Crane and hoist hooks;
- Electrical apparatus such as controller contractors, limit switches, and push button stations;
- Wire rope;
- Hoist chains.

Safety devices are required to be on all equipment and must be in proper working order before operations begin. If any of the devices are not in proper working order the equipment must be taken out of service and operations must not resume until the device is working properly again. Examples of safety devices may include crane level indicator, boom stops, jib stops, foot pedal brake locks, horns, etc.

LOAD TESTING

- Newly installed cranes and hoists shall be load tested at 125% of the rated capacity by designated personnel.
- Slings shall have appropriate test data when purchased. It is the responsibility of the purchaser to ensure that the appropriate test data are obtained and maintained.
- Re-rated cranes and hoists shall be load tested to 125% of the new capacity if the new rating is greater than the previous rated capacity.
- Fixed cranes or hoists that have had major modifications or repair shall be load tested to 125% of the rated capacity.
- Cranes and hoists that have been overloaded shall be inspected prior to being returned to service.

- Personnel platforms, baskets, and rigging suspended from a crane or hoist hook shall be load tested initially, then re-tested annually thereafter or at each new job site.
- All cranes and hoists with a capacity greater than 2722 kg (3 tons) should be load tested every four years to 125% of the rated capacity. Cranes and hoists with a lesser capacity should be load tested every eight years to 125% of the rated capacity.
- All mobile hoists shall be load tested at intervals to be determined by The Company will keep and maintain certification record(s) which include the date(s) of inspection and the signature of person(s) who performed inspection. The same records must be kept on inspections of all other ropes.
- Whenever any sling is used specific safety practices shall be observed.
- Each sling shall be inspected before being used.
- Each sling, fastenings, and all attachments shall be inspected by a designated competent person by the employer.

EXTINGUISHERS

A CO2 or dry chemical fire extinguisher shall be kept in the crane cab or vicinity of the crane.

REPAIR

Prior to any maintenance commencing on an overhead or gantry crane, proper Lockout/Tagout procedures must be followed by an authorized person and out of order signs placed on or near the equipment.

WORKING NEAR OVERHEAD LINES

Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact under normal operating conditions.

MODIFICATIONS

The manufacturer must approve all modifications/additions in writing. A registered professional engineer must be qualified with respect to the equipment involved and must ensure the original safety factor of the equipment is not reduced.

RECORDS

The Safety Department shall maintain records for all cranes, hoist and rigging equipment.

Radio Frequency/EME

PURPOSE

This program provides the minimum safety requirements for protecting employees from potential injuries associated with Radio Frequencies (RF) above 300 kHz. By following these basic safety principles and maintaining proper safety awareness, employees should be able to avoid serious injury or illness.

The purpose of this program is to provide employees with the basic information for assuring a safe and healthful workplace free from recognized radio frequency hazards, which may cause injury or illness. Each employee is expected to follow the guidelines provided within this program. Supervisors shall be responsible for initiating disciplinary action against employees who do not follow the guidelines within this program.

Electromagnetic radiation consists of waves of electric and magnetic energy moving together (i.e., radiating) through space at the speed of light. Taken together, all forms of electromagnetic energy are referred to as the electromagnetic "spectrum." Radio waves and microwaves emitted by transmitting antennas are one form of electromagnetic energy. They are collectively referred to as "radiofrequency" or "RF" energy or radiation. Often the term "electromagnetic field" or "radio frequency field" may be used to indicate the presence of electromagnetic or RF energy.

Different forms of electromagnetic energy are categorized by their wavelengths and frequencies. The RF part of the electromagnetic spectrum is generally defined as that part of the spectrum where electromagnetic waves have frequencies in the range of about 3 kilohertz (3 kHz) to 300 gigahertz (300 GHz). Microwaves are a specific category of radio waves that can be defined as radiofrequency energy where frequencies range from several hundred MHz to several GHz. The information in this program applies to all employees working on or near, 800 MHz towers or antennas and associated equipment. See Appendix A for Electromagnetic spectrum diagram.

The energy levels associated with RF and microwave radiation are not great enough to cause the ionization of atoms and molecules. Other types of non-ionizing radiation include visible light, infrared radiation, and other forms of electromagnetic radiation, which also have relatively low frequencies. Often the term "radiation" is used to apply to ionizing radiation such as that associated with nuclear power plants. Ionizing radiation should not be confused with the lower-energy, non-ionizing radiation with respect to possible biological effects because the mechanisms of action are quite different.

"Ionization" is a process by which electrons are stripped from atoms and molecules. This process can produce molecular changes that can lead to damage in biological tissue, including effects on DNA, the genetic material. This process requires interaction with high levels of electromagnetic

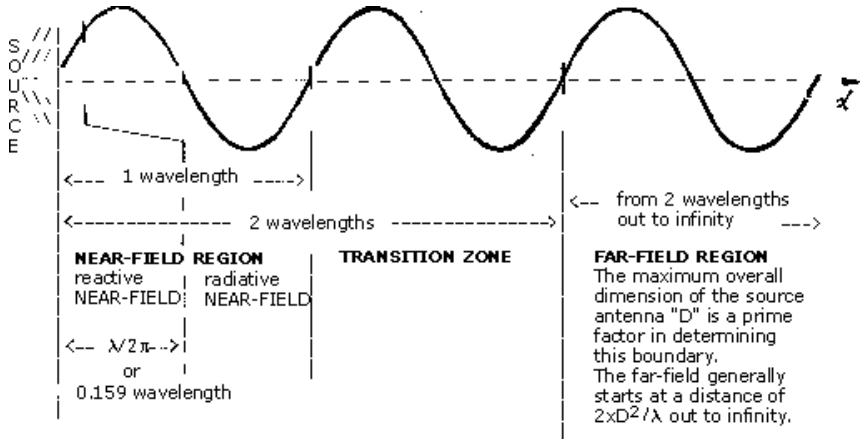
energy. Those types of electromagnetic radiation with enough energy to ionize biological material include X-radiation and gamma radiation. Therefore, X-rays and gamma rays are examples of ionizing radiation.

Radio frequencies constitute part of the overall electromagnetic spectrum. Cellular radio services transmit using frequencies between 800 and 900 megahertz (MHz). It should be noted that The Company radio towers are operating on the 800 MHz level and all are gated and locked and have proper signage attached. In addition, these antennas are located on the outside of the building and are pointed outward, which further limits access.

Certain behavior characteristics of Electromagnetic (EM) fields dominate at one distance from the radiating antenna, while a completely different behavior can dominate at another location. Electrical engineers define boundary regions to categorize behavior characteristics of electromagnetic fields as a function of distance from the radiating source. These regions are the "Near-Field," "Transition Zone," and "Far-Field." The regional boundaries are usually measured as a function of the wavelength. Figure 1 shows these regions and boundaries.

Two things should be stressed: these regions categorize behaviors, which vary even within each region; and the boundaries for these regions are approximate "rules of thumb" (more precise boundaries can be defined based primarily on antenna type and antenna size).

All The Company radio towers and antennas are so situated and secured as to keep people in the category I location under the ANSI standard (Please note: Information was not obtained from the Division of Aviation Operations). Category I locations are areas where the RF fields are too weak to cause exposures greater than the FCC general population (public) limits.



RESPONSIBILITIES

Management shall be responsible for the implementation and enforcement of all aspects of the program. Duties are as follows:

- Ensure compliance with this program
- Conduct immediate corrective action for deficiencies found in the program
- Make this plan available to employees or their designated representative(s)
- Initially evaluate RF sources
- Maintain RF source inventory
- Evaluate safety procedures
- Evaluate existing RF safety program documentation
- Disseminate RF safety policy
- Provide authoritative advice
- Review/authorize RF surveys and control measures
- Authorize designated RF safety personnel
- Coordinate RF safety awareness
- Arrange/conduct regular site audits
- Conduct annual RF hazard survey policies and procedures review
- Manage policy and procedures breaches, including accidental over exposure incidents
- Develop/approve RF hazard assessment
- Arrange for regular survey/monitoring equipment calibration
- Ensure proper documentation control and central archiving

POLICY

Biological effects can result from animal or human exposure to RF energy. Biological effects that result from heating of tissue by RF energy are often referred to as "thermal" effects.

It has been known for many years that exposure to very high levels of RF radiation can be harmful due to the ability of RF energy to heat biological tissue rapidly. This is the principle by which microwave ovens cook food.

Exposure to very high RF intensities can result in heating of biological tissue and an increase in body temperature. Tissue damage in humans could occur during exposure to high RF levels because of the body's inability to cope with or dissipate the excessive heat that could be generated.

Two areas of the body, the eyes and the testes, are particularly vulnerable to RF heating because of the relative lack of available blood flow to dissipate the excessive heat load.

At relatively low levels of exposure to RF radiation, (i.e., levels lower than those that would produce significant heating) the evidence for production of harmful biological effects is ambiguous and unproven.

Exposure
The exposure limits used by the FCC are expressed in terms of Specific Absorption Rate (SAR), electric and magnetic field strength, and power density for transmitters operating at frequencies from 300 kHz to 100 GHz.

SAR is the rate of energy absorption in tissue, measured in watts per kilogram of tissue. Limits incorporate a safety factor of 10 (Most Western Limits are 0.4 W/kg).

The exposure limits used by OSHA 1926.54(l) are as follows: Employees shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.

Controlled environment for RF purposes is an area where human activity is subject to control and accountability as established by a written RF Safety Program.

Occupational limits (see Table 1) apply to persons who are exposed as a consequence of their employment and those persons have been made fully aware of the potential for exposure and can exercise control over their exposure (designated as RF Safety Trained).

Table 1 - Exposure Limits for Occupational Controlled Exposure

Frequency Range (MHz)	Electrical Field Strength (V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Average Time Minutes
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

F = frequency in MHz * = Plane – wave equivalent power density

Table 2 - Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electrical Field Strength (V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Average Time Minutes
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/150	30
1500-100,000	--	--	1.0	30

***Note to Table 1**: Occupational/Controlled limits apply in situations in which persons exposed as a consequence of their employment are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled limits apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

***Note to Table 2**: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential of exposure or cannot exercise control over their exposure. People in this group include the general public not associated with the installation and maintenance of the transmitting equipment.

(Taken from FCC 96-326 Guidelines for Evaluating the Environmental Effects of Radiofrequency radiation ET Docket No. 93-62)

Ancillary Hazards
It should be noted that these additional hazards may exist at these locations and/or under these situations:

- Electric shock
- Ionizing Radiation
- Mechanical/Eye Hazards
- Fall from heights and/or through openings
- Confined Space
- Trip Hazards
- Welding/cutting operations
- Heat stress
- Toxic chemicals/gases
- Cooling refrigerants
- Optical Radiation sources

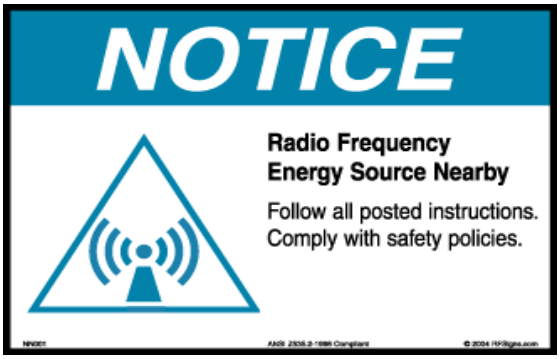
Program Elements

- Identification and inventorying of exposure sources
- Potential hazards
- Characterization of sources
- Ancillary hazards consideration/evaluation
- Suitable control application
- Training for potentially exposed individuals as well as for the RF Safety Officer

Signs

Per OSHA, "the RF hazard areas shall be clearly marked with appropriate signs, barricades, etc., such that any worker who has access to the facility will be alerted not to occupy the hazardous location.

- Signs shall be of standard design with shape meeting ANSI C95.1 (see Appendix B for placement)
- Signs shall be of sufficient size to be recognizable and readable from not less than 25 feet away.
- Signs shall be placed where there is a potential for exposure that might exceed occupational limits. See Table 1.
- Signs shall be placed anywhere exposure limits might exceed public limits. See Table 2.
- Signs shall be placed anywhere equipment is in use and under normal operation and maintenance and where there are no public or occupational exposure issues.



ANSI Standard Z535.1-1998 'Safety Blue' for the background color of the signal word on NOTICE signs indicating a statement of company policy.

ANSI Standard Z535.1-1998 'Safety Yellow' for the background color of the signal word on CAUTION signs indicating a potentially hazardous situation.

Medical Surveillance

A medical exam is appropriate for "accidental" exposures defined as an exposure above trigger levels identified in Tables 1 & 2. Symptoms of accidental exposure can be described as but not limited to the following: immediate sensation of intense heating of the parts of the body in the electromagnetic field followed by a variety of symptoms and signs, including pain, headache, numbness, and paresthesia (tingling, numbness, itching), malaise, diarrhea, and skin erythema.

Medical surveillance will consist of an annual medical evaluation by a licensed healthcare professional which must contain a means to report the occurrence of RF burns, implanted medical devices (e.g., copper IUD), or the sensation of non-routine heating as a means of identifying potential problem areas.

Annual Program Review

An annual check of all RF facilities must be completed in order to ensure changes have not occurred over the past year. Periodic RF screening measurements are not necessary at the present time due to the configuration of The Company RF sources.

Training Requirements

All affected employees will be trained on radio frequency safety on initial assignment followed by refresher training on a periodic basis. The training will consist of the information contained within this procedure. RF safety and health training will be conducted to ensure that all employees understand the RF hazard to which they are exposed and the means by which the hazard can be controlled. Retraining and/or periodic refresher will be conducted when warranted by an incident or other evidence of the employee's lack of understanding or compliance with the program.

Awareness Training

Awareness Training is for "all persons" with access to areas where RF exposure may exceed applicable limits (commensurate with exposure situation). All employees/contractors are required to go through awareness training.

Training Program Elements

- Introduction to RF sources licensed by The Company and RF Safety (RF generation, propagation, transmission, antennas, etc.)
- Discussion of biological effects/hazards
- Explanation of standards/regulations and basis for them
- Information about potential excessive exposure situations and their controls
- RF safety program elements
- Instruction on how to respond to over-exposure incidents
- Information about potential RF susceptibility of medical devices/implants
- Additional information sources
- Personal monitoring vs. area monitoring
- Lock out tag out

Fully Aware Training

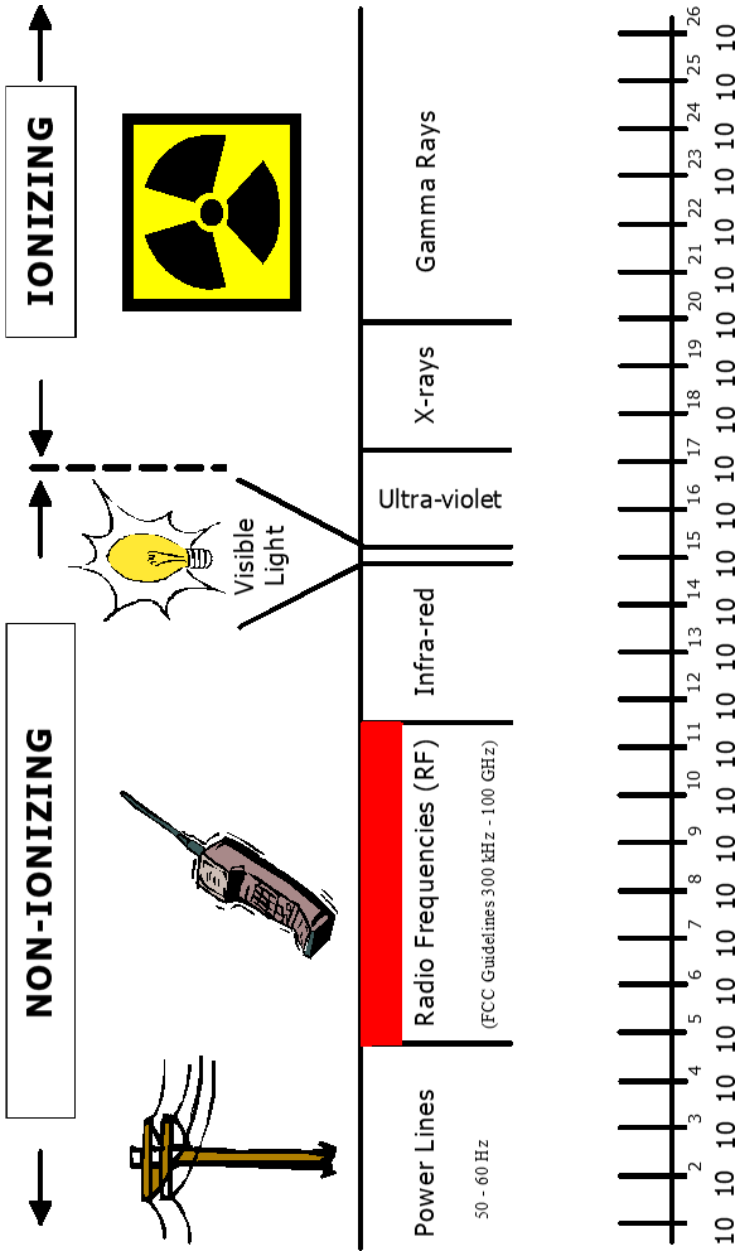
Fully Aware Training is for "all persons" working on or in proximity (roof-mounted antennas) to areas where RF exposure may exceed applicable limits (commensurate with exposure situation [See Table 1]). Trainees will receive written and verbal information about how to control or mitigate radiation exposures.

Training Program Elements

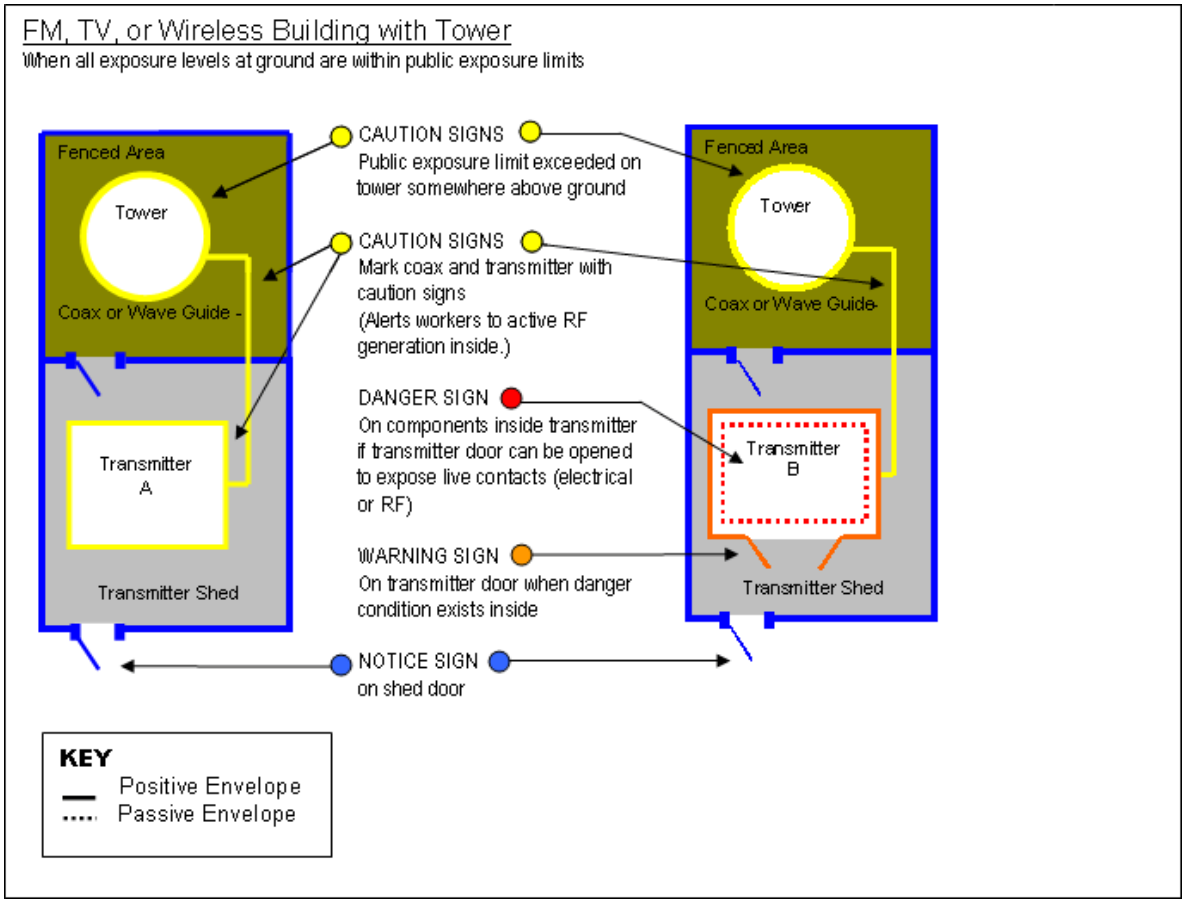
- Introduction to RF sources licensed by The Company and RF Safety (RF generation, propagation, transmission, antennas, etc.)
- Discussion of biological effects/hazards
- Explanation of standards/regulations and basis for them
- Information about potential excessive exposure situations and their controls
- RF safety program elements
- Instruction on how to respond to over-exposure incidents
- Information about potential RF susceptibility of medical devices/implants
- PPE training – donning, doffing, inspection
- How to use administrative and engineering controls to reduce exposure levels

APPENDIX A

RFR Basics: The Electromagnetic Spectrum

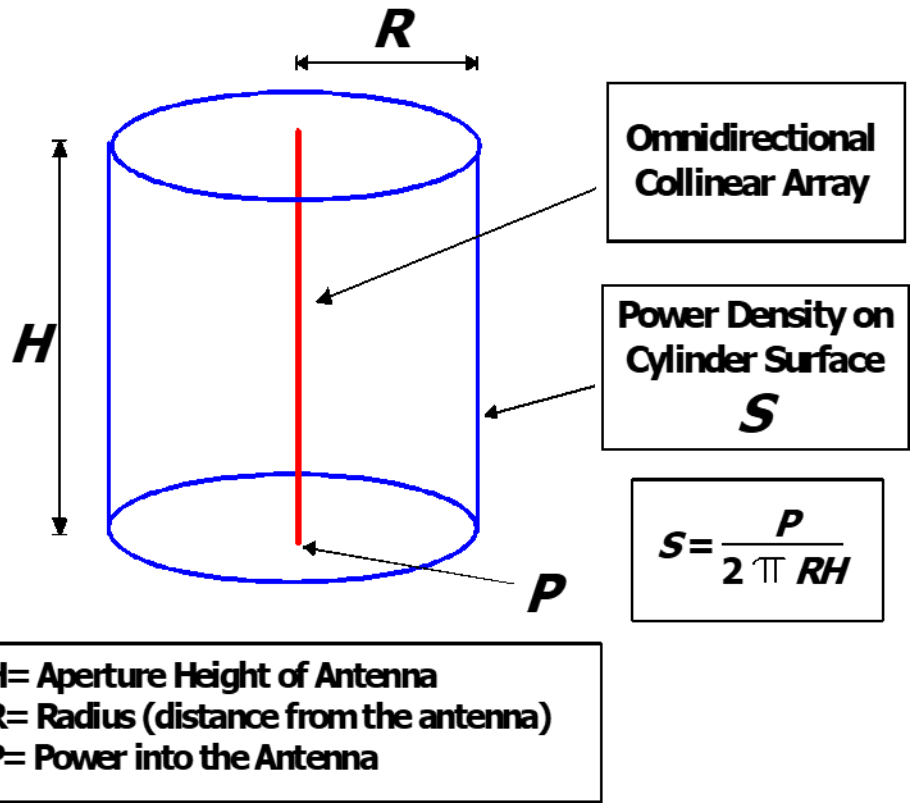


APPENDIX B


FM, TV, or Wireless Building with Tower
When all exposure levels at ground are within public exposure limits
Fenced Area
Tower
Coax or Wave Guide
Transmitter A
Transmitter Shed
CAUTION SIGNS
Public exposure limit exceeded on tower somewhere above ground
CAUTION SIGNS
Mark coax and transmitter with caution signs
(Alerts workers to active RF generation inside.)
DANGER SIGN
On components inside transmitter if transmitter door can be opened to expose live contacts (electrical or RF)
WARNING SIGN
On transmitter door when danger condition exists inside
NOTICE SIGN
on shed door
Fenced Area
Tower
Coax or Wave Guide
Transmitter B
Transmitter Shed
KEY
Positive Envelope
Passive Envelope

APPENDIX C

Cylindrical Model



Rigging Material Handling

PURPOSE

The purpose of this document is to outline the Rigging Material Handling Program for **Pacific Northwest Towers**; hereafter referred to as "The Company."

RESPONSIBILITIES

Management

- Implement the requirements of this program
- Determine appropriate implementation (legislative applicability) and enforcement of this program
- Train employees on this program or select an outside training facility

Employees

- Follow the provisions set forth in this program

POLICY

General

Only persons who are deemed competent or qualified (by experience and training) shall attach any loads to a lifting device and only competent or qualified operators shall operate a crane while engaged in lifting operations.

TRAINING

All affected employees shall demonstrate competency and qualifications through training based upon the following objectives:

- Proper hardware selections such as hooks, bolts, eye bolts, ropes, chains, slings etc. that is appropriate for the task at hand;
- Inspection of equipment prior to use;
- Safe methods of load connection/hook-up;
- How to safely secure each load (attaching, lifting, guiding the load while elevated, load lowering and placement.

RIGGING MATERIAL HANDLING

- Defective equipment shall not be used and must be removed from service immediately.
- Rigging equipment shall not be loaded beyond its recommended safe working load. Identification markings, indicating rated capacity for the type(s) of hitch(es) used,

the angle upon which it is based, and the number of legs if more than one, shall be permanently affixed to the rigging.
- Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees.
- Tag lines shall be used unless their use creates an unsafe condition.
- Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.
- All employees shall be kept clear of loads about to be lifted and of suspended loads.

INSPECTION

Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by The Company.

Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

Alloy Steel Chains

- Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.
- Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.
- Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall not be used.

The Company will not use alloy steel-chain slings with loads in excess of the rated capacities (i.e., working load limits) indicated on the sling by permanently affixed and legible identification markings prescribed by the manufacturer.

Whenever wear at any point of any chain link exceeds that shown in **Table H1**, the assembly shall be removed from service.

In addition to the inspection required by other paragraphs of this section, a thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of:
- Frequency of sling use;
- Severity of service conditions;
- Nature of lifts being made; and,
- Experience gained on the service life of slings used in similar circumstances.

Such inspections shall in no event be at intervals greater than once every 12-months.

The employer shall make and maintain a record of the most recent month in which each alloy steel chain sling was thoroughly inspected and shall make such record available for examination.

Wire Rope

The Company will not use improved plow-steel wire rope and wire-rope slings with loads in excess of the rated capacities (i.e., working load limits) indicated on the sling by permanently affixed and legible identification markings prescribed by the manufacturer.

- Protruding ends of strands in splices on slings and bridles shall be covered or blunted.
- Wire rope shall not be secured by knots, except on haul back lines on scrapers.

The following limitations shall apply to the use of wire rope:

- An eye splice made in any wire rope shall have not less than three full tucks. However, this requirement shall not operate to preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.
- Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, shall consist of one continuous piece without knot or splice.
- Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire rope clips or knots.
- Wire rope shall not be used if, in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.
- When U-bolt wire rope clips are used to form eyes, **Table H2** shall be used to determine the number and spacing of clips.
- When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.
- Slings shall not be shortened with knots or bolts or other makeshift devices.
- Sling legs shall not be kinked.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Slings shall be padded or protected from the sharp edges of their loads.
- Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- Shock loading is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling.

Rigging equipment for material handling shall be inspected prior to use on each shift, and as necessary during its use to ensure that it is safe.

- Rigging equipment for material handling shall be inspected prior to use on each shift

and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

The Company will ensure that rigging equipment:

- Has permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load;
- Not be loaded in excess of its recommended safe working load as prescribed on the identification markings by the manufacturer; and
- Not be used without affixed, legible identification markings.

Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.

SCOPE

This section applies to slings used in conjunction with other material handling equipment for the movement of material by hoisting, in employments covered by this part. The types of slings covered are those made from **alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).**

SLINGS

Minimum Sling Lengths

- Cable laid and 6 X 19 and 6 X 37 slings shall have minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves or end fittings.
- Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.
- Cable laid grommets, strand laid grommets and endless slings shall have a minimum circumferential length of 96 times their body diameter.

Safe Operating Temperatures

Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 deg. F (93.33 deg. C).

When non-fiber core wire rope slings of any grade are used at temperatures above 400 deg. F (204.44 deg. C) or below minus 60 deg. F (15.55 deg. C), recommendations of the sling manufacturer regarding use at that temperature shall be followed.

End Attachments

Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.

All welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their rated capacity prior to initial use. The employer shall retain a certificate of proof test and make it available for examination.

Wire rope slings shall have permanently affixed, legible identification markings stating size, rated capacity for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs (if more than one).

Wire rope slings shall not present a hazard to employees.

NATURAL ROPE AND SYNTHETIC FIBER

Employers must not use natural- and synthetic-fiber rope slings with loads in excess of the rated capacities (i.e., working load limits) indicated on the sling by permanently affixed and legible identification markings prescribed by the manufacturer.

All splices in rope slings provided by the employer shall be made in accordance with fiber rope manufacturers recommendations.

In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the center line of the splice).

In layered synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the center line of the splice).

Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1-inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes 1-inch diameter and larger, the tails shall project at least 6 inches beyond the last full tuck. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60 deg. at the splice when the eye is placed over the load or support.

Knots shall not be used in lieu of splices.

Safe Operating Temperatures

Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20 deg. F (-28.88 deg. C) to plus 180 deg. F (82.2 deg. C) without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

Splicing

Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.

In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.
Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under 1 inch (2.54 cm) in diameter, the tail shall project at least six rope diameters beyond the last full tuck. For fiber rope 1 inch (2.54 cm) in diameter and larger, the tail shall project at least 6 inches (15.24 cm) beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.

Knots shall not be used in lieu of splices.

Clamps not designed specifically for fiber ropes shall not be used for splicing.

For all eye splices, the eye shall be of such size to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.

End Attachments

Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

Removal from Service

Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

- Abnormal wear;
- Powdered fiber between strands;
- Broken or cut fibers;
- Variations in the size or roundness of strands;
- Discoloration or rotting;
- Distortion of hardware in the sling.

Employers must use natural- and synthetic-fiber rope slings that have permanently affixed and legible identification markings that state the rated capacity for the type(s) of hitch(es) used and the angle upon which it is based, type of fiber material, and the number of legs if more than one.

Synthetic Webbing (Nylon, Polyester, and Polypropylene)
The employer shall have each synthetic web sling marked or coded to show:

- Name or trademark of manufacturer;
- Rated capacities for the type of hitch;
- Type of material;
- Rated capacity shall not be exceeded.

WEBBING

Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

FITTINGS

Fittings shall be: Of a minimum breaking strength equal to that of the sling; and, free of all sharp edges that could in any way damage the webbing.

Attachment of end fittings to webbing and formation of eyes Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

Environmental Conditions
When synthetic web slings are used, the following precautions shall be taken:

- Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.
- Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.
- Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

Safe Operating Temperatures

Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 deg. F (82.2 deg. C). Polypropylene web slings shall not be used at temperatures in excess of 200 deg. F (93.33 deg. C).

Removal From Service

Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

- Acid or caustic burns;
- Melting or charring of any part of the sling surface;
- Snags, punctures, tears or cuts;
- Broken or worn stitches; or
- Distortion of fittings.
- Shackles and hooks.

The Company will not use shackles with loads in excess of the rated capacities (i.e., working load limits) indicated on the shackle by permanently affixed and legible identification markings prescribed by the manufacturer.

The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The Company will maintain a record of the dates and results of such tests.

OFFSHORE REQUIREMENTS

Only those employees with training and experience and have successfully completed a rigger training program are allowed to attach or detach load.

Rigger training include familiarization with qualifications such as:

- Rigging
- Slings
- Hardware
- The safe issues related to rigging, load lifting techniques
- Lift planning

The training program shall include classroom training, exams, and hands-on training.

Table H - 1. -- MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size, (inches)	Maximum Allowable Wear (inch)
1/4	3/64
3/8	5/64
1/2	7/64
5/8	9/64
3/4	5/32
7/8	11/64
1	3/16
1 1/8	7/32
1 1/4	1/4
1 3/8	9/32
1 1/2	5/16
1 3/4	11/32

Table H - 2. -- NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel, rope diameter (inches)	Number of Clips		Minimum spacing (inches)
	Drop forged	Other material	
1/2	3	4	3
5/8	3	4	3 3/4
3/4	4	5	4 1/2
7/8	4	5	5 1/2
1	5	6	6
1 1/8	6	6	6 3/4
1 1/4	6	7	7 1/2
1 3/8	7	7	8 1/4
1 1/2	7	8	9

Roles and Responsibilities

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding Roles and Responsibilities **Pacific Northwest Towers**; hereafter referred to as "The Company."

RESPONSIBILITIES

Safety Officer

- Ensure that all personnel exposed to sandblasting are trained in the awareness and avoidance of unsafe work practices.
- All the responsibilities of a worker/employee.
- Inspect the physical conditions of a workplace during regular work hours or part of a workplace at least once a month, so that the entire workplace is inspected at year end.
- Complete Monthly Hazard Reports and make recommendations to the Employer.
- Participate in accident/incident investigations, Toolbox meetings, quarterly Health and Safety Committee meetings, and overall site inspections.
- Identify situations that may be a source of danger or hazardous to workers.
- Has the right to obtain information from the Company regarding the health and safety in the workplace.
- Be actively involved in the event of a work refusal.
- Help to mediate disputes over unsafe work conditions.
- Maintain a current First Aid Certificate. And be available to provide assistance in the event of an emergency and be familiar with the emergency procedures.

Personnel

- Follow all aspects of this safety policy.
- Report to work mentally and physically able.
- To know, understand, and comply with the Company's Policies & Procedures as well as the *Occupational Safety and Health Administration regulations.*
- To wear the appropriate safety equipment and use personal safety devices as outlined in the Personal Protective Equipment Policy.
- Report any defects in equipment or a protective device to a supervisor immediately.
- Report all accidents, injuries, or "near misses" to a supervisor immediately, regardless how minor.
- Take every reasonable precaution to protect the safety of the other workers as well as themselves.

- If medical aid supplies are taken out of a Company First Aid Kit, an Injury Treatment Record Sheet must be filled out. These are located at the Employee Entrance in the phone desk.
- Regularly attend Company Health and Safety meetings.

Supervisors

- All the responsibilities of a worker/employee.
- Advise a worker of the existence of any potential or actual danger to the health and safety of a worker, of which the Foreman is aware.
- When so prescribed, provide a worker with written instructions of the measures and procedures to be taken for the protection of the worker.
- Provide Site Orientation for new workers and new projects.
- Inspect worksite on a weekly basis and forward this Inspection Report to the Safety Coordinator.
- Appoint a Competent Worker; to operator heavy equipment and hoisting devices, to welding applications, perform a fire watch, and/or to train another employee.
- Investigate thoroughly any accident/incident occurring at the workplace and implement the remedial steps necessary to prevent a recurrence.
- Maintain First Aid Certificate.

Company

- Provide the equipment, materials, and protective devices as prescribed.
- Maintain the working condition of the equipment, materials, and protective devices provided to workers.
- Ensure that all policies and procedures regarding health and safety in the workplace are being carried out in the workplace.
- Ensure information, instruction and supervision is provided to all workers to protect their health and safety on the job.
- In a medical emergency, for diagnosis or treatment, provide upon request confidential information to a legally qualified practitioner and to such other persons as may be prescribed.
- Establish and maintain a Safe Return to Work Program.
- Appoint a competent person when hiring or naming a Supervisor/Foreman.
- Acquaint any worker or a person in authority over a worker(s), with hazards in the handling, storage, use disposal and/or disposal of any article, device, equipment, or a biological, chemical or physical agent.
- Assist and cooperate with the Health and Safety Committee.
- Only employ in and about the workplace, workers who are over such an age as prescribed.

- Post a copy of the Occupational Safety and Health Administration Regulations for Construction Projects, "In Case of Injury at Work" Poster and Company Policies, in a prominent place at the workplace.
- Prepare and maintain a yearly written Health and Safety Policy Statement.
- Carry out training programs for its Workers, Supervisors and Health and Safety Committee Members.
- Remain active and current with the health and safety in the workplace.

Subcontractors

- Adhere to the general contractor's/constructor's program requirements.
- Monitor site conditions in their area and take corrective action.
- Report lost-time injuries immediately to the constructor.
- Request help in dealing with hazards created by another employer's workforce.

POLICY

The health and safety responsibilities of all parties on a construction project are specified in the current Occupational Safety and Health Administration (OSHA) regulations for Construction Projects. Responsibilities are prescribed for constructor, employer, supervisor, and worker. Each party has specific responsibilities to fulfill on a construction project. For more detailed information, consult the current Occupational Safety and Health Administration.

Health and Safety Representatives and Committee Requirements Under the Occupational Safety and Health Administration

Workforce of 6 – 19, and more than 3 months:

- One Health and Safety Representative, selected by workers.
- Powers and Rights
  - Obtain information from a constructor or employer regarding the testing of equipment, materials or chemicals in the workplace.
  - Inspect the workplace at least once a month, with the full cooperation of constructor, employers and workers.
  - Ask for and obtain information regarding existing or potential hazards in the workplace.
  - Make health and safety recommendations to a constructor or employer, who must respond in writing within 21 days, either giving a timetable for implementation or giving reasons for disagreeing with the recommendations.
  - Where a person has been killed or critically injured in the workplace, investigate the circumstances of the accident and report findings to OSHA

- Exercise all the powers granted to the health and safety representative by virtue of a collective agreement.

Workforce of 20 -49, and more than 3 months:

- Joint Health and Safety Committee, created by constructor or employer.
- Comprised of at least two members, one non-management worker and one management representative.
- Worker representative selected by workers and Management representative selected by constructor or employer.
- Powers and Rights:
  - Identify situations that may be a source of danger or hazard to workers.
  - Make recommendations regarding health and safety matters.
  - Recommend the establishment, maintenance, and monitoring of programs.
  - Obtain information from constructors or employers regarding testing of equipment or environments and be present when testing is initiated.

EMPLOYER

Provide a workplace free from serious recognized hazards and comply with standards, rules and regulations issued under the OSHA Act. Examine workplace conditions to make sure they conform to applicable OSHA standards. Make sure employees have and use safe tools and equipment and properly maintain this equipment.

Safety Coordinator/Health and Safety Support Personnel

- Advise all employees on health and safety matters.
- Coordinate health and safety activities throughout the project/company.
- Collect and analyze health and safety statistics.
- Provide health and safety training.
- Conduct research on special problems.

The health and safety representative must be familiar with the current *Occupational Safety and Health Administration* for Construction Projects procedures in the event of an emergency for refusal to work where health and safety are in danger.

SUPERVISOR

Supervisors must ensure that workers use the methods, procedures, and equipment required by the Occupational Safety and Health Administration for construction projects. Supervisors must ensure that all employees wear the company required equipment and/or clothing provided. Supervisors must also inform all employees of site specific/job specific hazards and hand out written information when it is necessary.

WORKER

Select worker representatives for A Safety Committee. Tell your supervisor or employer about equipment problems or other hazards that could hurt you or other workers. You have the right to refuse work that you believe endangers your health or safety-or the health or safety of others. Follow The Company instructions to use or wear equipment, protective devices, or clothing. Never engage in horseplay on site (pranks, competitions, showing off your strength, roughhousing, or unnecessary running).

CONSTRUCTOR

Appoint a supervisor if 5 or more workers are on the project at the same time. Ensure that the project is supervised always. A project that lasts more than 3 months and has 20 or more workers must have A Safety Committee. If a Safety Committee is not required and there are more than 5 workers, the workers must select **Joaquin Blas.**. Complete an OSHA registration form. Keep a copy of all employer-approved registration forms on site while employers are on the project. Send a notification of project to OSHA. Develop written emergency procedures, make sure your employees know what they are, and post them on site. Ensure ready access to a telephone, two-way radio, or other system in the event of an emergency. Report a fatality, critical injury, or other prescribed incident such as critical injury to OSHA.

Visitors

- A logbook is located at the front office for visitors.
- All visitors are required to sign in and out.
- All visitors are to be escorted by an employee of The Company.
- All visitors to the shop area will be provided with appropriate PPE.

Accidents and Injuries

All accidents and injuries, regardless of severity, must be reported immediately. Procedures for reporting accidents and the type of accidents that must be reported are in the Occupational Safety and Health Administration.

Joaquin Blas. who receives a complaint regarding a dangerous circumstance can investigate the complaint under the authority of the Occupational Safety and Health Administration. The member may also ask a supervisor to investigate a situation where the member "has reason to believe" that a dangerous circumstance may exist. The supervisor must investigate the situation promptly in the presence of **Joaquin Blas.**. **Joaquin Blas.** may also request that another certified member representing the other party at the workplace investigate the situation if the first certified member "has reason to believe" that the dangerous circumstance still exists after the supervisor's investigation and remedial action, if any, has been taken. The second certified member must promptly investigate the situation in the presence of the first certified member and, if both certified members agree, they may direct the constructor or employer to stop work or stop

the use of any part of the workplace, including machines and other equipment. The constructor or employer must immediately comply with the order. If both certified members do not agree that a dangerous circumstance exists, either may request that a OSHA inspector investigate the situation. The inspector must investigate and provide both members with a written report.

OSHA INSPECTORS

The inspector can visit a site at any time and exercise broad powers to inspect, ask questions, and give orders. If the inspector approaches a worker directly, the worker must answer questions and cooperate. The supervisor must be informed of any orders given or recommendations made. In some cases, the health and safety representative, worker, member of a health and safety committee, or worker selected by fellow workers or the union has a right to take part in accident investigation. The results of accident investigation and reporting should be made known to all personnel on site. Recommendations should be implemented to prevent the accident from happening again.

TRAINING AND ORIENTATION

Statistics show that about 20% of all injuries to workers occur within their first 30 days on the job. This fact highlights the importance of orientation. Newly hired workers may be young or old, male or female, experienced or inexperienced in construction. The worker may be new to the site, new to the type of work, or new to the company. A worker coming to any project for the first time should be considered a new worker and should be given proper orientation and training. New employees must be told and, if necessary, trained and shown what is expected of them in work performance safe operation of tools and equipment procedures around hazardous materials proper use of any required personal protective clothing and equipment. They must also be told, and preferably shown, the location of first aid kit or first aid station fire alarms and exits fire extinguishers and standpipes emergency telephones eyewash station supervisor’s office tool crib washrooms lunchroom. These locations can be pointed out during a tour of the workplace when the new worker is introduced to co-workers, supervision, and the health and safety representative. To make orientation successful, supervisors should follow some simple steps.
Talk to new employees. Put them at ease. Find out how much they know already. Explain why their job must be done right, how it relates to the rest of the operation, and what hazards may be involved. Explain assignments carefully to new workers. Tell them, show them, ask questions to make sure they understand. Cover one step at a time. Make key operations and safety points clear. Be patient and go slowly. Test the new worker's performance. Watch while the job is being done. Commend good work. When necessary, show how the job can be done more safely and efficiently. Let new workers continue on their own. Tell them who to contact for help and encourage them to get help when needed. Follow up. Check on work frequently at first. Look for any bad habits, unnecessary motions, or unsafe acts that need correcting. Ease off when you’re convinced that workers are doing the job safely and correctly.

JOBSITE SAFETY TALKS

Jobsite talks can help prevent accidents and injuries by promoting hazard awareness in the workplace. Supervisors should present safety talks on a regular basis and follow these guidelines. Before presenting a prepared talk, look it over.

Instead of reading the talk to your crew, use your own words. Personnel will more likely accept your natural manner than a formal presentation. Choose subjects that are directly related to site conditions or the company's health and safety policy and program. Encourage participation. Get the crew to talk about close calls and hazards. Solutions to these problems can become the subject of future talks. Make a note of any hazards the crew may mention as well as any suggestions for improving health and safety. Subjects requiring management attention should be referred to management. Always follow up. Tell the crew what has been done to correct problems and improve conditions on the job.

Silica

PURPOSE

The purpose of this document is to outline the Silica safety policy for **Pacific Northwest Towers**; hereafter referred to as "The Company."

This program applies to all The Company employees and operations and pertains only to sites owned by The Company.

RESPONSIBILITIES

The Company

- Ensuring that the materials (e.g., tools, equipment, personal protective equipment) and other resources (i.e., worker training materials) required to fully implement and maintain this exposure control plan (ECP) are readily available where and when they are required.
- Providing a job-specific ECP for each project, which outlines in detail the work methods and practices that will be followed on each site. Considerations will include:
  - Availability and delivery of all required tools/equipment;
  - Scope and nature of grinding work to be conducted;
  - Control methods to be used;
  - Level of respiratory protection required;
  - Coordination plan.
- Conducting a periodic review of the effectiveness of the ECP. This would include a review of the available dust-control technologies to ensure these are selected and used when practical.
- Initiating sampling of worker exposure to concrete dust when there are non-standard work practices for which the control methods to be used have not been proven to be adequately protective.
- Ensuring that all required tools, equipment, and personal protective equipment are readily available and used as required by the ECP.
- Ensuring supervisors and workers are educated and trained to an acceptable level of competency.
- Maintaining records of training, fit-test results, crew talks, and inspections (equipment, PPE, work methods/practices).
- Coordinating the work with the prime contractor and other employers to ensure a safe work environment.

Management

- Obtaining a copy of the ECP from the employer, and making it available at the worksite.
- Selecting, implementing, and documenting the appropriate site-specific control measures.
- Providing adequate instruction to workers on the hazards of working with silica-containing materials (e.g., concrete) and on the precautions specified in the job-specific plan covering hazards at the location.
- Ensuring that workers are using the proper respirators and have been fit-tested and that the results are recorded.
- Directing the work in a manner that ensures the risk to workers is minimized and adequately controlled.
- Communicating with the prime contractor and other sub-contractors to ensure a safe work environment.

Employees

- Knowing the hazards of silica dust exposure.
- Using the assigned protective equipment in an effective and safe manner.
- Be an experienced and responsible person assigned by the supervisor to work with the new employee.
- Be selected based on a history of safe work and policy/procedural knowledge.
- Be able to communicate the expectations and characteristics of work tasks and their associated hazards.
- Have a patient disposition, as well as the desire and willingness to devote the necessary time to succeed as a mentor.
- Possess knowledge and skills in the job tasks assigned to the SSE.
- Be willing and able to effectively listen to the SSE to determine if the SSE is learning and retaining the knowledge being shared.
- Be willing to watch a SSE perform a job without interfering as long as the SSE is not in a position to harm themselves, others, the environment or the equipment.
- Adopt a positive safety attitude, avoid criticism, and strive to build confidence and self-esteem in the SSE.
- Be able to teach the SSE the proper way to create a quality JSA and to follow that JSA in performing tasks.
- Keep abreast of new equipment in their field of expertise.
- Refrain from taking shortcuts and doing anything else that jeopardizes health or safety.
- Demonstrate a positive work ethic at all times, and
- Introduce the **SSE Checklist** to the new employee. The checklist is a tool to train the new employee and monitor progress.
- Review the checklist with the new employee periodically over a six-month period, and forward the information for supervisor and management review, and

- Follow all company policies and procedures.
- Setting up the operation in accordance with the site-specific plan.
- Following established work procedures as directed by the supervisor.
- Reporting any unsafe conditions or acts to the supervisor.
- Knowing how and when to report exposure incidents.

HEALTH HAZARDS

Crystalline silica dust can cause a disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening and scarring of the lung tissue. The scar tissue restricts the lungs' ability to extract oxygen from the air. This damage is permanent, but symptoms of the disease may not appear for many years.

A worker may develop any of three types of silicosis, depending on the concentrations of silica dust and the duration of exposure:

- Chronic silicosis—develops after 10 or more years of exposure to crystalline silica at relatively low concentrations.
- Accelerated silicosis—develops 5 to 10 years after initial exposure to crystalline silica at high concentrations.
- Acute silicosis—develops within a few weeks, or 4 to 5 years, after exposure to very high concentrations of crystalline silica.
- Exposure to silica has been shown to cause silicosis, lung cancer, pulmonary tuberculosis and other airway diseases.

Initially, workers with silicosis may have no symptoms; however, as the disease progresses, a worker may experience:

- Shortness of breath,
- A Severe cough,
- Weakness.

These symptoms can worsen over time and lead to death.

Exposure to silica has also been linked to other diseases, including bronchitis, tuberculosis, and lung cancer.

EXPOSURE

The Company will ensure that a worker's exposure to silica is kept as low as reasonably achievable. The Company will ensure that a worker's exposure to silica does not exceed its occupational exposure limit of 0.025 mg/cubic meter over an 8-hour time period.

The Occupational Health and Safety Regulation lists an occupational exposure limit (OEL) for respirable crystalline silica (including quartz) of 0.025 milligrams per cubic meter (mg/m^3). This is a concentration to which nearly all workers could be exposed for eight hours a day, five days a week, without adverse health effects. However, as a suspected carcinogen, crystalline silica is also an ALARA substance, and exposures must be reduced to levels as low as reasonably achievable below the OEL.

Our firm commits to developing knowledge and expertise about these controls, and to establish policies/procedures to protect workers from harmful exposure and to minimize reliance on respirators. Effective engineering controls such as HEPA vacuum attachments and wetting methods, which control silica dust at its source. These controls have been proven to reduce airborne dust levels significantly when selected and operated in accordance with best practices. We know that engineering controls alone do not reduce airborne silica to safe levels; so, in most cases, other control measures, including respiratory protection, will be necessary.

If we take on a job that could release an unusually high amount of dust, and we are unsure of the adequacy of our control measures, we will conduct air sampling in order to ensure that control methods are protective.

The Company will reduce or eliminate worker exposure to silica dust by selecting a combination of the following controls listed in order of preference:

- Elimination and substitution,
- Engineering,
- Administrative,
- Personal protective equipment.

We recognize the importance of planning the work in order to minimize the amount of silica dust generated.

- During the project planning phase, we will advocate for the use of methods that reduce the need for cutting, grinding, or drilling of concrete surfaces (e.g., formwork planning).
- Whenever possible, we will schedule work when concrete is still wet, because we know that much less dust is released at that time.

Engineering controls such as ventilation or wet methods must be used to control silica-containing dust.

CONTROL OF DUST

Our dust control systems may employ three well-established techniques:

- Local exhaust ventilation (LEV);
- Wet dust suppression (WDS);

- Restricting or isolating the work activity with barriers or full enclosures (this may be the only option where LEV or WDS is not practical or effective).

When LEV is used in our work, we will employ the following systems and safe work practices:

- Vacuum attachment systems to capture and control the dust at its source whenever possible.
- Dust control systems (used regularly and well maintained).
- Grinding wheels operated at the manufacturers' recommended rpm (operating in excess of this can generate significantly higher airborne dust levels).
- Retrofit shrouds or exhaust cowlings for corner grinding; use manufacturer-specified rpm speeds and a well-maintained HEPA vacuum.
- Diamond stone grinders, which allow for the use of a more efficient suction casing on the grinder, whenever practicable.
- HEPA or good quality, multi-stage vacuum units approved for use with silica dust. [The vacuum units should be capable of creating a target airflow of at least 70 cfm. This should achieve a face velocity at the shroud of about 1.3 m/s (260 fpm)—the higher the face velocity, the more dust captured at source.]
- Work planning, so that concrete grinding can be completed when wet (dust release can be significantly reduced).
- Good housekeeping work practices (for example, use vacuums with high-efficiency particulate air (HEPA) filters, or use wet sweeping).
- Train workers and supervisors on how to properly use and maintain the equipment.

WATER SPRAY SYSTEMS

When water spray systems are used in our work, we will follow these safe work practices:

- Pneumatic grinders will be used instead of electric-powered grinders if water is the method of control.
- Pressure and flow rate of water will be controlled in accordance with tool manufacturers' specifications (for cutting saws, a minimum of 0.5 liters of water per minute [0.13 gallons/minute] should be used).
- When sawing concrete or masonry, we will use only saws that provide water to the blade.
- The wet slurry will be cleaned from work surfaces when the work is completed, using a wet vacuum or wet sweeping.

BARRIERS

When barriers or enclosures are used in our work, we will follow these safe work practices:

- The site foreman will determine the type and design of barrier or enclosure (based on the work activity and the work area) and ensure it is constructed in accordance with the work plan. Barriers may be simple hazard-flagging ribbon or more restrictive hoarding.

- We will use commercially available negative air units when constructing a full enclosure.

ADMINISTRATIVE CONTROLS AND SAFE WORK PRACTICES

We will follow these safe work practices:

- Exposure control plans and the site risk assessment/work plan will be submitted to the general contractor prior to the start of work.
- We will establish procedures for housekeeping, restricting work areas, personal hygiene, worker training, and supervision.
- As part of our project planning, we will assess when silica dust may be generated and plan ahead to eliminate or control the dust at the source. We recognize that awareness and planning are key factors in the prevention of silicosis.
- Warning signs will be posted to warn workers about the hazards of silica and to specify any protective equipment required (for example, respirators).
- Work schedules will be posted at the boundaries of work areas contaminated with silica dust.
- Work that generates silica dust will be conducted after hours when access to other unprotected workers cannot be restricted.
- Full shift personal samples shall be representative of the employees regular, daily exposure to silica.

PPE

The Company will provide workers in a restricted area with protective clothing that protects other clothing worn by the worker from silica contamination.

Personal protective equipment such as gloves, coveralls and eye protection should be used to control silica exposures.

RESPIRATORY PROTECTION

Respirators must be selected based upon measured exposure levels and the assigned protection factor of respirators.

- All workers who wear respirators will do so in adherence to our respirator program.
- Respiratory protection will be selected based upon the site-specific risk assessment.
- Only NIOSH-approved respirators will be used.
- Workers who wear respirators will be clean-shaven. Filtering facepiece respirators give little or no protection to workers with beards, and even a minor growth of stubble can severely reduce the effectiveness of respiratory protection.
- All workers who wear respirators will be fit-tested.
- Workers will be properly trained in the use of respirators, and a high standard of supervision, inspection, and maintenance will be followed.

PROTECTIVE CLOTHING

Workers will wear protective clothing as specified in our task-specific safe work procedures to prevent contamination of worker clothing. Workers will not use compressed air to clean themselves, their clothing, or their equipment.

TRAINING

Training is required prior to using silica-containing materials or working in an environment known to contain airborne concentrations of Silica, and periodic refresher training is also required. Refresher training is done each quarter and is documented. Documentation is kept on file for all employees. The Company will ensure that a worker who may be exposed to silica:

- Is informed of the health hazards associated with exposure to that substance,
- Is informed of measurements made of airborne concentrations of harmful substances at the work site, and
- Is trained in procedures developed by the employer to minimize the worker's exposure.

Training may be performed in-house or by a 3rd Party.

We will train all workers potentially exposed to airborne silica dust in the following:

- Hazards associated with exposure to silica dust
- The risks of exposure to silica
- Signs and symptoms of silica disease
- Safe work procedures to be followed (e.g., setup of enclosures, disposal of silica waste, personal decontamination)
- Use of respirators and other personal protective equipment (e.g., donning and doffing of personal protective equipment, and cleaning and maintenance of respirators)
- Use of control systems (e.g., LEV and wet methods)
- How to seek first aid (for example, the location and use of eyewash stations)
- How to report an exposure to silica dust

Records of training will be kept, as specified in the OSHA Regulation.

HEALTH ASSESSMENT

The Company will comply with the requirements outlined in Part 4, Section 40 (2) of the OHS Code. The person with custody of the health assessment record must ensure that no person, other than the worker or health professional who conducts the health assessment, has access to the exposed worker's health assessment unless:

- The record is in a form that does not identify the worker, or
- The worker gives written permission for access by another person.

The Company will ensure that a worker undergoes a health assessment:

- Not more than 30 calendar days after the worker becomes an exposed worker, and
- Every two years after the first health assessment. Exposed workers may refuse to undergo part or all of a health assessment by giving the employer a written statement refusing it.

The Company will pay the cost of the health assessment. An employer must ensure that, if it is reasonably practicable, a health assessment is performed during normal work hours.

The employer shall individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees. Whenever an exposure assessment indicates that employee exposure is above the PEL, the employer shall describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

Subcontractor Management Plan

PURPOSE

The purpose of this document is to outline the Subcontractor pre-qualification, evaluation, selection and monitoring process for **Pacific Northwest Towers;** hereafter referred to as "The Company."

RESPONSIBILITIES

Management

- Will ensure roles associated with supervision and direction provided to subcontractors.
- Apply safe work procedures to ensure contract employees are aware of hazards associated with work to be performed through hazard assessment and/or inspections.

TRAINING

The company reviews the subcontractor's lagging safety metrics for past safety performance, the subcontractor's policies, and procedures to ensure that those policies and procedures conform to regulatory and contractual requirements, that the subcontractor's affected employees have been trained in the appropriate safety topics, and that the subcontractor has an acceptable safety program.

PREQUALIFICATION PROCESS

The Company will ensure that all contractors and subcontractors, have a current, up-to-date and functioning safety program through the following process:

- Initial and periodic review of written safety programs/policies and procedures to ensure accuracy with relevant legislation, and that that all employees working on behalf of the contractor/subcontractor are trained in the written plan.
- Initial and periodic review of all safety training documents including certifications that may apply.
- Initial and periodic review of safety statistical data.

METRICS EVALUATION/MONITORING

Prior to initial assignment, The Company will perform an evaluation of all contractors and subcontractors' safety metrics including TRIR, EMR, DART and Fatality Rate as criteria for making hiring decisions. A benchmark of relevant industry specific BLS (Bureau of Labor Statistics) industry average will be used to compare with contractor and subcontractor's current statistics to ensure only the safest contractors are allowed to perform work on behalf of The Company.

CONTRACTOR AND SUBCONTRACTOR PARTICIPATION

All contractors and subcontractors performing work on behalf of The Company, or on worksites that are under the supervision of The Company will be required to attend all pre-job meetings or kick-off meetings as well as safety orientations and tailgate safety meetings.

In addition to kick-off meetings, subcontractors shall be included in all tailgate safety meetings, job safety analysis/hazard assessments, and on the job safety inspections.

RECORDKEEPING

Written and Documentation Requirements

Our organization has taken the following incident/injury recordkeeping and reporting procedures:

- Records of scheduled and periodic inspections including the person(s) conducting the inspection, the workplace hazards (i.e., unsafe conditions and work practices that have been identified) and the action(s) taken to correct the identified unsafe conditions and work practices, are recorded on the Job Hazard Analysis Form*. These records are maintained for at least one (1) year.
- Documentation of safety and health training for each worker, including the worker's name or other identifier, training dates, type(s) of training, and training providers are recorded on the Worker Training and Instruction Record*. This documentation is maintained for at least one (1) year.
- All subcontractors report to the company all incidents and accidents in a prompt and timely manner.
- Subcontractors involved in any incident or accident perform an incident investigation, identify root causes and causal factors, develop corrective actions, and have a methodology for determining the effectiveness of the corrective actions.

In accordance with OSHA regulations, The Company will keep records of fatalities, injuries and illnesses. Specifically, The Company will keep record of each fatality, injury and illness that:

- Is work-related; and
- Is a new case; and
- Meets one or more of the general recordkeeping criteria.

REVIEW AND FOLLOW UP

Upon conclusion of each job, The Company perform a post-job safety performance review with all contractors and subcontractors. Continual follow up and discussions about safety performance will help The Company maintain safe and healthy worksites. The review must include a combination of factors to be considered including, but not restricted to, housekeeping, costs, safety, and quality of work.

Tower Climbing and Fall Protection Program

PURPOSE

Pacific Northwest Towers regards safety and health as the primary consideration in any job, and is committed to preventing job-related accidents and illnesses by establishing and adhering to a Tower Climbing and Fall Protection Program. By establishing training, medical qualifications, physical fitness, equipment, conduct standards and consolidating the various industry and government standards on the subject, the program will be established and maintained at all levels.

General Requirements

In accordance with 29 CFR 1910, 29 CFR 1926, ANSI A10.48 and TIA 222/322, it is required that all telecommunications employees, and sub-contractors who perform tower or elevated work must be determined to be medically qualified to perform those jobs, must be trained and certified as "Qualified" to perform those jobs, have the appropriate equipment to do the job, work on structures that are safe and perform those jobs in accordance with this policy and the Code of Federal Regulations.

The Company shall ensure all work and training is done in accordance with the current industry standard that establishes criteria for safe work practices and training for personnel performing work on communication structures, A10. 48 Standard.

Pacific Northwest Towers tower climbers shall only climb towers certified by the manufacturer to meet the Telecommunications Industry Association/Electronic Industries Association (TIA/EIA) 222/322 for tower construction and 29 CFR 1910.66 for anchorages. Towers that do not meet these standards will be red tagged as "Do Not Climb!" until they are retrofitted or replaced with towers that meet these standards. Service can be accomplished by other methods (i.e. aerial devices, etc.).

The ultimate responsibility for determining whether "to" or "not to" climb a tower or do-elevated work lays with the climber/worker, as they are ultimately at risk.

RESPONSIBILITES

The Company

- Will develop, implement, and inspect the Tower Climbing and Fall Protection Program annually and needed prior to each unique worksite
- Ensure that the established Tower Climbing and Fall Protection Program is carried out in an effective manner.
- Assure that employees receive the proper training required in the use, care, and inspection of fall protection equipment and ensure the proficiency requirements, which allow workers to perform climbing activities, are met.

- Maintain an inventory of qualified climbers, perform an annual inspection of PPE
- Remain aware of health issues with employees who climb, and climbers adhere to good safety practices.
- Shall specify the fall protection system to be used before engaging in the work activity. The job supervisor shall ensure that a Site-Specific Fall Protection plan is completed, and pertinent work procedures are clearly defined and well understood by employees and sub-contractors.
- Evaluate the physical condition of any climber before allowing them to climb. If a work crewmember identifies a safety concern, the job supervisor shall stop all work until the issue is resolved.

As the job progresses, the job supervisor shall be aware of changes in conditions and events that may require review and modifications of the fall protection system in use or work procedure plan.

The Company will ensure that all climbing and fall protection equipment is inspected prior to each use.

The supervisor and each member of a work crew have the responsibility to adhere to fall protection rules and procedures and identify unsafe and unhealthful conditions that exist or are anticipated at a job site. They are required to participate in the development of a risk assessment of the job task to obtain an understanding of the safety and health requirements and the work procedures of the job.

A minimum of 2 competent rescue climbers shall be onsite while performing elevated tower work.

Workers shall be responsible for inspecting their personal fall protection equipment prior to each use. Workers will make the job supervisor aware of any physical conditions that may impact their ability to perform the work.

The use of recreational descent devices such as rack bars, figure 8's, and fisk descenders is prohibited, per latest revision of ANSI Z359.

POLICY

Personal Protective Equipment

The personal protective equipment described is utilized to help place the worker in a desirable working position and to reduce the probability of potential fall accident injuries.

- Personal protective equipment must be stored in a dry, dark, secure area and protected from cuts, abrasions, and chemicals when not in use.
- Mandatory inspection of equipment before each use by the user will serve to minimize accidents resulting from deterioration of equipment.
- All fall protection equipment shall periodically inspect on an annual basis and a record of the inspection shall be maintained in the office or site files.

- Manufacturer's instructions and recommendations shall be incorporated into inspection, replacement, and preventive maintenance programs. Defective equipment shall be immediately removed from service and tagged **"Do Not Use"** until repaired.
- If defective equipment is determined to be non-repairable, it shall be disposed of immediately.
- Equipment shall meet (at minimum) the latest revision of ANSI A10.48.

Fall Prevention/Positioning System
Full Body Harness
A full body harness, as defined in 29 CFR 1926.500, means straps which may be secured about the worker in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders.

It will be provided with a means for attaching to other components of a personal fall arrest system.
As of January 1, 1998, the use of a body belt (safety belt) for fall arrest is prohibited.

- Any full body harness used shall be certified by the manufacturer to meet all OSHA standards and regulations.
- The climber may use personal preference in selecting the most appropriate harness to wear and shall ensure the harness fits properly.
- A full body harness with positioning strap or lanyard will not prevent falling vertically (sliding) down wood poles.
- The full body harness, with a positioning strap or lanyard, is a fall prevention system when the positioning strap or lanyard will limit falls to 2 feet (610 mm) or less.
- Non-composite (100 percent leather) positioning straps and body belt buckle straps **shall not be used.**
- Full body harnesses shall have a chest strap and a seat strap to distribute part of the load across the buttocks. The D-ring located at the center of the upper back will be the connection point for a fall arrest safety lanyard to distribute forces to the body most effectively. The D-ring located front and center of the upper chest may be worn when the work procedure warrants.

Full body harnesses shall be periodically inspected for the following:

- Cuts, tears, and chafing.
- Electrical burns.
- Physical deterioration.
- Ultraviolet deterioration.
- Wear on connection devices.
- Evidence of shock loading.
- Chemical damage and/or deterioration.
    - Suspect body harnesses shall be destroyed.
    - Body harnesses shall be stored in a dry, dark, and a protected environment.

Positioning Strap/Rope Lanyard

Positioning straps or rope lanyards shall have each end snapped into a separate D-ring of full body harness when in a rest or work position. Rope lanyards will be spliced by the manufacturer or his qualified representative to connect fittings, other ropes, extensions, and attachments with a minimum four tuck splice.

- Snap hook gates shall face outward away from the worker's body. As of January 1, 1998, the use of non-locking snap hooks as part of a personal fall arrest system and/or positioning device is prohibited. Multiple snap hooks of the locking type and/or approved carabiners may be attached to a single D-ring.
- Tools, hand lines, or other objects that may interfere with the snap hook and cause rollout shall not be attached to or hung from the positioning strap.

Positioning straps and rope lanyards shall be inspected for the following:

- Snap hook keeper spring tension.
- Exposure of colored wear-warning inner layer.
- Elongation of holes in positioning strap material.
- Cuts, burns, extra holes, or fraying of material.
- Loose or worn rivets.
- Cracks, burns, or corrosion in the snap hook.
- Excessive side movement of the snap hook keeper.
- Chemical damage and/or deterioration.

Fall Arrest Equipment

- All fall arrest equipment shall have locking-type snap hooks or approved carabiners that meet or exceed applicable OSHA and ANSI requirements. This equipment minimizes physical trauma to the worker, comfortably supports the worker after a fall until a rescue can be made and suspends the worker in a more easily retrievable position for rescuers.
- Fall arrest equipment should be attached to an anchorage as described in 29 CFR 1926.502 Subpart M. Regardless of the attachment height, the length of the body attachment shall be such that the free fall distance (see definition) shall not exceed 6 feet (1.9m).
- Fall arrest equipment receiving an impact or shock load from a fall shall be removed from service, tagged "Do Not Use."

The preventive maintenance and inspection program for PPE shall include determination of shelf and service lifetimes and the load limitations for the system to be used as per manufacturer's recommendations.

Lanyards with Energy Absorber
Lanyards and their associated energy absorbers shall be used in accordance with the following:

- Possible falls into a fall arrest system shall not exceed 6 feet (1.9 m) free fall,
- 9.5 feet (2.9 m) total fall distance, and 1,800 pounds (8kN) maximum force.
- Manufacturer's shock force data or test data should be incorporated into the total arrest system design (including anchorage).
    - Lanyards shall be equipped with self-locking snap hooks or carabiners.
    - Lanyards shall not be knotted.
    - Lanyards shall not be attached back onto themselves unless they are designed for that purpose.

Lanyards and energy absorbers shall be inspected for the following:

- Partial activation of the energy-absorbing device.
- Cuts, tears, and chafing.
- Electrical burns.
- Physical and ultraviolet light deterioration.
- Wear on snap hooks.
- Operation of snap hooks.
- Chemical damage and/or deterioration.

Suspect lanyards and/or energy absorbing equipment shall be tagged "Do Not Use" before they are destroyed. Lanyards and energy absorbing devices shall be stored in a dry, dark, and protected environment.

Self-retracting Lanyard/Lifeline
Self-retracting lanyards and lifelines are attached to an automatic rewinding reel that quickly arrests a fall and limits the shock load to the worker.

Self-retracting lanyards and lifelines limit the freedom of movement up to the length of the lanyard or webbing.

- Manufacturer's energy absorbing data or test data should be incorporated into the total arrest system design (including anchorage).
- Self-retracting lanyards that have shock force indicators should be used (when available).
- Self-retractable lanyards shall be equipped with self-locking snap hooks or
- Self-retracting lifelines shall be permanently marked with the manufacturers' name, model number, rating, and date of manufacture.

Self-retracting lanyards and lifelines shall be inspected for the following:

- Partial activation of the energy-absorbing device.
- Snap hook keeper spring tension.

- Cuts, burns, extra holes, or fraying of material.
- Excessive side movement of the snap hook keeper.
- Chemical damage and/or deterioration.

Suspect or shock activated self-retracting lanyards and lifelines shall be tagged "Do Not Use" and returned to the manufacturer or other authorized repair service for repair. Periodic inspections shall be in accordance with the manufacturer's recommendations.

Safe Climb Devices
Safe climb devices, which usually consist of a fixed rail, tube, or tensioned cable with slider, shall be maintained to permit the worker using the system to climb without continually having to hold, push, or pull any part of the system, leaving both hands free for climbing.

The connection between the slider and the attachment point on a full body harness shall not exceed 9 inches (230 mm). These systems shall be activated within 2 feet (610 mm) after a fall occurs, in order to limit the descending velocity of the worker to 7 ft/sec (2.1 m/sec) or less. These systems are typically mounted on the face of a fixed ladder or the structure.

The climber shall ensure that the structure, system, and PPE are inspected prior to use to ensure proper operation and good working order. If a climbing system is found to be defective, the climber will use an approved alternative climbing and fall arrest method or elect not to climb.

Rescue Equipment
Controlled descent devices are used to make emergency descents from aerial devices or elevated positions on structures. Controlled descent devices shall be sized to include the maximum elevated position obtainable from the bucket, platform, or elevated position. The rate of descent may be controlled by the worker (or rescuer) or by a friction type brake.

These devices shall be attached to the full body harness such that the worker (or rescuer) will have control of the descent and be able to attach and detach him or herself. Supervisors shall ensure that necessary components to affect the attachment between the descent device and the climber's full body harness are stored with the descent device.

Controlled descent devices shall be stored in a clean, dry, protected environment. They shall be cleaned and carefully inspected prior to and after each use.

The rescue equipment shall be designed to work with the type of structure(s) or aerial devices that workers (or rescuer) may be required to use the equipment.

Tower climbers may consolidate the issues of safety and personal preference in selecting their choice of personal safety equipment best suited for the job.

Observers/visitors shall not enter the work area or drop zone unless authorized by the supervisor and will be equipped with personal protective equipment dictated by the hazards present.

The following list specifies safety equipment that is either required or recommended to be used while on the job site and for climbing towers.

Head Protection - All personnel shall wear hard hats or approved safety helmets on the job site whether they are on the ground or climbing the tower. Anyone within the drop zone (radius) of a communications tower construction project must wear a hardhat and exercise caution. When using hardhat liners, it is important the hard hat fits over the additional headgear. Hard hats or safety helmets will also be equipped with chinstraps and used.

Foot Protection - Steel toed, reinforced soled tower climbing boots or shoes are recommended for tower climbers. The specific climbing conditions such as tower structure and weather conditions will dictate to the climber what the best foot protection will be. Personal preference in selecting the most appropriate safety footwear shall prevail. Tennis and other soft- soled shoes shall not be used for tower climbing.

Hand Protection - Leather work gloves are recommended when climbing towers.

Eye Protection - Safety goggles or safety glasses shall be used whenever eye safety is at risk.

Ear Protection - Ear plugs should be used whenever ear safety is at risk.

Clothing - Suitable work clothes shall be worn when climbing towers to offer protection from cuts and abrasion, weather conditions, and other tower structure hazards. Adequate work clothing should consist of coveralls, pants, and shirts made of material suitable for outdoor working conditions. Tower climbing with only short pants (shorts) and/or no shirt are prohibited. Clothing shall not be too loose or ragged and should be free from snag hazards such as loops and belts.

Communications Devices – Hands free, voice actuated radio headsets should be worn by the tower climber (with their personnel hoisting provisions) and ground safety person to provide reliable communications during the work, negating the need for hand signals.

Radio Frequency (RF) Personal Monitor – Climbers shall be trained on the use of and will wear a calibrated RF level monitoring device when working around or on a tower which may have active transmitters or where the status of transmitters are unknown.

Personal Conduct - When tower climbing, always follow safe climbing practices and watch for any unsafe climbing practices by others at the job site. Unsafe climbing practices must be eliminated or corrected before accidents occur.

Unsafe climbing practices that are prohibited while working on towers are:

- Climber shows fatigue.
- Climbing through or past unprotected electrical conductors.
- Not inspecting tower or PPE before climbing.
- Attaching to a tower at an inadequate anchorage.
- Not maintaining 100% attachment.
- Throwing any material up or down while on tower.
- Failure to maintain a 3-point contact with the tower.
- Holding or attaching onto antenna lines, coax, conduits, etc. for support.
- Climbing while under the influence of alcohol or drugs.
- Climbing when ill or on medication that may negatively impact or impair good judgment or performance. Chapter III - Anchorages, Aerial, and Fixed Climbing Devices

Anchorage

Anchors may be welded (closed) (i.e. eyebolts, rigging points, slings, or ropes, or other attachments designed into the structure).

Anchorages shall meet the minimum requirements of an engineered system for each worker attached.
An engineered system shall be in compliance with the mandatory personal fall arrest systems in 29 CFR-1910.66 App C Personal Fall Arrest System (PFAS), and must meet the following basic criteria:

An anchorage of sufficient design to withstand a static load of 5,000 pounds or (22.2 kN) the maximum anticipated impact load times an overload capacity factor (OCF) of at least 2.0 for each worker.

- Energy absorbing properties of the fall arrest system, when incorporated into the anchorage design, will usually reduce the maximum forces imposed onto the anchorage.
- Refer to the above standard for more detailed criteria in anchoring the PFAS.
- Anchorage Considerations.

General

Additional static and dynamic loads shall not be attached to the same anchorage point as used for the PFAS.

The job supervisor, in concurrence with the qualified climber shall determine if the anchorage is to be used.

Anchorages shall be visually inspected at the time of attachment for loose or missing bolts, cracks, and bends. Damaged anchorages shall not be used, and the tower will be red-tagged as

"Damaged. Do Not Climb!" All damages will be documented and reported immediately to the tower owner.

Damage to anchorages shall be reported to the supervisor, the program coordinator, and noted on the RMW. The program coordinators will report all damages to the DOI Safety Management Information System (SMIS).

Rigging shall meet A10.48

Anchorages, Aerial, and Fixed Climbing Devices
Damaged anchorages will be repaired and certified by the manufacturer or a structural engineer prior to use.

Specific

- Attachment around a lattice tower member supported by one bolt on each end may be permitted with the proper fall arrest equipment if multiple-bolted members are not available.
- Preferred lattice anchorages are around multiple-bolted angle iron members or around and above joints where multiple members are connected.
- Attachment around and above all steel tower joints is permitted.
- Attachment around multiple bolted tower members is permitted.
- Attachment to slanted structure members should be avoided.
- A wire rope or padded lanyard shall be used around structural members that have potential for fraying and limits movement of the lanyard at the connection point.

Aerial Devices - Only qualified operators shall be permitted to operate an aerial device. Qualified operators shall be certified through training and experience to operate the specific aerial device employed. Required training will be formal training or specific training which will include emergency procedures from the company where the aerial device is obtained. Refer to 29 CFR 1926.453

Bucket and platform anchorages shall meet minimum engineered loads while limiting potential free falls to 6 feet (1.9 m) for a full body harness. Aerial device anchorages shall receive an annual inspection and a visual inspection prior to use. Boom straps are the preferred anchorage. Walking surfaces shall have an anti-skid surface.

Fixed Ladders - Communications tower ladder climbing devices shall comply with 29 CFR 1910.27 (Fixed Ladders) and be kept in good repair. Devices determined to be hazardous shall be immediately removed from service, reported to the Safety Manager and Program Coordinator, and red-tagged as "Damaged. Do Not Climb!" Corrective measures shall be completed prior to the next climb.

Fall Protection Requirements for Elevated Work
General - This chapter defines the fall protection requirements for working at elevated levels (6 feet or higher) on communications towers and related structures. The design and type of structure determines the method of climbing, PPE to be used, and fall protection device required for climbing, transferring, resting, working, and rescuing.

Qualified Climber Classification
- All "Qualified Climbers" shall be trained
- All "Qualified Climbers" shall have passed a physical examination.
- All "Qualified Climbers" will provide documentation of required tower climbing training and climbing experience (i.e. copy of RMW) to the Program Coordinator.
- A "Qualified Climber's" record will be reviewed annually for recertification

The Company shall provide qualified climbers OSHA required equipment and PPE for the performance of their duties.

Common Requirements - Prior to any tower climbing work, a Risk Assessment (RA) must be completed for each job site. The RA shall include a pre-climb tower checklist and inspection report to accurately determine the overall tower condition, electrical or RF hazards, and what PPE is required. This assessment will be documented on the RMW.

Tower climbers shall not service radio antenna systems connected to live radio transmitter equipment per 29 CFR 1910.147 (Lock-out/Tag-out). All other transmitters should be deactivated per 1910.97 (Nonionizing Radiation) and 1910.268 (Telecommunications) to prevent injuries to tower climbers while climbing in the vicinity of other antenna systems
During all climbing activities at least two (2) qualified climbers shall be present on the job site. One of these qualified climbers will have been a "Qualified Climber" for at least two years.

Workers shall be attached to an anchorage point at all times when working or resting at elevated locations (6 feet and above). Moving, relocating, transitioning, and transferring activities performed on the tower require 100% attachment to an anchorage point.

Tower climbers shall check for a safe "Climber Fall Zone" area on the tower when positioning themselves at the work position.

A personal RF monitor shall be worn when climbing structures that may have active transmitters in the area.

Climbing and Walking Surfaces - Climbing and walking surfaces on equipment, ladder rungs, etc., shall be furnished with nonskid surfaces where possible. Ladders with deteriorated nonskid surfaces shall be removed from service until repaired.

The walking surfaces shall be kept free of clutter. Climbing and walking on cross arms (crossed tower members and diagonal bracing) in lieu of a ladder is not recommended. Climbing pathways should be clear of any obstructions.

Working from an Aerial Device - Prior to operation of the bucket or platform, workers shall be attached to an engineered anchorage on the aerial device by a full body harness in conjunction with a shock absorbing or retractable lanyard. Snap hooks shall be of the self- locking type. Working or standing on any rail of an aerial device shall not be permitted (All work will be performed from the floor of the platform).

Transferring Between an Aerial Device and a Structure - Transfers between an aerial device and a structure are discouraged. When transfers between a single or multiple occupancy aerial device and an aerial ladder, cable cart, or other equipment are required, they shall be in accordance with the following procedure:

- Buckets and platforms shall be positioned to remain stable during a transfer. The platform or bucket shall have a fixed-pin or a locking mechanism to provide stability during transfer.
- The transfer shall be made from the aerial device by a door, step, or secured ladder designed solely for the purpose of assisting the worker over the rim of the bucket or platform. Portable ladders shall not extend beyond the rim of the bucket. Portable ladders shall be removed from the bucket after the worker returns to the bucket. Platform guardrail systems must meet the design requirements per 29 CFR 1910.27, (Fixed Ladders).
- The aerial device shall be attended at all times when employees are transferring from or to the aerial device. The aerial device shall be considered attended as long as a qualified operator remains at the controls either in the bucket or at ground level. The climber and the operator shall remain in voice and/or visual contact at all times when a climber is aloft. While a climber is working aloft and not transitioning to another area, the operator may work on other jobs at the site provided the operator is available when needed at the controls.
- A climber transitioning between an aerial device and a structure shall be attached to the structure with both feet on the floor of the bucket or platform prior to making the transfer. The employee shall not be connected to the aerial device while attaching to the structure. The unattached time shall be kept to a minimum.
    - There shall be a second qualified climber present at the location when a transition is performed.

COMMUNICATIONS STRUCTURE REQUIREMENTS

Towers

Fixed Ladders - When provided, fixed ladders shall be used for ascending and descending communications structures, except where work assignments or conditions dictate otherwise.

When safe climb devices are available and operational, they shall be used to ascend and descend a communications structure.

Transitioning to the work position shall be accomplished while maintaining **100% attachment (100% Tie-Off/100% Connection)** using a full body harness and lanyard or lifeline in conjunction with an energy- absorbing or self-retracting lanyard or lifeline.

In situations where a safe climb device is not available or not operational and climbing has been determined necessary, qualified climbers will be allowed to climb while maintaining **100% attachment (100% Tie-Off/100% Connection)** to a suitable anchorage point.

One hundred percent attachment is not required while utilizing approved work platforms, having guardrails and kickboards in accordance with 29 CFR 1910.23 and 1910.24.

Portable Straight or Extension Ladders - Portable straight or extension ladders shall be placed at an angle that will not permit slippage (minimum standard is the 4:1 ratio) of the ladder base when climbing. Unsecured ladders shall be supported by a ground worker until the climber has secured (tied) the ladder and transferred to the structure. (Reference 29 CFR 1910. 25 (Portable Wood Ladders) and/or 29 CFR 1910.26 (Portable Metal Ladders).

Pole Structures - All pole communication structures that will be climbed shall be equipped with a safe climb device. When climbing on step bolts, fixed ladders, or moving between work or rest positions, climbers shall maintain 100% attachment.

Wood Pole Structures - Wood pole structures are not authorized for use as radio communications structures and will not be climbed. Where pole structures are still in use, an aerial device will be used to perform all work on the antenna system.
Roof Top and Miscellaneous Structures - Any telecommunications work performed by an employee positioned on a horizontal or vertical surface with an unprotected side or edge which is four (4) feet or more above a lower level, shall be protected from falling by use of guardrail systems, safety net systems, or personal fall arrest systems. Roof tops are considered elevated working surfaces and require the employee to be tied off to an anchorage point that will withstand 5,000 pounds per person or the maximum anticipated impact load times an OCF of at least 2.0 for one worker (Reference 29 CFR 1926 Subpart M).

Pre-Climb and Rescue Procedures
General - An initial risk assessment will be completed on each structure.

Approval (written or verbal) of the RA, by the appropriate authority must be given prior to climbing a structure. Based on the level of residual risk, the immediate supervisor may not have the authority to accept the risk for the operation. A vital step in the RA will be rescue procedures and

equipment to be used in the event of an incident. This procedure will be documented on the RMW for that structure.

The rescue procedure shall provide prompt rescue of employees or a means of self- rescue (e.g. providing controlled descent device, radio, etc.). A site safety briefing shall be held at the beginning of each day, job, or change in work procedure to review the potential hazards involved in the work to be performed and potential rescue methods available. These discussions will help to ensure the availability of proper rescue equipment and to facilitate quick rescue of the worker.

Rescue of fall victims shall be included in all training and job planning. Aerial devices, cranes, hand lines (lifelines), or another device capable of lifting the climber should be readily available.

Manufacturer's recommendations shall be followed for the inspection, use, and maintenance of all PPE and safety equipment.

Only PPE certified by the manufacturer to meet all OSHA standards and regulations is authorized for use. No personal owned or home-built, or company-built equipment will be used in place of OSHA compliant PPE.

Safety and Health Precautions
Employees shall not be assigned to work in hazardous areas/activities except in pairs, and always with established communications. Tower climbing will only be performed by qualified climbers and in pairs.

Radio Station Deactivation's 29 CFR 1910.97 (Nonionizing Radiation) and 29 CFR1910.268 (Telecommunications). As per OSHA Regulations 29 CFR 1910.97 (Nonionizing Radiation), climbers shall not be permitted to work on antenna systems connected to live radio transmitters nor be exposed to hazardous levels of electromagnetic radiation (radio frequency energy). Maintenance procedures require notification and coordination with the affected radio system dispatchers. Coordination with dispatchers shall include an estimated time for radio system reactivation on the structure being serviced. As work may need to be accomplished where nearby transmitters are active, a personal RF monitor should be worn to identify any hazardous levels of electromagnetic radiation.

Medical Services and First Aid, 29 CFR 1910.151. All employees whose work assignment in the field places them beyond reasonable access to a medical facility in terms of time and distance (15 minutes and/or 10 miles) must be adequately trained to render first aid. All climbers shall have a current certificate in first aid and CPR before accepting field assignments.

Medical Condition of the Climber - A climber that is ill and/or on medication which may inhibit actions or cause over stimulation, dizziness, drowsiness, etc., will not climb. Any observed adverse physical conditions of any team member should be reported to the onsite job supervisor.

Any climber that exhibits an adverse physical condition that prevents them from functioning as a climber, shall not function as a ground safety person. This adverse physical condition will prevent them from performing a rescue.

Electrical Power lines 29 CFR 1910.335 (Working Near Energized Equipment); climbers who will work within 10 feet of electrical power lines or service drop shall inform the utility company. They shall request the utility company to de-energize, move, cover, or barricade the exposed energized source.

Training and Qualifications
General - Climbers will be trained in the principles of; fall protection, use and care of a full body harness, safety-climbing devices, tower climbing, transferring between equipment and structures, and rescue techniques. Climbers will also be trained in recognizing emergencies and how to select and use the appropriate rescue equipment and the proper technique for the situation.

Workers shall be trained in the selection and use of PPE, fall protection and rescue equipment and their application limits, proper anchoring, tie-off techniques, proper rigging practices, determination of elongation and deceleration distance, methods of use, and inspection and storage of the system. Methods to identify energized power lines, apparatus, other auxiliary equipment on the tower, and to be knowledgeable of the rules applicable to work on and around the structure near energized power lines. Workers shall become familiar with manufacturer's recommendations, reduction in strength caused by certain tie-offs, and the maximum allowed free fall distance and total fall distance.

Employees who will be expected to perform rigging or hoisting activities should have specialized training to ensure they can safely perform these tasks.

Emergency Care Courses - Qualified climbers will have a current First Aid and CPR certificate.

Medical Qualification - Prior to attending training, climbers will pass a medical standards examination

Documentation - Shall consist of a certificate indicating that the individual has successfully completed the course of instruction and has the skills required to be proficient in the Tower Climbing and Fall Protection Program requirements in this handbook. Demonstrated proficiency shall be included in the documentation. Documentation shall be made when the employee successfully completes the training. The documentation shall be retained and maintained in by the Safety Officer **Joaquin Blas.** Training records will be maintained for the duration of the worker's employment.

Recertification

General - A "Qualified Climber" must maintain proficiency in climbing by demonstration and also must receive periodic training as new CPR/First-Aid, safety equipment, climbing procedures and techniques are continuously developed. The recertification involves an annual review, by the Program Coordinator, of the climber's record to determine when a climb was last performed.

If a climber is deficient in the medical qualification and meets all other requirements, then he or she can be recertified after completing a medical examination by a medical officer and an entry is made in their climbing record.

Documentation

All climbing training certificates and recertification statements concerning a climber shall be maintained for the duration of the worker's employment. The records must be kept by the Safety Officer with a courtesy copy sent to the Safety Manager.

WARNING LINES

Warning Lines serve as visual reminders of the defined work area, clearly marking areas where workers do not belong.

General Industry Warning Line Requirements

When The Company uses a designated area, the following must be ensured:

- Employees remain within the designated area while work operations are underway; and
- The perimeter of the designated area is delineated with a warning line consisting of a rope, wire, tape, or chain that meets the requirements listed below.

The Company must ensure each warning line:

- Has a minimum breaking strength of 200 pounds (0.89 kN);
- Is installed so its lowest point, including sag, is not less than 34 inches (86 cm) and not more than 39 inches (99 cm) above the walking-working surface;
- Is supported in such a manner that pulling on one section of the line will not result in slack being taken up in adjacent sections causing the line to fall below the limits specified in paragraph (d)(2)(ii) of this section;
- Is clearly visible from a distance of 25 feet (7.6 m) away, and anywhere within the designated area;
- Is erected as close to the work area as the task permits; and
- Is erected not less than 6 feet (1.8 m) from the roof edge for work that is both temporary and infrequent, or not less than 15 feet (4.6 m) for other work.

When mobile mechanical equipment is used to perform work that is both temporary and infrequent in a designated area, The Company must ensure the warning line is erected not less than 6 feet (1.8 m) from the unprotected side or edge that is parallel to the direction in which

the mechanical equipment is operated, and not less than 10 feet (3 m) from the unprotected side or edge that is perpendicular to the direction in which the mechanical equipment is operated. (1910.29)

Construction Warning Line Requirements

Warning line systems and their use shall comply with the following provisions:

- The warning line shall be erected around all sides of the roof work area.
- When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge.
- When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.
- Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.
- When the path to a point of access is not in use, a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area, or the path shall be offset such that a person cannot walk directly into the work area.

Warning lines shall consist of ropes, wires, or chains, and supporting stanchions erected as follows:

- The rope, wire, or chain shall be flagged at not more than 6-foot (1.8 m) intervals with high-visibility material;
- The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (.9 m) from the walking/working surface and its highest point is no more than 39 inches (1.0 m) from the walking/working surface;
- After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion, 30 inches (.8 m) above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (2.22 kN), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in paragraph (f)(2)(iii) of this section; and
- The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

No employee shall be allowed in the area between a roof edge and a warning line unless the employee is performing roofing work in that area. (1926.502)

PERSONNEL HOISTING

No more than two employees may be hoisted on load line at one time (effective 3/26/02)

Pre-lift meeting reviews procedures and appropriate requirements in this guideline (CPL 2-1.36)

Equipment for personnel hoisting:

- Anti-two-block device used on all hoists
- Rigging, hoist line and slings shall have factor of 10/1
- Hoist line used to raise or lower employees equipped with swivel
- Spin-resistant wire rope prohibited
- When hoisting personnel, the hoist capacity load rating de-rated by a factor of 2 (reduced by half)
- All employees provided with and required to use proper PPE, which inspected before each use
- Guide line used except where employer can demonstrate specific circumstances or conditions to preclude use
- Gin poles thoroughly inspected by competent person before each use to determine they're free of defects, including but not limited to:
  - Damaged and/or missing members
  - Corrosive damage
  - Missing fasteners
  - Broken welds at joints
  - General deterioration
- Gin pole attached to tower as designed by RPE, and minimum of two attachment locations at bottom and near top
- Personnel load and material capacities of lifting system in use posted onsite near hoist operator's location

All trial lifts, inspections and proof tests shall be documented and documentation can be found onsite.

Except where demonstrated that its use is precluded, a personnel platform must be used to hoist more than one employee to work station.

When a Bostswain's seat-type or full body harness used to hoist employees, the following applies:

- No more than two employees at a time
- Harness attached to hook by lanyard
- Only locking type snaphooks used

- Harness equipped with two side rings and at least one front and one back D ring

The hoist line hook shall be equipped with safety latch which can be locked in a closed position.

The use of free-spooling (friction lowering) is prohibited.

When the hoist line is being used to raise or lower employee(s), no other load shall be attached to the hoist line. Also, no other load shall be raised or lowered at same time on same hoist.

Gin pole raising lines are not to be used to raise or lower employees.

All employees must maintain 100% tie off when moving between hoist line and tower.

Maximum rate of travel shall not exceed 200 feet per minute when guide line used to control personnel hoists.

When guide line cannot be used, rate of hoisted employee's travel shall not exceed 100 feet per minute.

In all personnel hoist situations, maximum rate shall not exceed 50 feet per minute when personnel being lifted approach within 50 feet of top block.

Communications During Lifting Operations

- Employees being hoisted shall remain in continuous sight of and/or in direct communications with operator or signal person
- When radios used, they shall be non-trunking, closed 2-way selective frequency systems
- When hand signals used, employees must use industry standard hand signals

RIGGING

At a minimum, all construction activities on communication structures involving cranes shall include direct communication with the crane company and/or operator to establish rigging plan requirements and key designated personnel to ensure individual roles and responsibilities are fully understood.

At a minimum, designated key personnel, where applicable, shall include the crane operator, signal person, spotter and qualified rigger(s) responsible for attaching and detaching the lifted loads from the crane's hook.

The language in the standard regarding personnel riding the load line on a base mounted hoist is specific to this standard and does not apply to any other industry or standard.

Inspection

Visual inspection of the hoist, rigging, base support and foundation shall be made by a company appointed competent person immediately after the trial lift to determine whether testing has exposed any defect or adverse effect upon any component of the structure.

Any defects found during the inspection which may create a safety hazard shall be corrected, and another trial lift shall be performed before hoisting personnel.

Prior to hoisting employees and after any repair or modification, the personnel rigging shall be proof tested to 125% of the greatest anticipated load by holding it in a suspended position for five minutes with the test load evenly distributed (this may be done concurrently with the trial lift).

After proof testing, the company appointed competent person shall inspect the rigging. Any deficiencies found shall be corrected and another proof test shall be conducted.

Rigging Plans

A systematic and detailed presentation showing the equipment and procedures required for construction that will provide for the safety of personnel and for the stability of the structure and lifted components.

All Rigging Plans must be prepared by Qualified Person and/or Competent Rigger.

Class I Rigging Plans

"Minimum" Required Class For The Following:

- Gross lift loads for lift systems attached to the structure shall not exceed 350 lbs. (excludes cranes or other lifting systems not attached to structure)
- Construction activities do NOT adversely impact the strength or stability of the supporting structure and SOW does not require any special, custom, or unique construction methods.

Class II Rigging Plans

"Minimum" Required Class For The Following:

- Gross lift loads for lift systems attached to the structure shall not exceed 500 lbs. (excludes cranes or other lifting systems not attached to structure)
- Construction activities do NOT adversely impact the strength or stability of the supporting structure and SOW does not require any special, custom, or unique construction methods.

Class III Rigging Plans

"Minimum" Required Class For The Following:

- Gross lift loads for lift systems attached to the structure shall not exceed 2,000 lbs. (excludes cranes or other lifting systems not attached to structure)
- All new structure and foundation construction
- All construction activities involving cranes or other lifting devices not attached to structure
- Construction activities do NOT adversely impact the strength or stability of the supporting structure and SOW does not require any special, custom, or unique construction methods.

Class IV Rigging Plans

- Any planned lift exceeding 2,000 lbs where the rigging system is directly attached to structure (excludes cranes or other lifting systems not attached to structure)
- Removal of structural members, or any activities involving reduced supporting structure strength or stability (i.e. structural member removal/replacement, guy wire installation/removal/replacement, significant foundation work impacting stability, etc.)
- Removal of unique appurtenances where either imposed construction loading, or
- supporting structure strength/stability is questioned by Contractor
- SOW involves custom or infrequent construction methods
- Special engineered lifts
- Unique situations
- All tower decom/demolition
- Prepared by Competent Rigger and/or Qualified Person with a Qualified Engineer

Fall Protection Work Plan

EMERGENCY RESPONSE PLAN

If a worker falls and is suspended by a safety harness, implement the emergency response plan by following the steps below. Note: It's important to know your role.

- Take control of the situation. Use your training.
- Sound an emergency alarm—all workers in the immediate vicinity of the incident stop working. Quickly evaluate the situation and identifies any further hazards that could arise.
- Call 911
- Give exact location of the tower, address, coordinates or direction.
- The site supervisor (or assigned person) isolates the accident zone and its perimeter.
- Send a designated worker to the site gate or access road gate to meet the response team.
- Assemble the emergency rescue team at the accident site to determine the best rescue procedure.

RESCUE PROCEDURES

The following rescue procedures are ordered (A) through (D), with (A) being the preferred method and (D) being the method used when there is no other means of rescue. See company safety manual for details.

- Elevating Work Platform Rescue—If an elevating work platform (EWP) is available on or near the site and the suspended worker can be reached by the platform.
- Ladder Rescue—If an elevating work platform is not available, use ladders to rescue the fallen worker.
- Rescue from Work Area or Floor Below—If the fallen worker is suspended near a work area and can be safely reached from the floor below or the area from which they fell.
- Tower Rescue—If a worker has fallen and is suspended in an inaccessible area or height, you need to perform a rescue using fisk descender or ID Petzl descender.
    - Make sure preferred methods A, B, and C are not possible.
    - Notify the 911 operator right away to the possibility of a tower rescue. Relay how many people will be doing the tower rescue and the condition of the person being rescued.
    - Rig a controlled descent load line above and as close as possible the injured person.
    - Rig a second lifeline to a separate anchor point on the tower, next to the controlled descent line.
    - Attach the rescuer from his D-ring to a rope grab on the lifeline.
    - Connect the rescuers descending device to the load line and move into place behind the injured person.
    - Attach a self-locking carabineer to the back-D ring of the injured person. Attach this carabineer to the controlled descending device.
    - Remove the injured person from his fall arrest or suspension device and lower safely to the ground.
    - Once the fallen worker has been brought to a safe location, administer first aid.
    - Arrange transportation to hospital. A designated worker must accompany the injured worker to hospital.

CARE OF INJURED PERSONNEL

- Attention given an injury will depend on the extent of the injuries. Superficial wounds can be treated with the First Aid Kit issued. Competent medical personnel will treat any injury, which impairs the individual's capacity to function. The injured will be removed from the site not to return in a working capacity until advised by a physician and by management.
- Upon injury; determine the extent of injury, treat all life-threatening wounds as far as training will allow and summon help by whatever means available. Coordination should be through emergency services.

- If the injured is on the tower and unable for any reason to move voluntarily to the ground, the injured must be given first aid and made comfortable as possible. Determine the extent of injury, treat life-threatening wounds and secure the injured to the tower. Summon assistance through 911.
- Be aware of your own physical state, it will not serve the injured if you become disabled through fatigue.
- In urban and suburban areas, the most likely transport for the severely injured will be by ambulance. Less severely injured can be transported by vehicle to the nearest emergency medical facility.
- In rugged terrain, Medivac or MAST helicopter should handle evacuation of severely injured personnel. Less severely injured will be transported by appropriate vehicle.

DEFINITIONS

Aerial device - Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated work position.

Anchorage - An OSHA required means of attachment to which the fall protection system is connected.

Attachment - A device such as a tie, band, or fastening that joins one thing to another.

Body belt - A belt that consists of a belt strap and D-rings and may include a cushion section or a tool saddle. *Note: As of January 1, 1998, the body belt is no longer permitted as a fall protection device.*

Carabiner - A connector component generally comprised of a trapezoidal or oval shaped body with a normally closed gate or similar arrangement that may be opened to permit the body to receive an object, and when released, automatically closes to retain the object.

There are generally three types:

- The self-locking type (preferred) with a self-closing, self-locking gate which remains closed and locked until intentionally unlocked and opened for connection or disconnection; or
- The non-locking type (not recommended) with a self-closing gate which remains closed, but not locked, until intentionally opened by the user for connection or disconnection; or
- The manual locking type (not recommended) with a self-closing gate, which remains, closed but not locked (unless purposely locked by the user) until intentionally opened by the user for connection or disconnection.

Certification - State of being certified and holding a license or certificate, which assures that a climber, has successfully completed the required and approved training or refresher courses.

Climber Fall Zone -The area 9.5 feet below the anchorage point into which a climber would fall if he/she fell from the structure.

Climbing - The vertical (ascending and descending) and horizontal movement to access the elevated work position. See Transferring and Transitioning. A climber must be mechanically attached during all climbing, work, or rest activities.

Competent person - One who, because of training, experience, and authority, is capable of identifying and correcting hazardous or dangerous conditions in the personal fall arrest system or any component thereof under consideration, as well as its application and use with related equipment.

Deceleration device - Any mechanism, which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy, imposed on an employee during fall arrest.

Deceleration distance - The additional vertical distance a falling worker travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of a full body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the worker comes to a full stop 3.5 feet (1.1 m maximum).

Drop zone - The area around a tower/structure in which items will likely land if dropped from overhead. This zone is defined as .5 feet out from the structure base for every foot in elevation above the base of the structure.

Energy (shock) absorber - A component whose primary function is to dissipate energy and limit deceleration forces on the body during fall arrest. Such devices may employ various principles such as deformation, friction, tearing of materials or breaking of stitches to accomplish energy absorption. An energy absorber causes an increase in the deceleration distance.

Engineered anchorage - A fall protection anchorage point which is designed and will operate to withstand the maximum expected impact load while maintaining a specified overload capacity factor (OCF) of two.

Engineered system - A fall protection system that is designed to absorb the energy of a worker(s) during a fall while accommodating the static loads of tools and hardware. See Fall Protection System.

Fall arrest system - The assembly of equipment such as a full body harness in conjunction with a deceleration device and anchorage to limit the forces a worker experiences during a fall from one elevation to another.

Fall prevention system - A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning device systems, guardrail, barriers, and restraint systems. Fall prevention systems are used in an attempt to prevent workers from falling from an elevation. It should be noted that these devices do not absolutely prevent a worker from falling; their function is to keep the worker at the same elevation.

Free fall distance - The vertical displacement of a fall arrest attachment point on the climber's full body harness 6 feet (1.9 m maximum) between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, lifeline, and lanyards elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Full body harness - A component with a design of straps which is fastened about the worker in a manner so as to contain the torso and distribute the fall arrest forces over at least the upper thighs or buttocks, pelvis, chest, and shoulders with means for attaching it to other components or subsystems. NOTE: Wherever the word "harness" is used by itself in this handbook, it refers to full body harness unless otherwise specified.

Hazard - Anything that can potentially endanger personnel, impedes safe working conditions, and conceivably causes injury, or loss of life.

Job site - The assembly point at the structure or equipment where the workers, tools, and vehicles are assembled to perform the climbing to the work position.

Lanyard - A flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body or body harness to a deceleration device, lifeline, or anchorage.

Overload Capacity Factor (OCF) - The number by which a maximum load is multiplied to assure that the system does not fail when loaded to the design load.

Portable ladders - Portable ladders are those that are not permanently installed to a structure but are the normal means of accessing the facilities on the structure as well as the structure itself.

Positioning strap - A strap with snap hook(s) to connect to the D-rings of a climber's full body harness. Used as a positioning device (also known as pole strap or safety strap).

Qualified climber - A worker who has been certified through approved training, satisfies medical qualifications, has a current CPR/First Aid certificate and proficient in the RA process, understands the methods, and has routinely demonstrated proficiency in climbing.

Roll-out - A movement process by which a snap hook or carabiner accidentally disengages from an anchorage or object to which it is coupled.

Self-retracting lanyard/lifeline - A device that contains a drum-wound web lanyard or steel line that may be slowly extracted from or retracted onto the drum under slight tension during normal movement of the user. The line has means for attachment to the fall arrest attachment on the body support. After onset of a fall, the device automatically locks the drum and arrests the fall. The device may have integral means for energy absorption.

Snap hook - A connector comprised of a hook-shaped member with a normally closed keeper or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are to be the self-locking type with a self-closing, self-locking keeper, which remains, closed and locked until unlocked and pressed open for connection or disconnection (two distinct operations are required to open a locking type snap hook). Non-locking and manual locking snap hooks are prohibited.

Total fall distance - The maximum vertical distance between the person's position before a fall and after the fall is arrested. The total fall distance includes maximum free fall distance plus maximum deceleration distance. Total fall distance excludes dynamic elongation.

Transferring - The act of moving from one distinct object to another (e.g., between an aerial device and a structure).

Transitioning -The act of moving from one location to another on equipment or a structure while going around or over an obstruction.

Work position - The elevated location on the structure or equipment where the worker is in position to perform the assigned work or task

Fall Protection Safety Audit Form

BASIC TOWER INFORMATION

Fill out every field in the following table.

Site Information	
Tower Site Name:	
Date:	
Tower Site Address or Coordinates:	
Job Leader:	
Climber and Ground Crew:	
Name and Address of Local Hospital:	
EMS Phone Number:	

PRE-JOB SITE SAFETY INSPECTION

Circle one of the following for each line item in this list.

Safety Audit Item	Yes	No	N/A
Safety Cable Present	Yes	No	N/A
Tower Inspected	Yes	No	N/A
Emergency Plan Reviewed	Yes	No	N/A
Rescue Plan Reviewed	Yes	No	N/A
GUY Anchors Inspected	Yes	No	N/A
Overhead Protection required (other than hard hat)	Yes	No	N/A
Tower Inspection Discrepancies:	Yes	No	N/A

FALL PROTECTION EQUIPMENT AND CLIMBING SAFETY

Circle one of the following for each line item in this list.

Change	Yes	No
Fall Protection Equipment Inspected	Yes	No
Lanyards with Locking Snap Hooks	Yes	No
Hard Hat	Yes	No
First Aid Kit Present	Yes	No
Fisk Descender I ID Rescue Kit on site	Yes	No
Safety Equipment Inspected	Yes	No

Pacific Northwest Towers employees must ensure 100% tie-off practice at all times for the climber and equipment. This requirement is mandatory for all climbing situations and will be strictly enforced.

WEATHER CONDITIONS

Enter weather condition in the box below.

Weather

This Fall Protection Work Plan (on both pages) has been reviewed before the start of climbing activity. Note that mandatory signatures are required for both climber and ground crew. This requirement is for all climbing situations and will be strictly enforced.

Name Climber:_____

Signature: _____

Name Climber:_____

Signature: _____

Ground Crew:_____

Signature: _____

Ground Crew:_____

Signature: _____

Trenching with Damage Prevention

PURPOSE

To outline procedures for the protection of employees working in and around excavations and trenches for **Pacific Northwest Towers**; hereafter referred to as "The Company." This program is written in accordance with OSHA CFR 1926.651 and pertains to all The Company projects that require any excavations or trenching work.

RESPONSIBILITIES

It is the responsibility of each superintendent and supervisor to implement and maintain the procedures and steps set forth in this program.

Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this program.

HAZARDS

One of the reasons the company requires a competent person on-site during excavation and trenching are the numerous potential hazardous that may be encountered or created. Hazards include:

- Electrocution
- Gas Explosion
- Entrapment
- Struck by equipment
- Suffocation

EXCAVATION STATEMENT

The Company shall provide a commitment to safe digging practices by determining underground instillations BEFORE any excavation. This can be accomplished by either contacting the local utility companies or the local "one-call' center for the area. All underground utility locations must be documented on the proper forms. All overhead hazards (surface encumbrances) that create a hazard to employees must be removed or supported to eliminate the hazard. Any additional applicable state and local laws related to excavations will be followed as well.

Joaquin Blas
(Safety Manager)

UTILITIES AND UNDERGROUND INSTALLATIONS

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.

The Company shall ensure 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 Company may proceed, provided The Company does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

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

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

ACCESS AND EGRESS

Structural Ramps

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.

Ramps and runways constructed of two or more structural members shall have the structural members connected to prevent 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 lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

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.

Exposure to Vehicular Traffic

The Company shall ensure 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.

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, to provide adequate protection for the operator during loading and unloading operations.

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.

HAZARDOUS ATMOSPHERES

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:

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

- 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

EMERGENCY RESCUE EQUIPMENT

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.

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a life-line 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.

PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

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.

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.

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.

STABILITY OF ADJACENT STRUCTURES

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

PROTECTION OF EMPLOYEES IN EXCAVATIONS

Each employee in an excavation shall be protected from cave-ins by an adequate protective system when:

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

Design of Sloping and Benching Systems

The slopes and configurations of sloping and benching systems shall be selected and constructed by The Company or The Company designee and shall be in accordance with this standard, as follows:

- **Option (1) - Allowable Configurations and Slopes**
  - 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
  - Slopes shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in appendix B to this subpart
- **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
- **Option (3) - Designs Using Other Tabulated Data**
  - Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts
  - The tabulated data shall be in written form and shall include all the following:
    - Identification of the parameters that affect the selection of a sloping or benching system drawn from such data
    - Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe

        - Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data
- **Option (4) - Design by a Registered Professional Engineer**
    - Sloping and benching systems not utilizing Option (1), (2), or (3) shall be approved by a registered professional engineer
    - Designs shall be in written form and shall include at least the following:
        - The magnitude of the slopes that were determined to be safe for the particular project
        - The configurations that were determined to be safe for the project
        - The identity of the registered professional engineer approving the design

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.

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.

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 Company or The Company designee.

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 section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

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

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

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.

Option (3) - Designs Using Other Tabulated Data

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

- Identification of the parameters that affect the selection of a protective system drawn from such data
- Identification of the limits of use of the data
- Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data

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.

Option (4) - Design by a Registered Professional Engineer

Support systems, shield systems, and other protective systems not utilizing Option (1), (2), or (3), above, shall be approved by a registered professional engineer. Designs shall be in written form and shall include the following:

- A plan indicating the sizes, types, and configurations of the materials to be used in the protective system
- The identity of the registered professional engineer approving 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, but a copy of the design shall be made available to the Secretary upon request.

MATERIALS AND EQUIPMENT

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

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.

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.

INSTALLATION AND REMOVAL OF SUPPORT

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

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.

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

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.

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.

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

Additional Requirements for Support Systems for Trench Excavations

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.

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

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.

Shield Systems

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

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.

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

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

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.

HAZARD CONTROLS

Before any work is performed and before any employees enter the excavation, several items must be checked and insured:

- If the excavation is to be over 20 feet deep, it must be designed by a registered professional engineer who is registered in the state where work will be performed.
- Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding.
- The worksite must be analyzed to design adequate protection systems and prevent cave-ins. There must also be an excavation safety plan developed to protect employees.
- Workers must be supplied with and wear any personal protective equipment deemed necessary to assure their protection.
- All spoil piles will be stored a minimum of four (4) feet from the sides of the excavation. The spoil pile must not block the safe means of egress.
- If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel any more than 25 feet of lateral travel to reach the stairway, ramp, or ladder.
- No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees.
- Employees must be protected from water accumulation, including the use of shields, and must be inspected by a competent person before work begins.
- A competent person will inspect all excavations and trenches daily, prior to employee exposure or entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate all hazards.
- Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. If the atmosphere is inadequate, protective systems will be utilized.
- If work is in or around traffic, employees must be supplied with and wear orange reflective vests. Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians.

- Railings and guardrails will be utilized to protect against falls.
- Walkways to be provided where employees or equipment are required or permitted to cross over excavations.
- Guardrails required where walkways are six feet or more above lower levels.

COMPETENT PERSON RESPONSIBILITIES

The OSHA Standards require that the competent person must be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and have authorization to take prompt corrective measures to eliminate them and, if necessary, to stop the work.

Competent persons should examine the possibility of cave-ins, failures or protective systems, etc. If problems are found, provisions should be made for immediate personnel removal.

The Competent Person should be specified, and his duties described. Duties might include inspections prior to entry, atmospheric testing, removal of workers if conditions dictate.

A Competent Person will provide certification to verify that they have been provided tools/training to carry out excavation responsibilities.

A Competent Person is required to:

- Have a complete understanding of the applicable safety standards and any other data provided.
- Assure the proper locations of underground installations or utilities, and that the proper utility companies have been contacted.
- Conduct soil classification tests and reclassify soil after any condition changes.
- Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection.
- Conduct all air monitoring for potential hazardous atmospheres.
- Conduct daily and periodic inspections of excavations and trenches.
- Approve design of structural ramps, if used.

EXCAVATION SAFETY PLAN

An excavation safety plan is required in written form. This plan is to be developed to the level necessary to ensure complete compliance with the OSHA Excavation Safety Standard and state and local safety standards.

Excavation Safety Plan Factors

- Utilization of the local one-call system
- Determination of locations of all underground utilities

- Consideration of confined space atmosphere potential
- Proper soil protection systems and personal protective equipment and clothing
- Determination of soil composition and classification
- Determination of surface and subsurface water
- Depth of excavation and length of time it will remain open
- Proper adherence to all OSHA Standards, this excavation and trenching safety program, and any other coinciding safety programs

DAMAGE PREVENTION

Incident Investigation

All incidents must be reported and investigated. The investigation must be thorough and seek to identify the events that contributed to causing the incident, the parties involved, the extent of the damage that occurred, and any other information that may be relevant.

Incident Reporting

Reporting all incidents must include all necessary levels of management.

All incidents that result in any damage to any buried infrastructure (for example: gas lines, electric cables, or sewage systems) must be reported to the appropriate agency within the appropriate timeframe (AGA, DIRT,CGA, API, etc.).

The appropriate agency will vary by location of the incident.

Stop Work Authority

All employees have the authority and obligation to stop any task or operation where concerns or questions regarding the control of HSE risk exist.

Corrective Action Plan

The Company shall have a corrective action plan to identify solutions that will make future excavations safer after an incident occurs. The corrective action plan must address the performance of a root cause analysis to find the cause of an incident. The plan details how corrective actions are determined from that root cause analysis.

SOIL CLASSIFICATION AND IDENTIFICATION

The OSHA Standards define soil classifications within the Simplified Soil Classification Systems, which consist of four categories: Stable rock, Type A, Type B, and Type C. Stability is greatest in stable rock and decreases through Type A and B to Type C, which is the least stable. Appendix A of the Standard provides soil mechanics terms and types of field tests used to determine soil classifications.

Stable rock is defined as natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Soil classifications must be determined by testing and protective systems designed according to soil classifications.

Type A soil is defined as:

- Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater.
- Cemented soils like caliche and hardpan are considered Type A.

Soil is NOT Type A if:

- It is fissured.
- The soil is subject to vibration from heavy traffic, pile driving or similar effects.
- The soil has been previously disturbed.
- The material is subject to other factors that would require it to be classified as a less stable material.
- The exclusions for Type A most generally eliminate it from most construction situations.

Type B soil is defined as:

- Cohesive soil with an unconfined compressive strength greater than .5 TSF, but less than 1.5 TSF.
- Granular cohesionless soil including angular gravel, silt, silt loam, and sandy loam.
- The soil has been previously disturbed except that soil classified as Type C soil.
- Soil that meets the unconfined compressive strength requirements of Type A soil but is fissured or subject to vibration.
- Dry rock that is unstable.

Type C soil is defined as:

- Cohesive soil with an unconfined compressive strength of .5 TSF or less.
- Granular soils including gravel, sand and loamy sand.
- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.

SOIL TEST AND IDENTIFICATION

The competent person will classify the soil type in accordance with the definitions in Appendix A based on at least one visual and one manual analysis. These tests should be run on freshly excavated samples from the excavation and are designed to determine stability based on a number of criteria: the cohesiveness, the presence of fissures, the presence and amount of water, the unconfined compressive strength, the duration of exposure, undermining, and the presence of layering, prior excavation and vibration.

The cohesion tests are based on methods to determine the presence of clay. Clay, silt, and sand are size classifications, with clay being the smallest sized particles, silt intermediate and sand the largest. Clay minerals exhibit good cohesion and plasticity (can be molded). Sand exhibits no elasticity and virtually no cohesion unless surface wetting is present. The degree of cohesiveness and plasticity depend on the amounts of all three types and water.

When examining the soil, three questions must be asked: Is the sample granular or cohesive? Fissured or non-fissured? What is the unconfined compressive strength measured in TSF?

The location of underground installations shall be determined before excavation. When utility companies or clients cannot respond to a request to locate underground utility installations within 24 hours, or cannot establish 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.

EMPLOYEE PROTECTION FROM LOOSE SOIL AND ROCK

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.

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.

INSPECTIONS

Daily inspection of excavations, the adjacent areas and protective systems shall be made by the competent person for evidence of a situation that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.

- All inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift
- These inspections are only required when employee exposure can be reasonably anticipated
- Inspections will be made after every rainstorm or any other increasing hazard
- All documented inspections will be kept on file in the jobsite safety files and forwarded to the Safety Director weekly
- A copy of the Daily Excavation Inspection form is located at the end of this program.

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.

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.

METHODS OF TESTING SOILS

Visual Test

If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular.

Wet Manual Test

Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular.

Dry Strength Test

Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks.

Pocket Penetrometer Test

This instrument is most accurate when soil is nearly saturated. This instrument will give unconfined compressive strength in tons per square foot. The spring-operated device uses a piston that is pushed into a coil up to a calibration groove. An indicator sleeve marks and retains the reading until it is read. The reading is calibrated in tons per square foot (TSF) or kilograms per cubic centimeter.

Thumb Penetration Test

The competent person attempts to penetrate a fresh sample with thumb pressure. If the sample can be dented, but penetrated only with great effort, it is Type A. If it can be penetrated several inches and molded by light pressure, it is Type C. Type B can be penetrated with effort and molded.

Shearvane

Measures the approximate shear strength of saturated cohesive soils. The blades of the vane are pressed into a flat section of undisturbed soil, and the knob is turned slowly until soil failure. The dial is read directly when using the standard vane. The results will be in tons per square foot or kilograms per cubic centimeter.
The competent person will perform several tests of the excavation to obtain consistent, supporting data along its depth and length. The soil is subject to change several times within the scope of

an excavation and the moisture content will vary with weather and job conditions. The competent person must also determine the level of protection based on what conditions exist at the time of the test and allow for changing conditions.

Tests should be conducted for air contaminants (oxygen, flammable gases, etc. and provide ventilation where necessary.

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.

EXCAVATION PROTECTION SYSTEMS

The three basic protective systems for excavations and trenches are sloping and benching systems, shoring, and shields.

The protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to or transmitted to the system. Every employee in an excavation shall be protected from cave-ins by an adequate protective system.

Exceptions to using protective system:

- Excavations are made entirely in stable rock;
- Excavations are less than 5 feet deep and declared safe by a competent person.

Trench excavations shall have ramps, ladders, stairs, etc.; the means of egress must be within 25 feet of lateral travel for employees.

Employees should not work under loads of digging equipment where loads may fall.

Sloping and Benching Systems

There are four options for sloping:

1. Slope to the angle required by the Standard for Type C, which is the most unstable soil type.
2. The table provided in Appendix B of the Standard may be used to determine the maximum allowable angle (after determining the soil type).
3. Tabulated data prepared by a registered professional engineer can be utilized.
4. A registered professional engineer can design a sloping plan for a specific job.

Sloping and benching systems for excavations five (5) to twenty (20) feet in depth must be constructed under the instruction of a designated competent person.

Sloping and benching systems for excavations greater than twenty (20) feet must be designed and stamped by a registered professional engineer.

Sloping and benching specifications can be found in Appendix B of the OSHA Standard (Subpart P).

Shoring Systems
Shoring is another protective system or support system. Shoring utilizes a framework of vertical members (uprights), horizontal members (whales), and cross braces to support the sides of the excavation to prevent a cave-in. Metal hydraulic, mechanical or timber shoring is common examples.

The different examples of shoring are found in the OSHA Standard under these appendices:

APPENDIX C - Timber Shoring for Trenches

APPENDIX D - Aluminum Hydraulic Shoring for Trenches

APPENDIX E - Alternatives to Timber Shoring

Shield Systems (Trench Boxes)
Shielding is the third method of providing a safe workplace. Unlike sloping and shoring, shielding does not prevent a cave-in. Shields are designed to withstand the soil forces caused by a cave-in and protect the employees inside the structure. Most shields consist of two flat, parallel metal walls that are held apart by metal cross braces.

Shielding design and construction is not covered in the OSHA Standards. Shields must be certified in design by a registered professional engineer and must have either a registration plate on the shield or registration papers from the manufacturer on file at the jobsite office. **ANY REPAIRS OR MODIFICATIONS MUST BE APPROVED BY THE MANUFACTURER.**

Safety Precautions for Shield Systems
- Shields must not have any lateral movement when installed.
- Employees will be protected from cave-ins when entering and exiting the shield (examples - ladder within the shield or a properly sloped ramp at the end).
- Employees are not allowed in the shield during installation, removal, or during any vertical movement.

- Shields can be 2 ft. above the bottom of an excavation if they are designed to resist loads at the full depth and if there are no indications of caving under or behind the shield.
- The shield must extend at least 18 inches above the point where proper sloping begins (the height of the shield must be greater than the depth of the excavation).
- The open end of the shield must be protected from the exposed excavation wall. The wall must be sloped, shored, or shielded. Engineer designed end plates can be mounted on the ends of the shield to prevent cave-ins.

MATERIALS AND EQUIPMENT

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

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. 29 CFR 1926.652(d)

PERSONAL PROTECTION EQUIPMENT (PPE)

It is The Company policy to wear a hard hat, safety glasses, and work boots on the jobsite. Because of the hazards involved with excavations, other personal protective equipment may be necessary, depending on the potential hazards present (examples -goggles, gloves, and respiratory equipment).

TRAINING

Training must be conducted when workers are hired and at least annually after for those who have excavation responsibilities.

Training must cover applicable local rules related to:

- Digging,
- Including any tolerance zones,
- Ground markings,
- Or other relevant elements of safe digging to prevent the striking of a pipe.

The competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply (examples Hazard Communication, Confined Space, and

Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the programs and the hazards associated.

All other employees working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating.

DEFINITIONS

Benching - 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 - 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 failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent Person - 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.

Duration of Exposure - The longer an excavation is open, the longer the other factors have to work on causing it to collapse.

Excavation - Any man-made cut, trench, or depression in an earth surface, formed by earth removal.

Hazardous Atmosphere - 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.

Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from 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 necessary protection.

Shield - A structure that is capable of withstanding the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. All shields must be in accordance with 29 CFR 1926.652(c)3 or (c)4.

Sloping - A method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline

required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.

Surcharge Loads - Generated by the weight of anything in proximity to the excavation, push starts for a cave-in (anything up top pushing down). Common surcharge loads:

- Weight of spoil pile
- Weight of nearby buildings, poles, pavement, or other structural objects
- Weight of material and equipment

Trench - A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.

Undermining - Undermining can be caused by such things as leaking, leaching, caving or over-digging. Undermined walls can be very dangerous.

Vibration - A force that is present on construction sites and must be considered. The vibrations caused by backhoes, dump trucks, compactors and traffic on job sites can be substantial.

WORKER ACKNOWLEDGEMENT AND ACCOUNTABILITY

I, the worker, take ownership of my role and responsibilities in preventing incidents during excavations. Telling my supervisor or employer about equipment problems or other hazards that could hurt me or other workers. I have the right to refuse work that I believe endangers my health or safety-or the health or safety of others. Following The Company's instructions to use or wear equipment, protective devices, or clothing. Never engage in horseplay on site (pranks, competitions, showing off your strength, roughhousing, or unnecessary running).

_____
(Employee Name Print)

_____
(Employee Signature)

Welding, Cutting, and Brazing

PURPOSE

The purpose of this document is to outline the Welding, Cutting, Brazing safety policy for **Pacific Northwest Towers**; hereafter referred to as "The Company." Welding and hot work, such as brazing or grinding, present a significant opportunity for fire and injury. All precautions of this program must be applied prior to commencing any welding or hot work by company employees or contractors.

The Welding, Cutting, and Brazing policy only applies if within 35' of a hydrocarbon source.

RESPONSIBILITIES

Management

- Provide training for all employees whose task include heat, spark or flame producing operations such as welding, hot work, or grinding
- Develop and monitor effective hot work procedures
- Provide safe equipment for hot work
- Provide proper and effective PPE for all hot work

Supervisors

- Monitor all hot work operations
- Ensure all hot work equipment and PPE are in safe working order
- Allow only trained and authorized employees to conduct hot work
- Ensure permits are used for all hot work outside authorized areas

Employees

- Follow all hot work procedures
- Properly use appropriate hot work PPE
- Inspect all hot work equipment before use
- Report any equipment problems
- Never use damaged hot work equipment

HAZARDS

- Fires and Explosions
- Skin burns
- Welding "blindness"
- Respiratory hazards from fumes and smoke

TRAINING

Individuals performing welding/cutting must be suitably trained in the safe operations of their equipment and the safe use of the process.

Training shall include:

- Review of requirements listed in OSHA 1910.252
- Use of Hot Work Permit System
- Supervisor Responsibilities

FIRE WATCH

A fire watch is required when welding, cutting, hot work and/or soldering is performed near combustible materials and/or in locations where fire may develop.

Fire watchers shall have fire extinguishers readily available and will be trained in its use.

They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm.

A fire watch shall be maintained at least a half an hour after the welding or cutting operation was completed.

Fire Watch Responsibilities
The fire watch must know:

- That their ONLY duty is Fire Watch
- When they can terminate the watch
- How to use the provided fire extinguisher
- How to activate fire alarm if fire is beyond the incipient stage
- Facilities for sounding an alarm in the event of a fire.
- Operator Responsibilities
- Contractors Responsibilities
- Documentation requirements
- Respirator Usage requirements
- Fire Extinguisher training

Locations where other than a minor fire might develop:

- Combustible materials closer than 35 feet to point of operation
- Combustibles that are 35 feet or more away but are easily ignited
- Wall or floor openings within 35-foot radius expose combustible materials in adjacent areas Combustible materials are adjacent to the opposite side of metal partitions, ceilings or roofs and are likely to be ignited by conduction or radiation (29 CFR 1915.504)

- Where cutting or welding is done near walls, partitions, ceilings, or a roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition

If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be provided on the opposite side of the work.

Where practicable, all combustibles shall be relocated at least 35 feet from the work site. Where relocation is impracticable, combustibles shall be protected with flameproof covers or otherwise shielded with metal or asbestos guards or curtains.

Welding shall not be attempted on a metal partition, wall, ceiling or roof having a covering nor on walls having combustible sandwich panel construction.

Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion.

If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed.

If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards, shields, fire blankets, etc. shall be used to confine the heat, sparks and slag and to protect the immovable fire hazards.

Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by management
- In sprinkled buildings while such protection is impaired
- In the presence of potentially explosive atmospheres, e.g., a flammable
- In areas near the storage of large quantities of exposed, readily ignitable materials
- In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding/hot work will be conducted. All dust accumulation should be cleaned up following the housekeeping program of the facility before welding/hot work are permitted
-
- Suitable extinguishers shall be provided and maintained ready for instant use

Employees shall cease hot work operations if welding and cutting cannot be performed in a safe manner.

A fire watch person shall be provided during, and for, 2 hours past the completion of the welding project.

- A cutting/welding permit will be issued on all welding or cutting outside of the designated welding area.
- If fire hazards cannot be taken to a safe place or guards cannot be used to confine heat, sparks, slag and protect the immovable fire hazards, the welding/cutting shall not be performed.
- Operators of equipment should report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel.

WELDING AND HOT WORK FIRE PREVENTION MEASURES

A designated welding area should be established to meet the following requirements:

- Floors swept and clean of combustibles within 35 ft. of work area.
- Flammable and combustible liquids and material will be kept 35 ft. from work area.
- Adequate ventilation providing 20 air changes per hour, such as a suction hood system should be provided to the work area.
- At least one 10 lb. dry chemical fire extinguisher should be within access of the 35 ft. of work area.
- Protective dividers such as welding curtains or non-combustible walls will be provided to contain sparks and slag to the combustible free area.
- Requirements for welding conducted outside the designated welding area.
- Portable welding curtains or shields must be used to protect other workers in the welding area.
- A Hot Work Permit must be completed and complied with prior to welding operation.
- Before cutting or welding is permitted the area shall be inspected by position responsible for authorizing welding and cutting operations. He/she shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.
- Respiratory protection is mandatory unless an adequate monitored air flow away from the welder and others present can be established and maintained.
- Plastic materials be covered with welding tarps during welding procedures
- Fire Watch must be provided for all hot work operations.

Prohibited Areas

Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by management
- In sprinklered buildings while such protection is impaired
- In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously

contained such materials, or that may develop in areas with an accumulation of combustible dusts
- In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton

Relocation of Combustibles
Where practicable, all combustibles shall be relocated at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles shall be protected with flameproofed covers or otherwise shielded with metal or asbestos guards or curtains.

Ducts
Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.

Combustible Walls
Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

Noncombustible Walls
If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.

Combustible Cover
Welding shall not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

Pipes
Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

Management
Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property. Management shall:
- Based on fire potentials of plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas
- Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes
- Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process

- Advise all contractors about flammable materials or hazardous conditions of which they may not be aware

Supervisor

The Supervisor shall:

- Be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process
- Determine the combustible materials and hazardous areas present or likely to be present in the work location
- Protect combustibles from ignition
  - Have the work moved to a location free from dangerous combustibles.
  - If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.
  - See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.
- Secure authorization for the cutting or welding operations from the designated management representative
- Determine that the cutter or welder secures his approval that conditions are safe before going ahead
- Determine that fire protection and extinguishing equipment are properly located at the site

Where fire watches are required, the supervisor shall see that they are available at the site.

WELDING OR CUTTING CONTAINERS

Used containers. No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks, or other containers until they have been cleaned so thoroughly as to make certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipelines or connections to the drum or vessel shall be disconnected or blanked.

Venting and Purging

All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting, or welding. Purging with inert gas is recommended.

CONFINED SPACES

Accidental contact. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur, and the machine be disconnected from the power source.

Torch valve. To eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period, such as during lunch hour or overnight. Where practicable, the torch and hose shall also be removed from the confined space.

PROTECTING PERSONAL

Railing

A welder or helper working on platforms, scaffolds, or runways shall be protected against falling. This may be accomplished by the use of railings, safety belts, life lines, or some other equally effective safeguards.

Welding Cable

Welders shall place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

Eye Protection

Helmets or hand shields shall be used during all arc welding or arc cutting operations, excluding submerged arc welding. Helpers or attendants shall be provided with proper eye protection.

Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch hot work or for inspection.

All operators and attendants of resistance welding or resistance hot work equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

Eye protection in the form of suitable goggles shall be provided where needed for hot work operations.

COMPETENT PERSON

An OSHA "competent person" is defined as *"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"* [29 CFR 1926.32(f)]. By way of training and/or experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation and has the authority to correct them. Some standards add additional specific requirements which must be met by the competent person.

Before any employees are put in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems, they shall be instructed and judged by The Company before being left in charge they will have to be judged competent.

Special Precautions

Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed regarding cracks or holes in walls, open doorways and open or broken windows. [1910.252(a)(2)(i)]

HAZARD ASSESSMENT/PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.

Hazard analysis procedures shall be used to assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). Employees exposed to the hazards created by welding, cutting, or hot work operations shall be protected by personal protective equipment. The Company shall ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.

Goggles or other suitable eye protection shall be used during all gas and/or electric welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch hot work or for inspection.

The certifier's name, signature, date(s) will be present on the assessment documents.

If such hazards are present, or likely to be present, the following actions will be taken:

- Select, and have each affected Employee use, the proper PPE
- Communicate selection decisions to each affected employee

***Note:** Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds shall be used.

Fitting

Careful consideration must be given to comfort and fit. PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.

Reassessment of Hazards

The Safety Coordinator shall reassess the workplace hazard situation as necessary, by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.

Cleaning and Maintenance

It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision.

PPE should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection. It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards. [1910 Subpart I App B]

ELECTRIC WELDING

- Ensure fire extinguisher is charged and available.
- Ensure electrical cord, electrode holder and cables are free from defects (no cable splices are allowed within 10 feet of the electrode holder.
- Ensure PPE (welding hood and/or goggles, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- Ensure the frame or case of the welding unit is properly grounded.
- All defective equipment must be repaired or replaced before use.

Note: Welders designated to operate arc welding equipment shall have been properly trained, instructed and qualified to operate such equipment as specified in [29 CFR 1910.254(a)(3)] and [1910.252(a-c)].

Machine Hook Up

Before starting operations all connections to the machine shall be checked to make certain they are properly made. The work lead shall be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation. [1910.254(d)(2)]

Remove Flammables and Combustibles

- No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
- Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation).
- Ensure adequate ventilation and lighting.
- Execute Hot Work Permit procedures.

Set Voltage Regulator no higher than the following for:

- Manual Alternating Current Welders - 80 volts
- Automatic Alternating Current Welders - 100 volts
- Manual or Automatic Direct Current Welders -100 volts

Uncoil and spread-out welding cable.

To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not wrap welding cables around a body part and avoid welding in wet conditions).

Fire watch for one hour after welding and until all welds have cooled.

Perform final fire watch and terminate permit.

GAS WELDING

- Ensure tanks have gas and fittings are tight.
- Ensure fire extinguisher is charged and available.
- Ensure hoses have no defects.
- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- All defective equipment must be repaired or replace before use.

Remove Flammables and Combustibles

- No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
- Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation).
- Any welding, cutting or burning of lead base metals, zinc, cadmium, mercury, beryllium or exotic metals or paints not listed here shall have proper ventilation or respiratory protection.

COMPRESSED GAS CYLINDER SAFE HANDLING GUIDELINES

- Accept only cylinders approved for use in interstate commerce for transportation of compressed gases.
- Do not remove or change the marks and numbers stamped on the cylinders.
- Cylinders must never be dragged, pushed, or pulled across the floor.
- Transport cylinders weighing more than a total of 40 pounds (18.2 kg) on a hand or motorized truck, securing them from falling.

- Keep the cylinders clean and protect them from cuts or abrasions.
- Do not lift compressed gas cylinders with an electromagnet. Where cylinders must be handled by a crane or derrick, as on construction jobs, carry them in a cradle or suitable platform and take extreme care that they are not dropped or bumped. Do not use slings.
- Do not drop cylinders or allow them to strike each other violently.
- Do not use cylinders for rollers, supports, or any purpose other than to contain gas.
- Do not tamper with safety devices in valves or on cylinders.
- Consult the supplier of the gas when in doubt about the proper handling of a compressed gas cylinder or its contents.
- Clearly write EMPTY in chalk on empty cylinders that are to be returned to the vendor.
- Close cylinder valves and replace valve protection caps, if the cylinder is designed to accept a cap.
- Load cylinders to be transported to allow as little movement as possible. Secure them to prevent violent contact or upsetting.
- Always consider cylinders to be full and handle them with corresponding care.
- Securely support compressed gas cylinders at all times. Cylinders must not be left "free-standing" at any time, e.g., cylinders unloaded from truck to loading dock must be secured until placed on a hand truck for delivery within the building.
- Compressed gas cylinders should never be subjected to a temperature above 125 degrees F.
- Never place cylinders where they might become part of an electrical circuit.
- Do not re-paint cylinders.
- Never use a flame to detect flammable gas leaks - Always use soapy water.

MOVING AND STORING CYLINDERS

All gas cylinders will be kept inside buildings away heaters, radiators and other source of heat. Cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 feet (6.1 m) from highly combustible materials such as oil or excelsior. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways.

When cylinders are transported by powered vehicles, they shall be secured in a vertical position. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed, and valve protection caps put in place before cylinders are moved. A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

Oxygen Cylinders in Storage

Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet (6.1 m) or by a noncombustible barrier at least 5 feet (1.5 m) high having a fire-resistance rating of at least one-half hour.

All cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided. Cylinders containing oxygen or acetylene, or other fuel gas shall not be taken into confined spaces.

Treatment of Cylinders

Cylinders, whether full or empty, shall not be used as rollers or supports. No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by the owner of the cylinder shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the Department of Transportation requirements.

FUEL GAS AND OXYGEN MANIFOLDS

Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

Hose

Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used. All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

***Note:** Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

Oil and Grease Hazards

Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

Empty cylinders shall have their valves closed. Valve protection caps, where cylinder is designed to accept a cap, shall always be in place except when cylinders are in use or connected for use. [1910.253(b)(2)(ii)]

Valve Protection Caps

Valve protection caps shall be in place and secured for cylinder storage, moving and transporting. When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings. [1926.350(a)(1)]

Labeling and Identification of Compressed Gas Cylinders

WORKING IN CONFINED SPACES

Ventilation

Local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration.

Securing Cylinders and Machinery

When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement. [1910.252(b)(4)(iv)]

Lifelines

Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect. [1910.252(b)(4)(v)]

Electrode Removal

When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur, and the machine disconnected from the power source. [1910.252(b)(4)(vi)]

Gas Cylinder Shutoff

In order to eliminate the possibility of gas escaping through leaks of improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable the torch and hose shall also be removed from the confined space. [1910.252(b)(4)(vii)]

Warning Sign

After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

VEHICLE ENTRY

Vehicle entry into live process units shall be kept to a minimum.

Vehicles with an internal combustion engine entering a hazardous classified location or a permitted road shall receive a Vehicle Entry Permit or be included in a Permit to Work.

Permitted roadways are all roads that are designated as hazardous classified locations, such as Class 1, Division 2. Other roads may be identified as permitted roadways to help with traffic control.

Shift Trucks

Shift Truck Pass Vehicles that are used as a tool for part of a task, such as cranes or forklifts in hazardous classified areas or permitted roadways should be included in the Permit to Work for that task.

A Shift Truck Pass shall:

- Be granted at the discretion of the Issuing Authority, even if a truck is listed as tool on the permit. This means the Issuing Authority may deny entry of the truck
- Be completely filled out by the Issuing Authority
- Be valid only for the date listed on the pass
- Be displayed at all times. Shift Truck Passes have been designed to be hung from the rearview mirror
- Be returned to the Issuing Authority by the end of the shift
    - Once returned, the Issuing Authority should discard the pass.

A Shift Truck Pass is not needed if a 2-hour Vehicle Entry Permit is issued.

Vehicle Entry Permit

Before the Vehicle Entry Permit or Permit to Work is issued, a risk assessment shall be completed.

The risk assessment shall include job site hazards and controls, such as:

- Duration of vehicle on site
- The area where the vehicle is to be sited
- Locations of vents, drains, sewers, sample points, etc.
- All other relevant hazards in the area
- Any simultaneous operations (SIMOPs) that may conflict, such as hydrocarbon breaking containment work

The Vehicle Entry Permit shall be valid for a maximum of two hours.

The vehicle entry/exit path and location shall be specified on the Vehicle Entry Permit or discussed while issuing the Permit to Work.

For vehicles with a Vehicle Entry Permit, the permit shall be displayed in the vehicle at all times when on a permitted roadway or in a hazardous classified location.

If the Vehicle Entry Permit or Permit to Work for vehicles are to be revoked due to operational upsets or emergencies, any other affected areas that permission has been granted to issue permits must be notified. The Emergency Operations Center (EOC) can be called and requested to issue an "ALL CALL" on the radio and a Public Address Announcement that states that permits have been revoked for that certain area.

Gas Monitoring

Before the Vehicle Entry Permit or HWSP permit is issued, an Authorized Gas Tester (AGT) Level 1 or Level 2 shall test the area with an active gas monitor. The LEL must be zero for a permit to be issued.

Continuous gas monitoring shall be performed on permitted roadways or in hazardous classified locations once the vehicle reaches its set down point. It is encouraged to have an escort walk at a safe distance in front of internal combustion engine equipment and vehicles with a gas tester to ensure the atmosphere is safe to drive in. If the vehicle is parked and turned off, continuous monitoring must be conducted in the area before the vehicle is turned back on.

If the LEL exceeds zero, the AGT shall order the vehicle to be shut off.

Traveling

For vehicles passing through one area to get to another area, the Issuing Authority for the Vehicle Entry Permit or Permit to Work shall be the Issuing Authority at the destination point. The Issuing Authority shall receive permission from all Affected Issuing Authorities that the vehicle can pass through the identified areas via radio. The Affected Issuing Authorities shall test their areas and

verify that their portion of the route has been tested and results are 0% LEL and that SIMOPS have been identified and controls identified

MAINTENANCE OF EQUIPMENT

Any equipment defect or safety hazard to his/her equipment should be reported to the supervisor and will be discontinued until its safety has been assured. Repairs shall be made only by qualified personnel.

FIRST AID

- First aid supplies shall be easily accessible when required.
- First aid equipment supplies, and facilities must be kept clean, dry and ready for use, and be readily accessible at any time a worker works in the workplace.
- Workplace activities influence potential harmful consequences for staff, clients and others. Each worksite is likely to have different first aid requirements.
- **Joaquin Blas.** will determine the number of designated First Aid Officers, the type of First Aid kit required and the organization's approach to first aid response.
- All personnel are encouraged to disclose health information which may assist in prompt and appropriate first aid responses to foreseeable medical emergencies.
- In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first aid shall be available at the worksite to render first aid.

Working Alone

PURPOSE

The purpose of this document is to outline safety policy and procedures for Working Alone on behalf of **Pacific Northwest Towers**; hereafter referred to as "The Company."

RESPONSIBILITIES

Safety Officer

- Ensure that all personnel are trained in the awareness and avoidance of unsafe work practices while working alone

Personnel

- Follow all aspects of this safety policy

POLICY

Working alone in certain circumstances, situations, or environments can increase the risk to the health and safety of the worker. Special arrangements must be made to minimize this risk, especially after normal working hours, as these circumstances pose an additional risk to life and property. Where a worker is working alone, The Company will develop and implement written procedures to ensure, as far as is reasonably practicable, the health and safety of the worker from risks arising out of, or in connection with, the work assigned.

Working Alone applies to a worker who is the only worker of the employer at that workplace, or work site, in circumstances where assistance is not readily available to the worker in the event of injury, ill health or emergency.

The Company shall be responsible for ensuring a procedure for assessing working alone situations and site-specific working alone plans are developed, implemented, communicated and enforced.

Employing authorities shall review each worksite under their supervision to identify employees who work alone.

RISK ASSESSMENT

The Company will examine each worksite, prior to initial assignment, to determine potential hazards and ways to minimize them. In addition, a pre-start / kickoff meeting will occur between The Company management and the affected worker to review potential risks and hazards, and ways in which injury may be avoided.

The hazard assessment shall address hazards and identify control measures in order to minimize risk associated with working alone.

An effective form of worker communication shall be established so the worker may call for emergency assistance if needed.

COMMUNICATION

The Company will, for any worker working alone, provide an effective communication system consisting of:

- Radio communication,
- Landline or cellular telephone communication, or
- Some other effective means of electronic communication that includes regular contact by the employer or designate at intervals appropriate to the nature of the hazard associated with the worker's work.

An effective means of communication is established between the lone employee and designated check at all times.

If effective electronic communication is not practicable at the work site, The Company will ensure that:

- The employer or designate visits the worker, or
- The worker contacts the employer or designate at intervals appropriate to the nature of the hazard associated with the worker's work.

CHECK IN/OUT

Individuals must be monitored at regular intervals, or the individual contacts the employer at pre-determined intervals based on determinations made in the risk assessment.

The work-site supervisor, or an assigned member of management will be responsible for check-in with the lone employee at regular intervals. Backup forms of communication shall be implemented in the event primary correspondence is unavailable as well as documentation including employee status at the check in intervals.

EMERGENCY RESPONSE

Whenever a lone worker fails to perform check-in for two consecutive scheduled check-ins, a member of management will be responsible for contacting public safety officials to request a rescue search.

TRAINING

Working alone in certain circumstances, situations, or environments can increase the risk to the health and safety of the worker. The Company shall ensure employees are properly trained to competently handle their tasks. New hire training will be provided to employees and refresher training shall be provided annually after.