PUGET CONSTRUCTION SERVICES, INC.

EMPLOYEE SAFETY MANUAL

1609 Central Avenue So, Unit #2
Kent, WA 98032
253.856.2572

1st Edition

Welcome to the Puget Construction Services

These Safety and Health Policies have been established to promote compliance with all State and Federal policies and procedures regarding site safety, health, environmental, and security standards.

Please read these procedures carefully and make sure that you fully understand all sections. More importantly, use them to ensure the safety and well-being of both you and fellow members of your team.

Safety is an essential element of work performance at PCS. Each Employee is responsible for carrying out their responsibilities under these procedures. As an Employee, you are expected to maintain the high standards set forth in this Manual.

Thank you for your cooperation!

QUESTIONS?

Contact

Human Resources or your immediate Supervisor

PURPOSE

The purpose of this Safety and Health Manual is to outline a plan for preventing job-related accidents. The manual sets forth a standard set of elements that are required for an effective safety program. This manual is not all-inclusive. Other elements may be added as they expressly apply. There may be other essential elements that some job sites, by nature of the specific type of work being performed, will require in addition to the specifics of this safety program.

This manual sets forth basic responsibilities, guidelines, rules, and regulations for all personnel employed by PCS. The intent is to enhance and supplement any Safety and Health Standards that are required by law, and are applicable to any PCS construction project. This manual does not cover the full spectrum of published safety and health standards that are mandated by law. Consequently, Contractors shall not assume that they are responsible only for those standards, which are referenced in this manual, or that those standards are current and quoted as published. It is each employee's responsibility to ensure that they are in compliance with all safety directives required by law, and the directives included in your PCS Safety Manual.

In the event of a conflict between the provisions of this manual and applicable local, State or Federal safety and health laws, regulations and/or standards, or contract documents, the more stringent provisions shall apply. This manual is subject to revisions and updates as state and federal laws change.

GOALS & OBJECTIVES

The goal of this manual is to establish and maintain a safe working environment for our employees, sub-contractors, any proximity general public. It is the responsibility of each individual to assist in accomplishing the following objectives:

- To strive toward the goal of **Zero Accidents/Injuries** by carefully and systematically planning, implementing, and enforcing proper safety procedures to avoid bodily injury, property damage and loss of productivity.

- To create a **Safety Culture** by increasing the safety and environmental awareness of employees through the establishment and maintenance of an Employee Safety Training Program, with assistance from Management and Organized Labor (if applicable). This shall include the orientation of all new employees, attending regular safety meetings, following through with any required pre-task planning and participation in ongoing safety training.

- To minimize hazards/disruptions to the traveling public by controlling access to construction areas, following established safety procedures to avoid impacts to operational systems and equipment, as well as securing work areas adjacent to those spaces that may be frequented by the public.

- To establish and maintain a system that promptly identifies and corrects unsafe practices or conditions.

- To establish emergency procedures and communications that will minimize fire, police or ambulance response time in the event of an occurrence.

All Employees must strive to achieve compliance with U.S. Labor Department Occupational Safety and Health Administration (OSHA) requirements, including Washington Industrial Safety & Health Act (WISHA), Washington Administrative Code (WAC), local, and site specific safety requirements.

> *"The safety of everyone employed at PCS depends directly upon individual effort and commitment to the goals and objectives of this Safety Program. We must, all of us, do our part, and encourage and demand others to do theirs."*
>
> ***Kris Willard, President***

MISSION STATEMENT

Puget Construction Services (PCS) is dedicated to the principle that a safe project is a good project. PCS is committed to the safety of its employees, the surrounding community, and the environment.

While PCS has the responsibility for conducting business in a manner that strives to prevent accidents, all employees and sub-contractors must share that responsibility. All employees are expected to work safely and contribute to the safety of others.

Sub-contractors must make every reasonable effort to support PCS's efforts to provide a safe and healthy work environment, free of recognized hazards.

The effectiveness of this safety program depends on the combined efforts of all PCS employees and associates, to achieve this goal the PCS Safety Committee has established. In support of this, PCS will meet monthly to monitor projects and provide input on Safety and Health issues.

Table of Contents

Introduction

Section I – Project Information

Section II – Safety & Health Rules

Section III – Permit Required Procedures

1.1 EMERGENCY PROCEDURES

FIRE: Call 911 – from a standard land line

NOTE: Using a Cell Phone to call 911 may result in delays!

In case of fire, injury or emergency at any building or location on a project, contact the appropriate emergency services at the numbers listed below and provide all details required. Remember to "Stay on the line!" to assist with any information required. In the event of a fire, evacuate the area by following your emergency evacuation plan. In the event of injury to personnel, provide assistance as applicable. In either situation, direct incoming emergency response personnel to the location quickly and assist as required. Either you or your supervisor is responsible for reporting pertinent information to arriving emergency response personnel.

On-site loss of property or materials should be reported to your on-site supervisor, or PCS Management, or to any on-site Police. Thefts will be prosecuted to the fullest intent of the law.

Police / Fire / Emergency .....911 (from a Land Line if possible)

PCS Safety Department..... (253) 856-2572

Manager Construction ..... (206) 793-4923

Field Construction Safety Manager..... (206) 793-4923

NOTE: These emergency numbers shall be posted at the job site.

CHEMICAL OR FUEL SPILL

The following should be notified in the event of a chemical or fuel spill:

On Land:

- Immediate Supervisor
- Fire Department…dial 911 (if necessary)

EMERGENCY EVACUATION PLAN

Each PCS Job-Site Supervisor shall have in place written Site Specific Emergency Procedures and site evacuation plans. These plans shall include how PCS personnel will deal with severe weather conditions, natural disasters such as earthquakes, general emergencies or a higher security alert status, and/or construction related emergencies. The plan shall include primary and secondary locations/assembly points where affected personnel will meet following such conditions, how personnel will be accounted for, and this information shall be posted in a conspicuous location, and all on-site personnel will be notified of these assembly points at their initial safety orientation.

All inquires from the media regarding any incident occurring on the site shall be referred to PCS Supervisor or PCS Management Representative, if on-site.

All Employees need to be committed to PCS's goal of Zero Accidents/Injuries. To achieve this, proper planning, scheduling, and execution for the safety and health of all personnel must receive primary consideration in all work related activities.

A. The Employee must assume full and sole responsibility for their onsite safety while performing work under this program.

B. PCS shall submit a copy of their Site-Specific Safety & Health Program, as specified in the company Safety Management Procedures for review by all Employees. PCS retains responsibility for the submittal and review to their sub-tier contractors to assure uniform compliance.

C. PCS shall maintain responsibility to insure that all sub-tier contractors working under their direction comply with all applicable laws, regulations, ordinances, conditions of the contract, or orders of any public authority having jurisdiction relating to the safety of persons or property.

D. PCS will keep a competent resident Project Manager or Superintendent at the site of the work continuously during its progress, and all work shall be performed under the continuous supervision of competent and skilled personnel experienced in the task being performed.

E. PCS shall check for and correct any unsafe practices and conditions that exist in the execution of their Employee's or sub-tier contractor's work responsibilities, and shall maintain records of any unsafe conditions created by others.

F. Prior to a new employee starting work, they will receive a site-specific safety orientation administered by a PCS authorized representative. Additionally, they will attend a new hire orientation that reviews the PCS's safety rules and requirements.

G. PCS will employ at the site (or have on call), a qualified Site Safety Representative whose duties include the protection of persons and property, and the administration of the company's safety program.

H. PCS will, at its discretion, conduct, regular safety meetings with their personnel. Attendance and subjects discussed at these meetings will be recorded and a copy kept on file.

I. PCS will, at its discretion, hold regular all-hands safety meeting with its employees, and/ or subcontractors (if available and pertinent). An agenda will be prepared and distributed for any such meeting. The meeting will include a safety update, and pertinent safety information for upcoming work. PCS at all times encourages input and involvement from all parties in attendance.

J. A PCS representative will perform daily inspections of each project site and correct any substandard safety conditions and practices. These inspections and results will be documented.

K. PCS will at all times enforce a policy of strict adherence and good order among all workers on any project; and PCS will adopt procedures with provisions for disciplinary action, or if deemed necessary, effect the discharge of employees who carelessly or callously disregard these rules or other applicable safety and health regulations, where they might place others in danger.

L. Alcohol, drugs, and weapons are not allowed onsite under any circumstances. Failure to comply will be cause for immediate removal of the employee.

M. All PCS employees working on any company project must follow the company's Substance Abuse Prevention Program (reference the PCS Employees Handbook).

1.2 PCS' SAFETY RESPONSIBILITIES (as they apply to their Customers)

A. All PCS personnel are to be properly trained and instructed in all jobs which require specific training and/or competency to meet all applicable OSHA, WISHA, WAC regulations and standards, Local, State, and Federal laws, and the requirements herein. Where regulations require the designation of "Competent Person", PCS shall submit the names of those individuals, their qualifications and/or certifications, and the discipline they are deemed competent in to their customer. These disciplines include but are not limited to welding, electrical, scaffolding, roofing, cranes, excavations, lift slab construction, steel erection, and underground construction.

B. Prior to the performance of any work, all PCS employees shall be instructed as to the hazards, rules/requirements that apply to the work they are to perform.

C. Supervisory personnel shall require all employees working under their supervision to comply with all applicable safety rules.

D. Personal Protective Equipment (PPE) shall be provided to employees by PCS, used where required, and maintained in proper condition.

E. PCS does not and will not tolerate dangerous practical jokes or horseplay, physical confrontation of any kind, where unnecessary risk is or may be taken by employees.

F. PCS shall train employees in the proper storage and handling of hazardous materials (i.e., flammable, combustible, toxic) and hazardous wastes.

G. PCS employees and supervisors shall immediately report unsafe acts or conditions observed that are not under their control to the proper PCS management.

H. PCS shall assure that all vehicles and equipment working on the Customer's site will be in good repair and are operational in a safe condition.

I. PCS shall notify on-site personnel immediately in the event of a site inspection by Labor & Industry (L&I) to ensure a PCS's representation can attend such meetings or inspections. Copies of any documentation, citations or correspondence received from L&I in regard to any such visit shall be recorded and filed with the company with all other documents referencing the specified job site.

J. PCS shall comply with all Confined Space Entry Requirements contained in any and all company/employee manuals.

K. PCS shall document all accidents or injuries requiring more than first aid treatment, and maintain copies of these reports for further inspection as required by State L&I regulations.

L. Within 48-hours of a Recordable or Lost Work Day Case Injury, incident involving a 3rd party, or property damage, PCS shall meet with all interested parties. The meeting shall discuss the status of any injured persons, the root cause of the incident, corrective action implemented, ascertain a Job Hazard Analysis, and implement any retraining of all parties involved.

M. PCS shall maintain a written Job Hazard Analysis (JHA) for work to be performed, outlining the equipment to be used, the identified hazards that may exist or be created and what procedures or safety equipment will be used to eliminate or reduce those hazards. Completed JHA's are to be reviewed with the workforce and shall contain their signatures as an acknowledgement. PCS accepts its responsibility to ensure all responsible parties are completing written JHA's. A Sample form is provided on page 1.2.11 of this section.

N. PCS shall have on file the names of all employees trained in CPR and First Aid.

O. PCS shall provide appropriate first aid supplies for their employees and those trained personnel who may have to administer first aid as required.

1.3 EMPLOYEE SAFETY COMMITTEES

A. Scope:

At this time it has been determined by PCS management that the formation of a Safety Committee would not be in either the company's or the employee's best interest. The scope of PCS's operation would be best served by utilizing individual safety meetings where applicable.

B. Purpose for Conducting Safety Meetings:

The dissemination of safety related materials, along with any updated bulletins regarding new or revised standards will be supplied by PCS management. Should a specific meeting be required to further explain or discuss any safety concerns, violations or addendum's, PCS management will notify those employees effected.

C: Concerns:

1: Reviews of any safety and/or health hazards, as listed on inspections.

2: Evaluation of accident investigations to determine and/or discuss if the cause(s) are the result of an unsafe act or condition, further determining if all causes were properly identified and abated.

2.1 SAFETY ORIENTATION & TRAINING

A. Scope:

This section defines the minimum safety training requirements for all PCS personnel working on any, and all, Construction Projects.

B. Purpose:

To inform PCS employees of safety & health rules and regulations, specifically as they may apply to a particular job site. All PCS employees are required to be familiar with the guidelines noted below.

C. Safety Orientation:

All PCS personnel working on any company related construction project shall receive a site safety orientation prior to commencing work. Safety handbooks, if applicable. will be distributed. Employees will be apprised of site-specific safety procedures, and as always, PCS will require all employee to adhere to all rules and guidelines as we strive for a Zero Accident/Injury status.

D. Safety Training:

PCS will provide basic safety training as well as any refresher training to employees as deemed necessary by PCS management and in reference to OSHA and WAC standards.

Note: On pages 2.1.3 – 2.1.5 are a listing of safety training required by OSHA for the construction industry. PCS will, in accordance with these guidelines, maintain detailed records of training for their employees and notify such employees should additional training be required.

2.2 SAFETY RULES

PCS is responsible for compliance with site safety policies/procedures and are directly responsible for the safety of its employees. As such all employees are required to familiarize themselves with these requirements. General responsibilities include:

A. PCS will permit only qualified, trained personnel to operate aerial lifts, forklift, or motorized equipment and machinery.

B. Ladders will be properly constructed and kept in good repair. They shall be of the proper length and type for each respective task, and secured to prevent displacement.

C. All scaffolding will be constructed in accordance with 29 CFR 1926 OSHA/Subpart L, and WAC 296-874.

D. Compressed gas cylinders shall be stored upright, secured, and separated, with protective caps in place at all times when not in use. Gauges shall be removed prior to transportation of cylinders. (WAC 296-150-400)

E. All guards on equipment for the protection of personnel shall be kept in place during usage, and maintained in good mechanical order.

F. No modifications or additions which affect the capacity or safe operation of any equipment shall be made by any PCS employee. Any suggestions for same must be brought to the attention of PCS management. If deemed valid PCS would first secure the manufacturer's or a licensed professional engineer's written approval, prior implementing.

G. PCS on-site management is responsible for securing proper lighting and illumination of work areas. Any problems or concerns regarding such are to brought to the attention of site management.

H. PCS employees shall avoid working, driving, or walking under suspended loads, e.g. ladders and forklifts.

I. All excavations shall be in accordance with the requirements found in 29 CFR 1926 OSHA Subpart P and WAC 296-155-650. Adequate access and egress must be provided for excavations that are 4 feet or more in depth.

J. Safety, Danger, Warning, and Caution tags or signs shall be posted, observed and complied with. Tags and signs shall not be removed unless authorized by site management.

K. PCS employees shall maintain good general housekeeping in their work area to minimize all fire hazards, and trip/slip and fall hazards.

L. PCS employees shall ensure that proper tools for each task are used and maintained in safe operating condition.

M. PCS may be required to provide Material Safety Data Sheets (MSDS) on any hazardous substance brought onto a specific job site. MSDS's shall be the most current edition, but no more than 3 years old.

N. Utilities must be determined and in place prior to the start of any work.

O. Traffic control and the use of flaggers must comply with WAC 296-155-305, Part E, Signaling and Flaggers. Certified flaggers shall be utilized when construction operations impact traveled roadways, ramp and baggage operations. PCS management will maintain records of flagger certifications.

P. Firearms are strictly forbidden on any company project.

Q. For job site safety, the use of AM/FM radios, CD or tape players is prohibited along with the use of personal headsets.

R. Makeshift work platforms such as 5-gallon pails or crates shall not be utilized.

S. Glass bottles are prohibited on the project.

2.3 PERSONAL PROTECTIVE EQUIPMENT

A. Scope:

This section defines the minimum requirements for the selection, use, and maintenance of Personal Protective Equipment (PPE) on all PCS construction projects.

B. Purpose:

To reduce or eliminate the potential of injury to Contractor employees and visitors performing work on the PCS construction projects. All PCS employees working in areas where Personal Protection Equipment is essential are required to be familiar with the guidelines set below.

C. Reference:

Refer to: OSHA - 29 CFR 1926 Subpart E Personal Protective and Life Saving Equipment,

Washington State: WAC 296-155-17615, WAC 296-800-160 Fall Protection, WAC 296-24-980,

Section 2.8 Fall Protection in this manual.

D. General:

1. 100% Hard Hat Policy:

   All employees are required to wear approved, non-metallic hard hats while on the work site at all times. This includes subcontractors, vendors, suppliers, and visitors. Hard hats are designed, tested, and certified to be worn in only one position – with the liner securely in place and the bill turned forward. The only time employees are allowed to "reverse" their hard hats are when their work creates an absolute need to turn the hat backwards. For example, when welding hoods or face shields are designed to attach to the backside, when connectors are receiving a hoisted load, or when surveyors are looking through a transit or level. To provide full protection in those situations the suspensions shall be reversed. When those tasks are completed, the hard hats are to be restored to their correct positions. All protective headgear shall meet the requirements of ANSI Z89.1-1969. The use of "Cowboy" type hardhats is prohibited.

2. Face Protection Policy and 100% Safety Glasses/Goggles Policy:

   All employees are required to wear safety glasses or goggles at all times while on the work site. Full-face protection, as provided by a face shield shall be required at all times when potential injury to the face itself exists. Work activities that require use of full face shields include, but are not limited to, grinding, "housekeeping blow downs" using compressed air, chipping concrete, cutting metal decking, chain saws, handling toxic or corrosive chemicals or liquids, using power-actuated tools, certain instances of drilling, and using jackhammers or air hammers. During steel

erection activities, this includes reaming, drilling, welding and cutting. The use of a face shield does not preclude the requirement to utilize eye protection under it.

Note: Eye and face protection equipment shall meet the requirements specified in American National Standards Institute, Z87.1-2003.

3. Footwear:

   Footwear made of leather or other equally firm material in the form of work shoes or boots shall be worn by all individuals while on the project site. Protective footwear shall comply with ANSI (American National Standard) Z41-1991. Traditional tennis shoes, shoes with canvas tops, or thin or soft sole athletic shoes, open toed sandals, slippers, dress shoes or other similar type shoes shall not be worn. Employees engaged in the use of soil compacting equipment shall utilize metatarsal protection.

   Note: Alternate footwear appropriate for a specific task may be worn during performance of that task; i.e.: rubber boots during concrete placement or wet muddy conditions.

4. Hearing protection:

   Hearing protection shall be worn when working in areas posted as hazardous noise areas (airfield and runways), or when working around or using equipment that presents high noise hazards as identified through the Contractor's Hearing Conservation Program.

5. Respiratory protection:

   Respiratory protection shall be worn when performing tasks that expose personnel to dust, gases, mists, vapors, fumes, or oxygen deficiencies. Examples of those operations would be drilling, grinding and chipping concrete, welding, painting, sandblasting, or other operations where dust hazards exist. Dust masks or cartage type respirators do not protect employees in oxygen deficient atmospheres.

   Note: PCS has a Respiratory Protection Program equal to or exceeding WAC 296-842.

   Note: Dust masks or cartage type respirators do not protect employees in oxygen deficient atmospheres.

6. Fall Protection:

   100% fall protection shall be utilized when working from unprotected walking/working surfaces four (4) feet or greater in height. For other than walking/working surfaces 100% fall protection shall be utilized for work six (6) feet or greater in height.

7. Night Visibility:

   All employees working on a job site, exposed to vehicular traffic, heavy equipment, or involved in low light or night operations, shall wear highly visible or reflective garments as prescribed by ANSI.

8. Dangerous Machinery Protection:

   All PCS personnel engaged in the cutting, welding, or scarfing of steel shall utilize a welding hood or tight fitting goggles combined with a face shield. The protection shall be of the proper shade as required by ANSI. Personnel utilizing chain saws shall wear eye, face, hearing, and leg protection.

E. Appropriate Project Attire…(the following minimum dress requirements apply to all employees, Subcontractors, Vendors, and Visitors.)

1. Tank tops, net shirts, cut-off shirts, or sleeveless shirts may not be worn at customer job sites. As a minimum, employees are required to wear a shirt top that is comparable to a T-shirt. Shirts must have a sleeve that covers the ball of the shoulder in the same manner as a T-shirt with a sleeve at least 4 inches long.

2. Pants must be full-length. Shorts, skirts and other such apparel are not permitted on job sites.

   Clothing must not hang loose to the point where they can be caught in parts of moving machinery.

3. Employees who perform welding and cutting, operate rotating machinery, or are exposed to chemicals, fire, or other such hazards, must contain their beards and hair to a point where there is no danger of their hair catching fire, dipping into chemicals, or being caught in rotating machinery.

4. Jewelry is discouraged from being worn while working, e.g. crush finger parts are resilient, a crushed ring is not.

F. 100% Glove Policy:

To reduce the possibility of hand injuries, all employees working on job sites or in the shop, shall utilize gloves appropriate to the tasks being performed. If not sure what type of glove wear is appropriate, consult with the "Glove Guide" below, or consult with your immediate supervisor. Should an employee feel there is a greater risk of injury to be imposed by the use of gloves, or the glove may require modification to perform a given task, the employee must first get approval from their immediate supervisor. Final selection of the best hand protection is the responsibility of the PCS.

Note: Any alteration of this glove policy without prior approval may result in disciplinary action. Supervisors are to record any such alterations, in writing, and turn such record in to management daily

Glove Guide

Final selection of the best hand protection is the responsibility of each contractor

Tasks	Cloth Leather	Cloth Rubber	Kevlar Full Finger	Pigskin	Latex Yellow	Anti-Vibration	Cotton String net	Blue Nitrice (Med)	Cowhide Welders
Block Setting (mason)		■							
Cutting Insulation			■						
Drilling				■					
Drywall Hanging		■	■						
Equipment/Crane Operation				■					
Flagman	■								
Form Setter	■	■							
Glazing		■	■						
Hammering	■			■					
Hand Digging	■	■							
Hardware Installation							■		
Jack Hammering				■		■			
Membrane Installation								■	
Mixing Concrete	■	■							
Mortar Mixing		■							
Oiling				■				■	
Title									
Painting					■			■	
Pile Driving	■			■					
Pipe Treading/Fitting		■	■						

Glove Guide *(continued)*

Final selection of the best hand protection is the responsibility of each contractor

Tasks	Cloth Leather	Cloth Rubber	Kevlar Full Finger	Pigskin	Latex Yellow	Anti-Vibration	Cotton String net	Blue Nitrice (Med)	Cowhide Welders
Placing Mesh		■							
Placing Rebar		■							
Planing				■					
Post Driving	■	■							
Powder Actuated Gun		■		■					
Saw Cutting		■	■	■					
Scaffold Erection	■								
Screws/Fasteners		■							
Sealing/Caulking					■			■	
Setting Tile		■						■	
Sheet Metal			■						
Shoveling	■								
Spreading	■								
Stapling			■						
Stone Setting		■							
Sweeping	■	■							
Surveying							■		
Troweling								■	
Welding									■
Wiring		■	■		■				

2.4 HAZARD COMMUNICATION

A. Scope:

This section defines the minimum safety requirements for PCS employees who use or store hazardous materials.

B. Purpose:

The purpose of the Hazard Communication Program is to inform PCS employees of workplace chemical hazards, including the labeling system and use of Material Safety Data Sheets (MSDS).

C. References:

Refer to: OSHA Standards: 29 CFR Part 1926.59,

Washington State Standards: WAC 296-155-180 & WAC 800-170

D. General:

1. PCS has/does:

    a. Developed a site-specific hazard communications program.

    b. Maintain a master list of chemicals that are approved for use on any project.

    c. Procured and maintains MSDS for all applicable chemicals, materials, or substances available for use at any work site.

    d. Reviews for MSDS standards, including significant health and safety information.

    e. Make MSDS's available for all employees to review during all work shifts.

    f. Provide hazard communication training to employees at time of hire, and conducts repeat training sessions when new chemicals are introduced on any given project.

    g. Inform site personnel of possible hazardous exposures of chemicals in use.

    h. Provide notification to adjacent workers and businesses near a job site prior to application of certain products.

    i. Take all measures necessary to prevent any materials from migrating from the work site into areas occupied by the public or other businesses. This includes, but is not limited to, dust, fumes, liquids, mists, and vapors.

j. Provide Personal Protective Equipment (PPE) appropriate for all hazardous conditions and offers training for employees in the proper use of PPE.

k. Provide training for proper labeling of containers, including secondary containers.

l. Provide training for proper handling, storing, and disposing of chemicals.

Note: In the event of a chemical or fuel spill, unless in an emergency or life threatening situation, first notify your nearest supervisor. Otherwise call 911 and ask for Fire emergency personnel and explain clearly the purpose and specifics of you call.

2. Program Elements:

a. PCS maintains a Chemical Inventory List under the Hazard Communications Standards for, any substances that have Permissible Exposure Limits (PEL) under

i. The Washington Industrial Safety and Health Act (WISHA) in Chapter 296-62-075.

ii. Any substances that the American Conference of Governmental Industrial Hygienists (ACGIH) included in the latest edition of its annual threshold limit value (TLV) list.

iii. Any substance that the National Toxicology Program (NTP) or International Agency for Research on Cancer (IARC) found to be suspected or confirmed carcinogens, or that WISHA regulates as carcinogenic in Chapter 296-62-WAC Part F & G.

Note: Chart below:

The following products are usually hazardous and should be on chemical inventory lists.

Acids	Flammables	Pesticides
Adhesives	Fuels	Process chemicals
Aerosols	Fungicides	Resins
Battery fluids	Herbicides	Sealers
Catalysts	Industrial oils	Shellacs
Caustics	Insecticides	Solvents
Cleaning agents	Janitorial supplies	Surfactants
Degreasing agents	Lacquers	Varnishes
Detergents	Office copier chemicals	Water treatments
Epoxies	Paints	Wood preservatives

b. PCS maintains a Container Labeling list with samples. Note:

i. All containers of chemicals must retain the original label and information provided from the manufacturer or distributor to clearly identity each type of hazardous chemical. Appropriate hazard warnings (CAUTION, WARNING, or DANGER written on the label to indicate a chemical is hazardous, along with all other pertinent information.

ii. Employees must not make any alterations to chemical storage without prior consent of a PCS Supervisor.

iii. All secondary or other containers that chemicals are transferred to must be labeled with at least the product name and any associated hazards such as flammable, combustible, toxic, corrosive, and any special precautions such as “Do not store near heat” or “Do not mix with water”.

iv. Labels shown in part 3 of this section are examples of appropriate secondary container labels for use at PCS job site or shop conditions. This type of label must be affixed when material is transferred from its original container to a secondary container such as a paint can, spray bottle, oil can, etc. They must include the Name of the Chemical, as well as Health, Flammability, and Reactivity hazard numbers (these are note on the charts below).

“Health” Hazard Rating Definitions

0 Minimal	No significant risk to health.
1 Slight	Irritation or minor reversible injury possible.
2 Moderate	Temporary or minor injury may occur.
3 Serious	Major injury likely unless prompt action is taken and medical treatment is given.
4 Severe	Life threatening, major or permanent damage may result from single or repeated exposures.

"Flammability" Hazard Rating Definitions

0 Minimal	Material which are normally stable and will not burn unless heated.
1 Slight	Material that must be preheated before ignition will occur. Flammable liquids in this category will have flash points (the lowest temperature at which ignition will occur) at or above 200 degree F (NFPA Class IIIB).
2 Moderate	Material that must be moderately heated before ignition will occur, including flammable liquids with flash points as or above 100 degrees F and below 200 degrees F. (NFPA Class II & Class IIIA).
3 Serious	Material capable of ignition under almost all normal temperature conditions, including flammable liquids with flash points between 73 degrees F as well as liquids with flash points between 73 degree F and 100 degrees F (NFPA Classes IB & IC).
4 Severe	Very flammable gases or very volatile flammable liquids with flash points below 73 degrees F and boiling points below 100 degree F (NFPA Class IA).

"Reactivity" Hazard Rating Definition

0 Minimal	Materials that is normally stable, even under fire conditions, and which will not react with water.
1 Slight	Materials that are normally stable, but can become unstable at high temperature and pressures. These materials may react with water, but will not release energy violently.
2 Moderate	Materials that are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may react violently with water.
3 Serious	Materials that are capable of detonation or explosive reaction, but require a strong ignition source, or must be heated under confinement before ignition, or materials that react explosively with water.
4 Severe	These materials are readily capable of detonation or explosive decomposition at normal temperature and pressures.

3. Label Examples:

4. Material Safety Data Sheets (MSDS) - Basic Information:

MSDS's provide pertinent information about hazardous substances, such as chemical composition, effects of exposure (via handling, storing, using or transporting), protective measures, and emergency procedures. MSDS' are provided, free of charge by any manufacturer or distributor of any hazardous substance. PCS maintains an up-to-date supply of MSDS documents and allows free access, during any scheduled work hours, for anyone potentially exposed to any hazardous substance at any job work place.

5. Hazardous Non-Routine Tasks:

Employees may be periodically required to perform hazardous non-routine tasks. Some examples of non-routine tasks include confined space entry, line breaking, tank cleaning, etc. Prior to starting work, PCS will assure that each involved employee is given information by the concerning any hazardous chemicals they may encounter during such activities. The information will include specific chemical hazards; personal protective equipment; other safety measure the employee can use to reduce hazards, including ventilation and respirator use.

6. Education and Training:

Prior to starting work and introducing a new chemical into any area of works, PCS will provide training where the potential for exposure to hazardous substances exists. The training shall include:

a. Physical and health risks of the hazardous chemical.

b. Symptoms of overexposure.

c. How to determine the presence or release of hazardous chemicals in the work area, and awareness of substances being used by others.

d. How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, personal protective equipment, and emergency response.

e. Procedures to follow if employees are overexposed to hazardous chemicals.

f. How to read labels and MSDS's to obtain hazard information.

g. How to label secondary containers.

h. The importance of returning unused substances to original containers to limit the number of containers of hazardous chemicals.

i. Proper methods for disposal of hazardous chemicals.

j. Location of MSDS.

k. Requirements of the WISHA Hazard Communication Standards.

7. Chemical Substitution: PCS, with the assistance of an Industrial Hygienist and/or the Engineer, for a continued interest in employee safety, may opt to substitute a less hazardous product for any originally proposed for use for a given project.

Note: Employees must contact their respective job-site supervisors regarding any lack of clarity in reference to any of the above specifics prior to entering their assigned job-site.

2.5 FIRE PROTECTION

A. Scope:

This section defines the minimum requirements for fire prevention and protection on PCS projects and job sites. All PCS employees are required to be familiar with the Fire Protection guidelines set below.

B. Purpose:

To minimize the possibility of personal injury and property damage.

C. Reference:

Refer to: OSHA Standards: 29 CFR Subpart F & Subpart J,

Washington State Standards: WAC 296-155 Part D & H, NFPA,

Sections 2.6-Cutting & Welding, Sections 2.7-Flammable & Combustible Liquids of this manual.

D. Definitions:

Flame Resistant – Means so resistant to fire that, for a specified time and under specified conditions of standard heat intensity, it will not fail structurally and will not permit the side away from the fire to become hotter than a specific temperature.

E. General:

PCS has provided a fire protection and prevention program to be followed throughout all phases of operations. Specific fire protection plans will be prepared for each project and will include:

1. Provisions for adequate exits via stairs or ladders, etc., in case of an emergency.
2. Specific locations for fire extinguishers in accordance with WAC requirements.
3. Provisions for inspection and replacement of fire extinguishers located in the work area.
4. Proper storage of flammable and combustibles.
5. Maintained vehicle access.
6. Use of noncombustible panels, paint, flame resistant tarpaulins or approved material of equivalent fire retardant characteristics for the construction of temporary barricades.

Note: Employees must contact their respective job-site supervisors regarding the above specifics prior to entering their assigned job-site.

F. Fire Extinguishers

PCS will provide for the following and all respective PCS employees shall be trained annually in their use"

1. All fuel-powered equipment shall be provided with at least one serviceable 5-pound ABC- rated fire extinguisher.

2. At least one serviceable 10-pound ABC-rated fire extinguisher shall be readily accessible to all welding or similar operations.

3. All job site offices shall be equipped with at least one serviceable 10-pound ABC-rated fire extinguisher.

4. A serviceable fire extinguisher, rated not less than 2A, shall be provided for each 3000 square feet of the building area, or major fraction thereof.

5. At least one portable fire extinguisher having a rating of not less than 2A:10B shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

6. At least one portable fire extinguisher having a rating of not less than 20B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

G. Fire Alarm System

1. Fire suppression systems, fire alarm systems, and water systems shall not be made inoperable without providing 72-hour notice to PCS management and/or respective job-site employees. Service disruptions will follow in accordance with the company interim plan. Alternate alarm methods. e.g. sirens or air horns must be available.

2. Priority should be given to activation and operation of building standpipe systems.

3. Nothing shall be secured to any part of the building's fire suppression system

2.6 CUTTING & WELDING

A. Scope:

This section defines minimum safety requirements to be followed by PCS employees when, welding, cutting, and storing compressed gas cylinders on Plant locations or on job-site projects. All PCS employees involved with Cutting and Welding work are required to be familiar with the guidelines set below.

B. Purpose:

To eliminate the potential for fire, explosion, injury, impacts to employees, the general public, the facility (as it may pertain to property damage). Flammable and Combustible Liquids

C. Reference:

Refer to: OSHA - Letter of Interpretation dated 05/08/2006 - General industry and construction standards regarding "in use" or "ready to use" and "storage" of compressed gas and oxygen cylinders for welding; §1926.350(a)(10),

Washington State: WAC 296-24-68203, WAC 296-155 Parts C, D, & H, NFPA,

Sections 2.7 Flammable & Combustible Liquids and 3.2 Hot Work of this manual.

D. Definitions:

1. ***Hot Work*** – The use of open flame or spark producing equipment, gas or arc cutting, welding, brazing, and cad welding.

2. ***Cylinder Storage*** - when it is reasonably anticipated that gas will not be drawn from the cylinder within 24 hours (overnight hours included).

3. ***Cylinder In-Use*** – Anytime cylinder is not in storage

E. General:

1. Equipment such as leads, torches, regulators, gauges and hoses shall be inspected before each use and be in good operating condition. Equipment that is defective shall be tagged and removed from service.

2. Torches shall be lit by means of a friction device and not by match or lighter.

3. “Hot Work” shall not be performed within 35 ft. of combustible material.

4. Identify on Job Hazard Analysis methods to protect skiff fuel tanks from ignition source

5. Regulators shall be equipped with “flashback” protection devices, as well as back flow protection devices at both the torch and regulator hose attachment ends.

6. Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

7. A suitable cylinder cart or truck shall be used to transport and store cylinders while in use.

8. A wrench or hand-turn shut-off valve shall be present at all times when compressed gas cylinders are in use.

9. Individuals performing cutting and welding, as well as any individual assisting that individual shall wear the proper eye and face protection. This shall consist of tight fitting goggles and/or face shield with the proper shaded lenses.

10. The proper protective clothing shall be employed.

11. At least one 10-pound ABC rated fire extinguisher shall be readily available to all welding and cutting operations.

12. The Contractor shall provide noise-suppressed generators as required to perform the specified welding work.

13. All fuel-operated generators (gas or diesel) shall be located outside the building but not located near fresh air intakes.

14. Barriers or screens shall be used to protect other employees or the traveling public while work is being performed.

15. In order to mitigate welding smoke, the Contractor shall furnish and use self-contained mobile, high-efficiency filtration units such as the Plymo Vent MK 800 whenever and wherever welding operations are taking place.

16. Liquid Propane (LP) is Carbon Monoxide (CO) producing. When CO producing equipment is utilized “indoors”, the Contractor shall have a plan in place to monitor and mitigate the hazard to workers

F. Storage Requirements:

1. Cylinders shall be kept clear of heat sources.

2. Cylinders shall be stored in well-ventilated and protected locations, at least 20 feet from highly combustible materials. Cylinders should be segregated into pre-assigned places, away from elevators, stairs, or gangways.

3. Cylinders shall not be kept in unventilated enclosures such as lockers, gang boxes, or inside conex boxes.

4. Cylinders shall be separated by a minimum of 20 feet or a one (1) hour rated firewall, 5 feet in height.

5. Empty cylinders shall have their valves closed, capped, and identified as “empty”.

6. Storage of empty cylinders shall be separated from full-charged cylinders.

7. Valve protection caps, where the cylinder is designed to accept a cap, shall always be in place and hand tight, except when cylinders are in use.

8. Compressed gas cylinders shall be secured in an upright position at all times, including when hoisted or transported.

9. A fire extinguisher of properly rated capacity and type shall be placed no closer than 25 feet, but no farther than 75 feet from compressed gas storage areas.

10. Retention chains will be provided on storage racks and carts to allow compressed gas cylinders to be secured against falling.

11. Storage racks shall be posted with sign labels to clearly identify the content of gas in cylinders.

12. Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than thirteen thousand cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), connected in service or ready for service, or more than twenty-five thousand cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), including unconnected reserves on hand at the site, it shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965

2.7 FLAMMABLE & COMBUSTIBLE LIQUIDS

A. Scope:

This section defines the minimum safety requirements for the use and storage of Flammable and Combustible Liquids on the PCS job-site projects.

B. Purpose:

To prevent injury to personnel or the general public due to fire or smoke damage in the facility. All PCS employees working around Flammable and Combustible Liquids are required to be familiar with the guidelines set below.

C. Reference:

Refer to: OSHA - 29 CFR Subpart F & J,

Washington State: WAC 296-155 Part D & H, NFPA,

Section 2.5 Fire Protection of this manual.

D. Definitions:

1. ***Approved*** - For the purpose of this section, means equipment that has been listed or approved by a nationally recognized testing laboratory such as Factory Mutual Engineering or the Underwriters Laboratory.

2. ***Portable Tank*** – A closed container having liquid capacity of more than 60 gallons, and not intended for fixed installation.

3. ***Safety Can*** – An approved closed container of not more than 5 gallons capacity, having a spring-closing lid and spout cover, designed to relieve internal pressure, and equipped with an internal spark arrestor. Most plastic flammable storage containers don't meet this criterion.

E. General:

1. All tanks, containers, and pumping equipment (portable or stationary) used for the storage or handling of flammable and combustible liquids shall have an approved rating by UL or FM.

2. All tanks and containers shall be properly labeled as to their contents and shall not be used for other purposes.

3. Only approved containers and portable tanks shall be used for the storage and handling of flammable and combustible liquids. All containers shall be labeled as to their contents.

4. All materials are to be stored, handled, and piled with due regard to their referenced fire characteristics.

5. Fuel and oil spills shall be promptly cleaned up, using appropriate methods.

6. Warning signs prohibiting smoking and open flames will be posted, maintained, and enforced 25 feet around storage areas for fuel and other flammable and combustible materials.

7. All sources of ignition are prohibited in areas where flammable liquids are stored, handled, and processed. Suitable "No Smoking" signs must be posted throughout such areas.

8. Flammable or combustible liquids will not be stored in any enclosed building without approval of the local Fire Department, and/or a qualified PCS safety inspector. Upon the local Fire Department's approval, those quantities shall be limited to and not greater than for one days use.

9. Flammable or combustible liquids shall not be stored in areas for exits, stairways, or those normally used for the passage of people.

10. Bulk storage of flammable or combustible liquids will not be allowed onsite without the approval of the local Fire Department, and/or a qualified PCS safety inspector.

11. Smoking or open flames within 35 feet of where flammable liquids or gases are being used, stored, or transferred, or where equipment is being fueled, are prohibited.

12. At least one portable fire extinguisher having a rating of not less than 2A:10B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

13. At least one portable fire extinguisher having a rating of not less than 20B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

F. Paints and Painting (Flammables):

1. Packages containing paints, varnishes, lacquers, thinners, or other volatile painting materials shall be kept tightly closed when not in use and shall be stored in accordance with the National Fire Protection Association/Standards (NFPA/S) recommendations, as note below:

    a. Containers of paints, varnishes, lacquers, thinners, and other flammable paint materials stored indoors shall be kept in metal storage cabinets meeting the requirements of the Uniform Fire Code and NFPA 30.

    b. Paint-soiled clothing and drop cloths, when not in use, shall be stored in well ventilated, self-closing steel cabinets or containers.

    c. Paint scrapings and paint-saturated debris shall be removed daily from the premises. Responsible employees are required to perform these functions in accordance with all applicable laws and regulations.

d. Ventilation will be established for the adequate prevention of the accumulation of flammable vapors, where hazardous levels may prove dangerous.

e. Smoking, open flames, exposed heating elements, or other sources of ignition are not permitted in areas or rooms where spray painting is being conducted.

f. Spray paint hoods, respirators, and other clothing or equipment shall be in accordance with recommendations of NFPA.

Note: For additional information please refer to Section 2.4 - Hazard Communication #7 of this manual in regard to the application of floor sealers, specialty paints, traffic coatings and epoxies.

2.8 FALL PROTECTION

A. Scope:

This section defines the minimum safety requirements for PCS personnel while performing work from heights greater than four feet on PCS job-site Projects.

B. Purpose:

To prevent injury to employees exposed to falls while performing work from heights, such as, steel erection, concrete forming, accessing work areas or walking working surfaces. All PCS employees working around areas where Fall Protecting is of consideration, are required to be familiar with the guidelines set below.

Falls are ranked as the leading cause of death and serious injury in construction. PCS' 100% fall protection is to be implemented when employees are exposed to a fall hazard of four (4) feet or greater. Employees are required to check in with their job-site supervisors for guidance in use of fall arrest systems or fall restraint systems (including guardrail systems).

C. Reference:

Refer to: OSHA - 29 CFR 1926 Subparts E & M, OSHA Standard Interpretation,

Washington State: WAC 296-155 Parts C & C-1, ANSI A10.32-2004 and Sections 2.3 PPE, 2.11 Floor & Wall Openings,

Sections 2.10 - Ladders & Stairways of this manual.

D. Definitions:

1. ***Anchorage*** – A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of withstanding the forces applied.

2. ***Approved*** – For the purpose of this policy, tested and certified by the manufacturer, or any recognized national testing laboratory, to possess the strength requirements specified in this section.

3. ***Full Body Harness*** – A configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration device.

4. ***Full Body Harness System*** – A Class III full body harness and lanyard which is attached to an anchorage meeting the requirements of Chapter 296-155 WAC, Part C-1; or attached to a horizontal or vertical lifeline which is properly secured to anchorage(s) capable of withstanding the forces specified in the applicable sections of Chapter 296-155 WAC, Part C-1.

5. ***Competent Person*** – An individual knowledgeable about fall protection equipment, including the manufacturers recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing

and potential fall hazards; has the authority to take prompt corrective action to eliminate those hazards; and is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

6. ***Connector*** – A device that 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 (such as a buckle or D-ring sewn into a body belt or body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

7. ***Control Zone*** – The area between the warning line system and unprotected sides and edges of the walking/working surface.

8. ***Deceleration Device*** – Any mechanism, such as a rope grab, ripstitch lanyard, specifically woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, 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.

9. ***Deceleration Distance*** – The additional vertical distance a falling employee 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 an employee's body belt or 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 employee comes to a full stop.

10. ***Drop Line*** – A vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

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

12. ***Fall Arrest System*** – The use of multiple, approved safety equipment components such as body harnesses, lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to arrest a free fall. Compliance with anchorage strength requirements specified in the applicable sections of Chapter 296-155 WAC.

13. ***Fall Protection Work Plan*** – A written document in which the employer identifies all areas on the job site where a fall hazard of 10 feet or greater exists. The plan describes the method or methods of fall protection to be utilized to protect employees, and includes procedures governing the installation use, inspection, and removal of the fall protection method or methods, which are selected by the employer. (WAC 296-155-24505)

14. ***Fall Restraint System*** – An approved device and any necessary components that function together to restrain an employee so that the employee is prevented from falling to a lower level. When standard guardrails are selected, compliance with applicable sections governing their construction and use shall constitute approval.

15. ***Fall Distance*** – The actual distance from the employee's support to the level where a fall would stop.

16. ***Free Fall*** – The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

17. ***Free Fall Distance*** – 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. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before it operates, and fall arrest forces occur.

18. ***Hardware*** – Snap hooks, D rings, bucklers, carabiners, adjusters, and O-rings that are used to attach the components of a fall protection system together.

19. ***Horizontal Lifeline*** – A rail, rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorages and used for attached to a worker's lanyard or lifeline device while moving horizontally. A horizontal lifeline is used to control dangerous pendulum like swing falls.

20. ***Lanyard*** – A flexible line of webbing, rope, or cable point usually 2, 4, or 6 feet long used to secure a body belt or harness to a lifeline or an anchorage.

21. ***Leading Edge*** – The advancing edge of a floor, roof, or formwork, which changes location as additional floor, roof, or formwork sections are placed, formed, or constructed. Leading edges not actively under construction are considered to be "unprotected sides and edges," and positive methods of fall arrest or fall restraint shall be required to protect exposed workers.

22. ***Lifeline*** – A vertical line from a fixed anchorage or between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured. Lifeline as referred to in this text is one that is part of a fall protection system used as back-up safety for an elevated worker.

23. ***Locking Snap Hook*** – A connecting snap hook that requires two separate forces to open the gate (one to deactivate the gatekeeper and a second to depress and open the gate which automatically closes when released) and is used to minimize roll out or accidental disengagement.

24. ***Low Pitched Roof*** – A roof having a slope equal to or less than 4 in 12.

25. ***Mechanical Equipment*** – All motor or human-propelled, wheeled equipment except for wheelbarrows, mop carts, robotic thermoplastic welders, and robotic crimpers.

26. ***Positioning Belt*** – A belt that can be secured around the worker's body to hold the user in a work position (i.e., a lineman's belt, rebar belt, or saddle belt).

27. ***Positioning Device System*** – A 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.

28. ***Restraint Line*** – A line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to prevent them from falling to a lower level.

29. ***Roll Out*** – Unintentional disengagement of a snap hook caused by the gate being depressed under torque or contact while twisting or turning.

30. ***Roof*** – The exterior surface on the top of a building. This does not include floors or formwork that temporarily becomes the top surface of a building because a building has not been completed.

31. ***Roofing Work*** – The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including construction of the roof deck.

32. ***Rope Grab*** – A fall arrester that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the belt or harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for all restraint applications. (WAC 296-155-24510)

33. ***Safety Line*** – Refer to Lifeline.

34. ***Safety Monitor System*** – A system of fall restraint used in conjunction with a Warning Line System, where a Competent Person, having no additional duties, monitors the proximity of workers to the fall hazard when working between the warning line and unprotected sides and edges, including the leading edge of a low pitched roof or walking/working surface.

35. ***Self Retracting Lifeline*** – A deceleration device that contains a drum wound line which may be slowly extracted from or retracted onto the drum under slight tension during normal employee movement and, after onset of a fall, automatically locks the drum and arrests the fall.

36. ***Shock Absorbing Lanyard*** – A flexible line of webbing, cable, or rope used to secure a body belt or harness to a lifeline or anchorage point that has an integral shock absorber.

37. ***Snap Hook*** – A self-closing connecting device with a gatekeeper latch or similar arrangement that remains closed until manually opened.

38. ***Static Line*** – Refer to Horizontal Lifeline.

39. ***Strength Member*** – Any component of a fall protection system that could be subject to loading in the event of a fall.

40. ***Steep Roof*** – A roof having a slope greater than 4 in 12.

41. ***Unprotected Sides and Edges*** – Any side or edge (except at entrances to points of access) of a floor, roof, ramp or runway where there is no wall or guardrail system, as defined in WAC 296-155-505.

42. ***Walking/Working Surface*** – For the purpose of this section, any area whose dimensions are 45 inches or greater in all directions, through which workers pass or conduct work.

43. ***Warning Line System*** – A barrier erected on a walking/working surface or a low pitch roof (4 in 12 or less), to warn employees that they are approaching an unprotected fall hazard(s).

44. ***Work Area*** – The portion of a walking/working surface where job duties are being performed.

45. ***100% Fall Protection*** - The use of a double lanyard system to ensure the fall arrest system remains in effect at all times when repositioning from one work location to another.

E. General:

1. PCS employees working on any PCS Project must comply with the PCS 100% Fall Protection Policy, which are in accordance with all WAC, and OSHA Standards.

2. The use of a Warning Line System as prescribed in WAC 296-155-24515(3) and supplemented by the use of a Safety Monitor System as prescribed in WAC 296-155-24521 to protect workers engaged in duties between the forward edge of the warning line and the unprotected sides and edges, including the leading edge, of a low pitched roof or walking/working surface is prohibited!

   NOTE: In order for the Warning Line and Safety Monitor System not to be used, employees must first demonstrate, in writing, to either their supervisor or a PCS Safety inspector, that the use of a fall arrest or restraint system is not feasible.

3. Prior to bring permitted into areas where fall hazards exist, employees must:

   a. Be fully trained and instructed in the items described in this section.

   b. Fully understand fall protection devices and systems as they relate to their safety and the safety of others.

E. Fall Protection Work Plan:

As referenced in WAC 296-155-24505 and Document 00860 Safety Management, PCS has developed and implemented a written Fall Protection Work Plan for each area of the work place where employees are assigned, and where fall hazards greater than ten (10) foot exist. A copy of the plan is on file in the PCS Human Resources' office.

1. The Fall Protection Work Plan:

   a. Identifies all fall hazards in the work area.

   b. Describes the method of fall arrest or restraint to be provided.

c. Describes the correct procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used.

d. Describes the correct procedures for the handling, storage, and securing of tools and materials.

e. Describes the method of providing overhead protection for workers who may be in or pass through the area below the work site.

f. Describes the method for prompt, safe removal of injured workers.

g. Is always made available at each job-site for reference.

Note: A template of the Department of Safety and Health's (DOSH) Fall Protection Work Plan can be found on page 2.8.15 of this manual.

F. Employee Training:

1. Qualified PCS staff personnel have been designated to provide the various training requirements noted by this section.

2. The program includes training and instruction in the following areas:

a. The recognition and identification of fall hazards in the work area;

b. The use and operation of guardrail systems (including perimeter safety cable systems), personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other protection to be used;

c. The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;

d. The procedures to be followed to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls; and

e. The procedures for the prompt, safe removal of injured workers or those suspended as a result of a fall.

f. The fall protection requirements of this manual.

g. Training of employees is required and shall be documented and available at the job site.

Note any employee who feels they have not received any related training is advice to contact their immediate supervisor.

G. Fall arrest protection generally consists of one or more of the following:

1. Full body harness system.

a. An approved Class III full body harness shall be used.

b. Body harness systems or components subject to impact loading shall be immediately removed from service and shall not be used again for employee protection.

c. All safety lines and lanyards shall be protected against being cut or abraded.

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

e. Body harness systems shall be rigged to minimize free fall distance with a maximum free fall distance allowed of 6 feet, and such that the employee will not contact any lower level.

f. Hardware shall be drop forged, pressed or formed steel, or made of materials equivalent in strength.

g. Hardware shall have a corrosion resistant finish. All surfaces and edges shall be smooth to prevent damage to the attached body harness or lanyard.

h. When vertical lifelines (droplines) are used, not more than one employee shall be attached to any one lifeline.

i. System strength needs in the following items are based on a total combined weight of employee and tools of no more than 310 pounds. If combined weight is more than 310 pounds, appropriate allowances must be made or the system will not be deemed to be in compliance:

    i. Full body harness systems shall be secured to anchorages capable of supporting 5,000 pounds per employee; except when self-retracting lifelines or other deceleration devices are used which limit free fall to two feet, anchorages shall be capable of withstanding 3,000 pounds.

    ii. Vertical lifelines (drop lines) shall have a minimum tensile strength of 5,000 pounds (22.2 kN), except that self-retracting lifelines and lanyards that automatically limit free fall distance to two feet (.61 m) or less shall have a minimum tensile strength of 3,000 pounds (13.3 kN).

    iii. Horizontal lifelines shall have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds (22.2 kN) per employee using the lifeline, applied anywhere along the lifeline.

    iv. Lanyards shall have a minimum tensile strength of 5M pounds (22.2 kN).

    v. All components of body harness systems whose strength is not otherwise specified in this subsection shall be capable of

supporting a minimum fall impact load of 5M pounds (22.2 kN) applied at the lanyard point of connection.

vi. Snaphooks are not be connected to loops made in webbing type lanyards.

vii. Snaphooks are not be connected to the webbing of the lanyard unless designed to do so.

viii. Not more than one snap hook shall be connected to any D-ring.

ix. Lanyards shall not be attached directly to a retractable device.

x. System components shall be compatible.

xi. Components used for fall protection shall be designed for such use and shall not be used for other purposes.

2. Safety Net Systems:

Safety net systems and their use shall comply with the following provisions:

a. Safety nets must be installed as close as practicable under the surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level unless specifically approved in writing by the manufacturer. The potential fall area to the net shall be unobstructed.

b. Safety nets must extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net.	*Minimum required horizontal distance of outer edge of net from the edge of the working surface.*
Up to 5 feet	*8 feet*
More than 5 feet/up to 10 feet	*10 feet*
More than 10 feet	*13 feet*

c. Safety nets must be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop-test specified.

d. Safety nets and their installations must be capable of absorbing an impact force equal to that produced by the drop-test specified.

i. Except as provided, safety nets and safety net installations are to be drop-tested at the job site after initial installation and before being used as a fall protection system. If relocated, after major

repairs, and at 6-month intervals, if left in one place, they must be tested again. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 ± 2 inches (76 ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards, but not from less than 42 inches (1.1 m) above that level.

ii. PCS Safety personnel can certify that a net installation is in compliance, if it is deemed unreasonable to perform the test. A certification record will be filed with the appropriate PCS personnel denoting all requires information

e. PCS Safety personnel will take steps to inspect safety nets at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence that could affect the integrity of the safety net system. Employees using these Safety Nets are required to also visibly inspect them and bring any information regarding any possible safety conditions to their immediate supervisor.

f. Materials, scrap pieces, equipment, and tools, which have fallen into the safety net, must be removed immediately.

g. Each safety net (or section of it) have border ropes for webbing, and possess a minimum breaking strength of 5,000 pounds (22.2 kN).

h. Connections between safety net panels must also be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

3. Catch Platforms (when required):

a. A catch platform can be installed within 6 vertical feet of the work area.

b. The width of the catch platforms should be equal to the distance of a potential fall, at a minimum of 45 inches in width. Any catch platform must also be equipped with standard guardrails on all open sides.

H. Positioning Device Systems:

PCS specifies that the positioning of device systems shall conform to the following provisions.

1. Positioning Devices must be rigged such that an employee cannot free fall more than 2 feet (.61 m).

2. Positioning Devices must be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 lbs (13.3 kN), whichever is greater.

3. Connectors must be drop forged, pressed or formed steel, or made of equivalent materials.

4. Connectors must have a corrosion-resistant finish. All surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.

5. Connecting assemblies must have a minimum tensile strength of 5,000 lbs (22.2 kN).

6. D-rings and snap-hooks will be proof-tested to a minimum tensile load of 3,600 lbs (16 kN) without cracking, breaking, or taking permanent deformation.

7. Positioning device systems must be inspected prior to each use for wear, burns, damage, and deterioration. Defective components shall be removed from service.

8. Harnesses and components must be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

I. Drop lines or lifelines used in areas where they may be subjected to cutting or abrasion shall be a minimum of 7/8-inch, wire core manila rope. For all other lifeline applications, a minimum of 3/4-inch manila or equivalent with a minimum breaking strength of 5,000 lbs shall be used.

J. Safety harnesses, lanyards, lifelines or droplines independently attached or attended shall be used while performing the following types of work when other equivalent type protection is not provided:

1. Work performed in confined spaces shall follow the procedures as described in Section III of the PCS Project Safety Plan and Chapter 296-809 WAC.

2. Work on hazardous slopes, dismantling safety nets from boatswain's chairs at elevations greater than six feet (6'), swing scaffold or other unguarded locations.

3. Work on skips and platforms used in shafts by crews when she skip or cage does not occlude the opening to within one foot of the sides of the shaft unless cages are provided.

K. Fall restraint protection as discussed in this section shall consist of:

1. Standard guardrails as described in the following sections of this manual:

   a. Section 2.9 – Scaffolding,

   b. Section 2.10 – Ladders & Stairways

   c. Section 2.11 – Floor & Wall Openings.

2. Harness attached to securely rigged restraint lines:

   a. Restraint protections must be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.

b. All harnesses and lanyard hardware assemblies must be capable of withstanding a tensile loading of 4,000 pounds without cracking, breaking, or taking a permanent deformation.

c. Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer, and used in strict accordance with the manufacturer's recommendations and instructions.

d. Components of fall restraint systems must be inspected prior to each use for mildew, burns, wear, damage, and other deterioration. Defective components shall be removed from service if their function or strength is adversely affected.

e Anchorage points used for fall restraint shall be capable of supporting four times the intended load.

Note: PCS ensures full component compatibility for all related fall equipment.

L. Leading Edge Control Zones:

When performing Leading Edge work, PCS' Safety Team will ensure that Control is established according to the following requirements:

1. Control Zones must begin a minimum of 6 feet back from the leading edge to prevent exposure by employees who are not protected by fall restraint or fall protection systems.

2. Control Zones must be separated from the other work areas by the erection of a warning line.

3. All PCSC employees entering into the Control Zone must utilize 100% fall protection.

M. Warning Lines:

When performing with Warning Lines, PCS' Safety Team will ensure that such use is established according to the following requirements:

1. Warning Lines must be constructed of wire, rope or chain supported by stanchions.

2. The spacing of the stanchions and support of a Warning Line must be such that it is not less than 36 inches from the work surface at its lowest point and not higher than 42 inches.

3. Each Warning Line must have a tinsel strength of 200 pounds.

4. Each Warning Line must be flagged or clearly marked with high visibility material not to exceed six (6) feet.

5. After being erected the Warning Line must be able to resist without tipping over, a force of at least sixteen (16) pounds.

6. Warning Lines utilized for the purpose of fall protection must be erected 15 feet from the unprotected building edge or opening.

7. Warning lines utilized for guarding of low pitched roofs shall be erected 6 foot from the unprotected building edge or opening.

8. Any employee working between the warning line and the roof edge shall utilize 100% fall protection.

N. Excavations:

1. Pits, excavations or caissons with vertical sides that expose employees to a fall hazard of 6 foot or greater must be guarded by standard guard rails, fall restraint or fall arrest systems.

2.9 SCAFFOLDING

A. Scope:

This section defines minimum safety requirements to be followed by all PCS employees when erecting, dismantling, moving, or altering scaffolding on any PCS job-site.

B. Purpose:

To prevent injury to PCS employees working on or around scaffolding, or to unrelated others in the vicinity. All PCS employees working around Scaffold are required to be familiar with the guidelines set below.

C. Reference:

Refer to: OSHA 29 CFR Subparts L & M, WAC 296-874

Section 2.8 Fall Protection of this manual.

D. Definitions:

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

2. ***Qualified Person*** - means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems related to the subject matter, work, or project. Scaffolds shall be designed by a Qualified Person, and constructed and loaded in accordance with that design.

E. General:

1. Scaffold shall be erected, moved, dismantled, or altered only under the supervision and direction of a PCS designated Competent Person, qualified in scaffold erection, moving, dismantling or alteration.

2. All scaffolding and stair towers must utilize the following tag system when being erected, altered, moved, or dismantled;

    a. All scaffolding shall have a color-coded tag, secured at the point of access, signed by a PCS Competent Person. (The Competent Person is required to inspect and tag the scaffolding prior to use, and daily thereafter to verify the applicability of the tag. The tag may be modified as necessary by the personnel.)

    b. ***Green Tag*** – Scaffold meets and/or exceeds all applicable regulations, thus is deemed safe to use.

c. ***Yellow Tag – WARNING*** – This scaffold does not comply with applicable regulations and has restrictions placed on it by the PCS Competent Person. EXAMPLE: Fall arrest protection may be required but not implemented.

d. ***Red Tag – DANGER*** – This scaffold is not to be used by any PCS employees, except by a qualified erecting crew, performing dismantling activities, alteration and possibly reinstallation and testing.

3. All scaffolds over 26 feet in height must be tied in to a structure, beginning at this height and every 26 feet thereafter. Scaffold must be anchored every 30 feet of length at the heights established in the preceding sentence. Scaffolds with a height to base width ratio greater than four to one (4:1) must also be secured from tipping

4. Scaffold footing must be sound and rigid, capable of supporting the intended weight. Unstable objects, such as bricks, are not be used in the supports.

5. When screw jacks are used to level the platform, they must be installed according to manufacture's specifications.

6. Scaffolds with a working decking of 6 feet in height must have a standard guardrail system on all open sides.

7. Top rails must be 2 x 4's, 42 inches high with vertical supports not to exceed 8 feet. Toe boards shall be 1 x 4's. Rails may be tubing of equivalent strength. Toe boards may be plate.

8. Midrails must be installed at a height approximately midway between the top edge of the guardrail system and the platform surface. Crossbraces may be used as a midrail provided the crossing point of the 2 braces is between 20 inches and 30 inches above the work platform.

9. Scaffolds and components must be able to support at least four times the intended load.

10. Any component of a scaffold damaged or weakened for any reason are to be immediately repaired or replaced.

11. The space between the bottom of the toe board and scaffold decking must not exceed 1/2 inch

12. Maximum span for 2" x 12" planks must be 8 feet.

13. Scaffolds shall be kept free of ice, grease, mud, or any other material or equipment that renders them unsafe or hazardous to personnel using them.

14. Where walkways and work surfaces are slippery, abrasive material must be used to ensure safe footing.

15. An access ladder or equivalent safe means of access must be provided at all work areas.

16. Each end of planking on platforms must be overlapped a minimum of 12 inches and secured from movement.

17. Scaffold planks must extend over their end support at least 6 inches, but not more than 12 inches.

18. Width of all scaffolds must be determined by their purpose, but in no case shall they be less than 18 inches. They must be sufficiently wide to eliminate passageway congestion and facilitate material supply and personnel movement

19 Scaffolds supported by an outrigger boom, hoist, well pulley, or any other device or equipment used for hoisting material will be permitted, provided the platform of scaffold supports and the individual member to which each device is attached is reinforced and braced to withstand the additional loads imposed.

20. Protection must be provided for personnel on a scaffold exposed to overhead hazards.

21. Wire rope used for scaffold suspensions must be capable of supporting six times the intended load.

22. Shore or lean-to scaffolds are prohibited.

23. Scaffolds exceeding 125 feet in height must be designed and erected under the supervision of a PCS designated Professional Engineer, competent in this field.

24. Narrow gauge scaffolds (30 inches wide) are not to be erected with working platform above 4 feet unless equipped with outriggers.

25. Casters shall be designed and capable of supporting the load imposed.

26. Rolling scaffolds with personnel aloft are prohibited from being moved.

27. When personnel work or pass under a scaffold, a screen or mesh or the equivalent must be provided between the toe board and top rail.

F. Tubular Welded Frame:

1. The scaffold and its component parts must be designed to support four times the rated load.

2. Scaffolds must be braced, and the braces shall be of the proper length so that the scaffold will remain plumb and rigid.

3. Scaffold legs must bear on base plates that rest on mud-sills or other firm foundations such as concrete.

G. Float:

1. A float scaffolding must be hung from overhead supports by means of ropes, and shall consist of a substantial platform having diagonal bracing underneath and

resting upon, and securely fastened to two parallel plant bearers at right angles to the span.

2. The platform must not be less than 3 feet wide and 6 feet long, made of 3/4- inch plywood equivalent to American Plywood Association Grade B-B, Group I, exterior or similar material.

3. The two supporting bearers must be 2" x 4" or 1" x 10" rough selected lumber or better. They shall be free of knots and shall project 6 inches beyond the platform on both sides and ends of the platform and extend 6 inches beyond the bearers.

4. An edging of wood not less than 2" x 4" or equivalent must be placed around all sides of the platform to prevent tools from rolling off.

5. Supporting ropes must be 1-inch manila rope or equivalent with connections so that the platform cannot slip, and shall be securely fastened to an overhead support.

6. All employees working on floats must wear a full body safety harness with a lanyard tied off to an independent static line or structure meeting fall arrest requirements as determined by the competent person.

H. Swinging Scaffolds – Two-Point Suspension:

1. Two-point suspension scaffold platforms must not be less than 20 inches or more than 36 inches wide overall. The platform must be securely fastened to the hangers by U-bolts or by other equivalent means.

2. The hangars of two-point suspension scaffolds must be capable of sustaining four times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toe boards.

3. Wire, synthetic, or fiber rope capable of supporting at least six times the rated load must suspend two-point suspended scaffolds. All other components must be capable of supporting at least four times the rated load.

4. No more than two employees are to be permitted to work at one time on suspension scaffolds designed for a working load of 500 pounds. No more than three employees are to be permitted to work at one time on suspension scaffolds with a working load of 750 pounds. An approved full body safety harness attached to an independent lifeline shall protect each employee. Lifelines must be securely attached to substantial members of the structure (not scaffold), or to rigged lines, which will safely suspend the employee in case of a fall.

5. Manufactured metal-type platforms, when used, must be tested and of a type listed according to Underwriters Laboratories or Factory Mutual Engineering Corporation or some other recognized authority for suitable certification.

I. Scaffold Planks:

Employees responsible for planks must inspect them on a daily basis. The planks must conform to the established structural grades. Any split or damaged plank must be removed from service and replaced.

Plank identification may be accomplished by painting ends with bright colors for easy identification. Plank ends may also be banded with iron bands to prevent splitting.

J. Stair-tower Scaffolds:

1. In addition to meeting the requirements within this section, all WAC 296-974, stairways must also meet WAC 296-155-477 requirements.

2.10 LADDERS & STAIRWAYS

A. Scope:

This section defines minimum safety requirements and must be followed by all PCS employees where access and egress issues are a part of there job requirements on any PCS job-site.

B. Purpose:

To prevent injury to employees while accessing elevated work areas using ladders, stairs or ramps. All PCS employees working with or around Ladders & Stairways are required to be familiar with the guidelines set below.

C. Reference:

Refer to: OSHA: 29 CFR Subpart X,

Washington State: WAC 296-876,

Section 2.8 - Fall Protection of this manual.

D. Definitions:

1. ***Job-made Ladder*** – A ladder that is project fabricated, not commercially manufactured.
2. ***Portable Ladder*** – A ladder that can be easily moved or carried.
3. ***Step Ladder*** – A self-supporting, foldable, portable ladder.
4. ***Extension Ladder*** – A portable ladder adjustable in length consisting of a base ladder with an adjustable extension section.

E. General:

1. A ladder, stairway, or ramp shall be provided at all personnel points of access where there is a break in elevation of 19” or greater.
2. Ladders, stairways and landings shall have unobstructed access at the top and base and be free of debris.
3. Manufactured ladders must be rated for extra heavy duty work.
4. Contractors shall provide ladders which are safe and in accordance with all applicable codes and standards.
5. Employees that use ladders must be trained by a competent person to recognize hazards and procedures to minimize those hazards:
    a. The proper construction, placement, care, use and handling of ladders.

b. The maximum intended load capacities of ladders that are used.

c. Requirements of WAC 296-876.

6. Contractors must have a ladder safety inspection program with a competent person designated to make such inspections.

7. Ladders with broken or missing rungs or steps, broken or split side rails or other damage must be immediately removed from service by tagging “out of service” and removing it from the work area by the end of shift.

8. Ladders must not be painted with opaque material other than for identification marking.

9. Ladders made of conductive material must not be used where electrical hazards exist.

10. Ladders must be placed on a substantial base.

11. Ladders must not be placed in passageways or doorways, unless the door is blocked open, locked shut, or guarded from opening into the ladder.

12. The area at the base of ladders should be delineated to safe guard others working in the area.

13. Ladders used in areas subject to vehicle traffic must be demarcated around the base also.

14. Ladders must not be used in a horizontal position as platforms, runways, scaffolds, or structural members.

15. When ladders are used for access to upper landing surfaces, ladder side rails must extend not less than 36 inches (3 rungs) above a landing.

16. Ladders should be accessed using both hands, facing the rungs.

17. Ladders are not be used by more than one person at a time unless so designed, and never more than two persons.

18. Tools to be used while working on a ladder, should be retrieved by use of a rope haul or hoist so that 3-point contact is maintained and the worker's stability will not be compromised.

F. Job-Made Ladders:

1. Job-made ladders must be constructed for their intended use. If a ladder is to provide the only means of access or exit from a working area for 25 or more employees, or simultaneous two-way traffic is expected, a double- cleat ladder shall be installed. Job-made ladders may be used if such a pitch exists that the horizontal distance from the top support to the foot of the ladder is approximately 1/4 of the working length of the ladder.

2. Double-cleat ladders must not exceed 24 feet in length; single- cleat ladders shall not exceed 30 feet in length. 2 x 4 lumber shall be used for side and middle rails of double cleat ladders up to 12 feet in length; 2 by 6-inch lumber shall be used for double-cleat ladders from 12 to 24 feet in length. Cleats must be inset into the edges of the side 1/2 inch or filler blocks must be used on the rails between the cleats. The cleats must also be secured to each rail with common wire nails or other fasteners of equivalent strength. Cleats are to be uniformly spaced, 12 inches top to top.

3. The width of single-cleat ladders must be at least 15 inches, but not more than 20 inches, between rails at the top. 2 x 4 lumber must be used for single cleat ladders up to 16 feet in length; 3-inch (or 2 x 6) lumber must be used for single-cleat ladders from 16 to 30 feet in length.

4. Side rails must be parallel or flared top-to-bottom by no more than 1/4 inch for each 2 feet of length. If possible, side rails should be continuous. If splicing is necessary to attain the required length, the splice must develop the full strength of a continuous side rail of the same length.

G. Portable Ladders:

1. Extension Ladders

   a. Extension ladders must be equipped with anti-slip feet.

   b. The fly section of an extension ladder must net be used alone.

H. Step Ladders:

1. Stepladders must only be used as designed, completely opened with latches locked.

2. The top two steps (top rung and top platform member of stepladders) are not to be used for access.

I. Stairways:

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

   a. At least one handrail; and

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

2. Metal pan treads and landings, when used for access prior to completion, must be fitted with secured, temporary fillers long and high enough to cover the entire area.

J. Ramps and Inclined Walkways:

1. Ramps and inclined walkways must be eighteen inches or more wide.

2. Ramps must have standard railings when located four or more feet above the ground.

3. Ramps must not be inclined more than twenty-four degrees and shall be cleated or otherwise treated to prevent slippage and secured to prevent displacement.

   Note: Double headed nails must not be used for the construction of ladders, stairways, or ramps.

2.11 ELEVATED WORK PLATFORMS SAFETY PROCEDURES

A. Scope:

This section defines the minimum safety requirements for Contractors to follow while utilizing elevating work platforms on PCS construction projects.

B. Purpose:

This section is intended to define basic safety rules during the operation of Elevated Work Platforms. All PCS employees working around areas where Elevated Work Platforms are of consideration, are required to be familiar with the guidelines set below

C. Reference:

Refer to: OAHA: 29 CFR 1926 Subpart L,

Washington State: WAC 296-24-875 WAC 296-155-487

D. Definitions:

1. ***Aerial Lift*** – Any vehicle-mounted device, telescoping or articulating or both, that is used to position workers and/or materials.

2. ***Aerial Ladder*** – An aerial device consisting of a single or multiple section extensible ladders.

3. ***Boom Supported Elevating Work Platforms*** - An aerial device (except ladders) with a telescopic or extensible boom that can be raised or lowered with an attached work platform.

4 ***Elevating Work Platform*** – A device used to position personnel, along with their necessary tools and materials, at work locations. It includes a platform and an elevating assembly. It may be vehicle mounted or have an integral chassis for mobility and as a means of support.

E. General:

1. Aerial Devices, include the following types of vehicle-mounted Aerial Devices used to elevate personnel and/or material to job-sites above ground:

    a. Extensible boom platforms;

    b. Aerial ladders;

    c. Articulating boom platforms;

    d. Scissor lifts

2. PCS only allows trained individuals to operate such equipment and maintains all documentation of training.

3. On a daily basis, before use, each Aerial Devices must be given a thorough inspection.

4. Lift controls must be tested each day prior to use to determine that such controls are in safe working condition.

5. Any platform found to be in unsafe working condition is to be removed from service until repaired and re-certified for service.

6. Before an Aerial Device is elevated, the operator must check the location of overhead obstructions.

7. Platforms must maintain a minimum distance of ten (10) feet from energized overhead electrical lines.

8. Platforms utilized in areas subject to vehicle traffic must be "demarcated" around the base.

9. Platforms utilized in areas frequented by other workers or the public must also be demarcated around the base.

10. Certified flaggers and/or substantial barricade protection must be used where lifts are subject to being struck by vehicles or equipment.

11. Wheels are to be chocked when parked on an incline.

12. Load limits specified by the manufacturer are not be exceeded. Material to be lifted must be contained inside the platform, basket, or on certified attachments. Guardrails are not be used to support material.

13. Lifts must not be operated when wind speeds exceed 25 mph.

14. Lifts may be used to gain access to an elevated area where the operator must leave the lift to access the work area when the following conditions are met:

    a. The operator must be protected from falling by an approved fall protection system anchored to the elevated structure.

    b. The operator must be connected to the fall protection system before climbing the guardrail to leave the lift.

    c. The operator must not perform any work from the lift platform while connected to the structure.

    d. The operator must not be connected to the lift while climbing to the work area of the structure or working from the structure.

e. When employees must leave the lift to access an elevated work area ten (10) feet or greater above the ground a written Fall Protection Work Plan must be completed.

i. The written fall protection plan must properly address rescue procedures when employees exit the lift to perform task outside of the lift.

F. Ladder and Tower Trucks:

1. Before a truck is moved for highway travel, aerial ladders must 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 (i.e., cradles that prevent rotation of the ladder in a combination with positive acting linear actuators).

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

G. Articulating Boom Platforms:

1. A full body harness must be worn and a lanyard attached to the point specified by the lift manufacturer when in operation.

2. Employees must always stand firmly on the floor of the basket when moving the lift or working.

3. The brakes must be set and outriggers, when used, shall be positioned on pads or a solid surface.

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

5. All work platforms must be fitted with a tilt alarm or other suitable warning system that activated when the machine base is more than 5 degrees out of level in any direction.

H. Scissor Lifts:

1. Ensure the lift is situated on firm level ground before the platform is elevated.

2 Before the lift is moved, make sure the platform is properly cradled and the outriggers are in the stowed position. Additionally, ground level employee(s) must check for debris, un-tampered earth, drop-offs or holes. All tools or parts must be secured prior to moving the lift.

Note: Exception: The aerial lift may be moved while elevated, with personnel on the platform, only if the equipment is specifically designed for this type of operation.

3. Employees are required to always stand firmly on the floor of the platform when moving the lift or working.

4. All guardrail sections must be checked and securely bolted to the machine.

5. The entrance rail or chain must be put in place once the employee has entered the lift.

2.12 POWER INDUSTRIAL TRUCKS

A. Scope:

This section outlines minimum safety requirements to be followed by PCS personnel operating and maintaining Powered Industrial Trucks (forklifts) on PCS projects.

B. Purpose:

This intent of this program is to eliminate or minimize the potential for injury to personnel or the public, and property damage to equipment, and facilities. All PCS employees operating and maintaining Powered Industrial Trucks are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: OSHA: 29 CFR 1910.178,

Washington State: WAC 296-863, American National Standards Institute (ANSI): B56.1-1975, B56.1-1993

D. Definitions:

1. ***Powered Industrial Truck*** – Any fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial truck powered by an electric motor or internal combustion engine. This definition does not include vehicles designed primarily for earthmoving or over the road hauling that have bucket-mounted forks.

2. ***Critical Pick*** – Any lift exceeding 75% of the machines rated capacity, any lift involving more than one machine, or any lift involving unusual or severe circumstances.

E. General:

1. All Powered Industrial Trucks in use by PCS shall meet the applicable requirements of design, construction, and stability as defined by the American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks. All powered industrial trucks acquired and used by PCS on or after March 1, 2000, must meet the applicable requirements of design, construction, and stability as defined in American Society of Mechanical Engineers (ASME) B56.1-1993. PCS will ensure that all Powered Industrial Trucks are inspected, maintained, and operated in accordance with this section and the manufacturer's recommendations and specifications.

2. Trucks shall have a label indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1-1969.

3. Modifications or additions shall only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

4. If the truck is equipped with front-end attachments other than factory-installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.

5. The user must ensure that all nameplates and markings are in place and legible.

6. Gasoline and un-scrubbed diesel powered industrial truck use is forbidden indoors.

7. Liquid Propane (LP) is Carbon Monoxide (CO) producing. When CO producing equipment is utilized "indoors" the Contractor shall have an accepted plan in place to monitor and mitigate the hazards to workers.

8. Before making a critical pick the Contractor's shall submit a written plan to the Engineer for review prior to such work beginning.

9. Lifting Employees on the Forks of Trucks

   Note: Due to advances in technology and the availability of elevating work platforms, forklifts are not be used to elevate personnel under any conditions!

10. Lighting for Operating Areas:

    a. Adequate lighting should be provided in operating areas.

    b. Where general lighting is inadequate, directional lighting must be provided on the truck.

F. Operator Requirements for Powered Industrial Trucks:

1. Safe Operation:

   a. PCS will ensure that each Powered Industrial Truck Operator is trained in the safe operation of any truck, and is competent to operate a Powered Industrial Truck safely.

   b. Prior to permitting an employee to operate a Powered Industrial Truck (except for training purposes), PCS will ensure that each operator has successfully completed the training required by this section.

   c. Operators must be in possession of a valid Training Certification Card.

2. Training Program Implementation:

   a. Trainees may operate a Powered Industrial Truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and where such operation does not endanger the trainee of other employees.

Note: Only certified and qualified person of PCS's choosing may give required training and evaluation.

b. Training will consist of formal instruction and/or practical training, conveyed in a manner to insure the trainee's full understanding.

Note: Formal instruction may include lectures, discussion, interactive computer learning, videotape and/or written material. Practical training may include demonstrations performed by the trainer and practical exercises performed by the trainee.

3. Training Program Content:

Powered Industrial Truck Operator must receive initial training in the topics that follow, except in topics that are not applicable to the safe operation of the truck in the employer's workplace.

a. Truck-Related Topics

i. Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate.

ii. Differences between the truck and the automobile.

iii. Controls and instrumentation: where they are located, what they do, and how they work.

iv. Engine or motor operation.

v. Steering and maneuvering.

vi. Visibility (including restrictions due to loading).

vii. Fork and attachment adaptation, operation, and use limitations.

viii. Vehicle capacity.

ix. Vehicle stability.

x. Vehicle inspection and maintenance that the operator will be required to perform.

xi. Operating limitations.

xii. 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.

b. Workplace-Related Topics

i. Surface conditions on which the vehicle will be operated.

ii. Composition of loads to be carried and load stability.

iii. Load manipulation, stacking, and unstacking.

iv. Pedestrian traffic in areas where the vehicle will be operated.

v. Hazardous (classified) locations where the vehicle will be operated.

vi. Ramps and other sloped surfaces that could affect the vehicle's stability.

vii. Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust.

viii. Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

4. Re-Training:

Re-training in relevant topics will be provided to the operator when:

a. The operator has been observed to operate the vehicle in an unsafe manner.

b. The operator has been involved in an accident or near-miss incident.

c. The operator has received an evaluation that reveals he/she is not operating the truck safely.

d. The operator is assigned to drive a different type of truck.

e. The condition of the workplace has changed in a manner that could affect the safe operation of the truck.

Note: Re-Training must be provided to an operator every three years.

5. Avoidance and Duplicative Training:

If an operator had previously received training in a topic specified in paragraph 3 - Training Program Content of this manual, and such training is appropriate to the Truck and working conditions encountered, additional training in that topic is not required, provided the operator can provide proof of such training, and has been within three years, and PCS will verify operator's competency.

6. Record keeping:

PCS will maintain all records showing relating to each operator's training

7. Operator Identification:

   Operators who have successfully completed training shall be identified with a visible hardhat sticker that clearly denotes the date of course completion.

G. Operating Powered Industrial Trucks:

1. Industrial Trucks (forklifts) must be inspected at the beginning of each shift or when first used on any shift. Inspections shall be recorded on a daily inspection sheet. If an operational or mechanical defect is found, the equipment shall be tagged "Out-of-Service" until proper repairs have been made. Prior to using a forklift during the shift, each respective PCS operator must check the daily inspection sheet to ensure the inspection for that day has been completed.

2. No operator may drive a truck up to anyone standing in front of a fixed object.

3. All PCS Trucks shall have an audible reverse alarm.

4. No personnel may stand or pass under the elevated portion of any Truck, whether loaded or empty.

5. PCS employees are not authorized to allow persons to ride on Industrial Trucks unless the Truck is equipped for additional passengers, or co-operators.

6. Employees are prohibited from placing any body parts between the uprights of the mast or outside the running lines of the truck

7. When an operator leaves the seat and leaves the Controls of a Powered Industrial Truck unattended:

   a. The forks or load shall be lowered to the ground;

   b. The controls shall be neutralized;

   c. The power shall be shut off;

   d. The brakes shall be set.

   e. The wheels shall be blocked, if the Truck is parked on an incline.

8. Operators must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car.

   Note: Floor stops may be required.

9. Operators must leave enough headroom for Trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.

10. An Active Operator Protection Restraint (AOPR) device (such as a seatbelt or lap-bar) must be used by all PCS personnel when operating any Powered Industrial Trucks.

H. Traveling in a Powered Industrial Truck:

1. The operator must remain at a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.

2. Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.

3. Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 25 feet from the center of railroad tracks.

4. The operator must look in the direction of, and keep a clear view of the path of travel.

5. Stunt driving/horseplay are prohibited and will be grounds for disciplinary actions.

6. Operators must be cognizant of road conditions and avoid running over loose objects on the roadway surface.

I. Traveling Speeds of Powered Industrial Trucks:

1. Operators must observe all traffic regulations, including authorized plant speed limits.

2. Operators must slow down and sound the horn at cross aisles and other locations where vision may be obstructed. If the load obstructs a forward view, the driver must travel with the load trailing. Exception: If traveling with the load trailing creates new hazards, this may not required.

3. Operators are required ascend and descend grades slowly.

    a. At grades over 10 percent, loaded trucks must be driven with the load "upgrade".

    b. Unloaded trucks should be operated on all grades with the load carrier "downgrade".

    c. On all grades the load and load carrier shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

4. Under all travel conditions, Trucks must be operated at a speed that will permit them to be stopped safely.

5. Operators must slow down for wet and slippery floors, or when driving on plates.

6. While negotiating turns, operators must slow to a safe speed and turn the wheel in a smooth, sweeping motion.

J. Loading Powered Industrial Trucks:

1. All loads shall be within the rated capacity of the truck.

2. All loads shall be stable and safely arranged. Operators must exercise caution when handling off-center loads, that cannot be centered.

3. Care must be taken when securing, manipulating, positioning, and transporting loads when attachments are used. Place the load carrier under the load as far as possible. Then tilt the mast backward to stabilize the load.

4. Operators must use extreme caution when tilting the load forward or backward, particularly when high tiering. Avoid tilting the load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.

5. When stacking or tiering, ensure that other workers are not on the back side and subject to being struck by a falling load.

K. Maintaining Powered Industrial Trucks:

1. Industrial trucks must be removed from service when not in safe operating condition. An authorized PCS employee or PCS designation service representative must make all repairs.

2. When repairs to fuel and ignition systems of Industrial Trucks are to be made, that might create a fire hazard, appropriate Fire Protection Equipment must be made available and ready.

3. Industrial Trucks in need of repairs to the electrical system must have the battery disconnected prior to fuel related repairs.

4. Industrial Truck parts must be replaced only by parts with equivalent safety ratings.

5. Industrial Trucks must not be altered without authorized PCS representative reviewing the manufacturers intend for usage and approving any such alteration.

6. Trucks must not have additional counterweight added, unless approved by the truck manufacturer's specifications as related to PCS' liability standing.

7. Industrial Trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease

2.13 EARTHWORK ACTIVITIES & HEAVY EQUIPMENT

A. Scope:

This section defines minimum safety requirements for Earth Moving Operations, maintenance and fueling, site conditions and the safety of the general public. Equipment is defined to include motor vehicles, earthmoving equipment and over the road and onsite haul trucks.

B. Purpose:

To safeguard employees and members of the public, and to eliminate equipment and property damage. All PCS employees involved in Earth Moving Activities, utilizing Heavy Equipment are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: OSHA - 29 CFR Subparts O, P & W,

Washington State: WAC 296-155-605(i)(h), WAC 296-155 Part E & M,

Section 2.19 Excavation & Trenching of this manual.

Reference material of note: The Federal Motor Carriers Safety Administration in 2006 estimated that truck crashes cost an average of $91,000 per crash. According to a 1991 NIOSH report, there were 841 road construction fatalities between1992-1998. Of those 493 occurred "inside" work zones with the leading cause of death to construction workers on foot being trucks (61%), followed by construction equipment (30%).

D. General Requirements:

1. PCS will insure that only experienced, trained and qualified personnel are allowed to operate the equipment noted in this Section. Furthermore, PCS requires all proper licensing requirements be met, such as Commercial Drivers License (CDL), prior to any personnel operating any referenced equipment. A licenced operator must:

    a. Know, understand, and demonstrate the working limits and safe operation of the equipment, including any attachments.

    b. Must be physically, emotionally, and mentally fit.

    c. Must know and comply with the safety rules and attend at a minimum at least one "Toolbox Safety Meeting" per week.

    d. Must have read and understood the manufacturer's operating instructions for the equipment they are operating.

e. Must be qualified and checked out on the specific equipment they will be operating.

2. The operator is personally responsible for the safe operation/movement of the PCS equipment they are assigned to.

3. All operators on any PCS job-site shall utilize appropriate Personal Protective Equipment (PPE) as referenced in Section 2.3.

4. All Heavy Equipment must be inspected and serviced by a PCS authorized and qualified mechanic on a pre-determined schedule. Such inspections shall be documented. A sample “Daily Checklist” is included on page ? of this section for reference.

5. In the course of a work shift, it will be the operator’s responsibility to report any suspected unsafe conditions that arise with the equipment or at the job-site itself as.

6. Upon notification to a PCS representative, and after verification, any equipment found to be unsafe to operate will be taken out of service and repaired.

7. All cab glass shall be safety glass, or the equivalent, and be of a quality without distortion.

8. Smaller vehicles such as pick-ups and maintenance trucks must be equipped with strobe/beacon lights to enhance visibility around equipment.

9. The use of seat belts is mandatory while operating equipment or riding in vehicles.

10. Vehicles used to transport employees must have seats firmly secured and adequate for the number of employees to be carried.

11. All equipment and heavy-duty vehicles must be equipped with a Reverse Signal Alarm distinguishable from the surrounding noise level. Ambient noise sensing, variable, volume alarms may be required for night operations.

12. Trucks with limited visibility must have a spotter or video device to allow the vehicle operator to ensure that no workers are present in the area behind the vehicle when performing a "backup" operation.

13. When parked on an incline where there is no curb or berm, the wheels shall be chocked (or blades or dump bodies lowered).

14. Operators are required to climb up and down from the equipment using the proper steps/handholds.

15. No person other than the operator shall ride on equipment or in a vehicle that is not specifically designed to carry passengers.

16. No employee shall be allowed to ride in or work from an end-loader bucket.

17. Equipment is not to be moved until the operator is sure that all individuals are clear of the equipment.

18. Equipment operated near energized power lines must follow the guidelines in WAC 296-155-428 (1) (E). All power lines shall be considered energized until PCS supervision has verified that they are de-energized.

19. All vehicles must have a "Service Brake System" capable of stopping and holding the equipment when fully loaded. This may include an Emergency Brake System, and/or a Parking Brake System.

20. Equipment must not be loaded beyond its rated capacities, and all loads must be secured to prevent shifting or loss.

21. When “breaker point”, brush cutting, or other specialty attachments are utilized the PCS procedures always follow the manufacturer’s recommendations for cab/operator protection. Manufacturer’s safety precautions shall be incorporated in the JHA.

22. No persons or PCS personnel shall be permitted to remain in equipment that is being loaded by excavating equipment, unless the cab is adequately protected against heavy impact.

23. PCS operators are required to be familiar with procedures regarding hazards associated with “quick release” bucket mechanisms. Note: A positive locking pin must be utilized to prevent accidental release if so equipped.

E. Maintenance, Repair, & Fueling:

1. All equipment and vehicles in use must be inspected at the beginning of each shift to assure that equipment and accessories are in safe operating condition and free of apparent damage that could cause failure. Items to be checked shall include, but are not limited to:

    a. Operating Controls

    b. Brakes

    c. Windshields and Wipers

    d. Reverse Alarm

    e. Horn

    f. Steering Mechanism

    g. Lights

    h. Steps and Handholds

    i. Hydraulic Hoses

j. Fire Extinguisher

2. Heavy equipment or vehicles which are suspended or held aloft by the use of slings, hoists, or jacks must be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Likewise, bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment must also be either fully lowered or blocked when being repaired or not in use.

3. Equipment being repaired or adjusted is to have the key removed and a tag-out device placed on the control panel.

4. Only PCS maintenance persons, trained in the operation of equipment are allowed to move such equipment.

5. Equipment with obvious hydraulic, coolant, or oil leaks must be promptly repaired.

6. Fuel storage and maintenance areas must be kept clean and free of debris and spilled material. Oily and greasy rags must be properly stored.

7. Proper Fire Protection, Flammable Liquid Storage, and Cutting and Welding procedures are to be followed at all times.

8. Gasoline powered engines must be shut off to refuel!

9. No smoking or ignition sources shall be allowed within 35 feet of a fueling operation.

F. Site Control:

1. Yield the right-of-way to all equipment!

2. All visitors to the site are required to check in with the appropriate PCS supervision.

3. Haul Routes must be built in accordance with WAC standards. Turnouts, emergency ramps, and berms must be provided where needed.

4. Haul Routes must also be properly maintained to prevent injury to employees and damage to equipment.

5. Where Haul Routes criss-cross established roads or other Haul Routes, flaggers or warning signs must be posted.

6. Berms or barricades must be provided and maintained on roadways where drop-offs of sufficient grade or depth exist. Berms or barricades must be at least mid-axle height of the largest equipment that travels the respective roadway.

7. Equipment speeds must be maintained at the appropriate site and weather conditions, should pre-set speed limits are not posted.

8. All equipment left unattended at night adjacent to a roadway that is in normal use, or adjacent to a construction areas where work is in progress, must be barricaded in conformance with the Uniform Traffic Code.

9. Everyone on ground level, working around moving equipment shall wear high visibility vests or garments.

10. Employees needing to drive through or within an area where Heavy Equipment is in operation, must stop and observe the physical layout and equipment movement long enough to become familiar with the activity, prior to entering the site.

11. Employees who have driven inside an area where Heavy Equipment is in operation, must be aware that material can come off of the top of any Haul units, especially when they proceeding to make a turn, and be prepared to act accordingly.

G. Compaction Testing in Active Earthwork Fills:

1. PCS requires any technicians working among active earthmoving equipment must utilize proper PPE including hard hats, high-visibility vest, and appropriate footwear.

2. All technicians will be required to communicate with the Grading Supervisor to determine when fill areas are ready for testing, and the best routes for entering and leaving the fill area.

3. In large fills, if at all possible, tests should be performed at a safe distance from equipment traffic. Technicians must enter the fill areas by traveling with the flow of the equipment traffic, and take all prudent steps to avoid unsafe situations.

4. Technicians must make contact with equipment operators and must not proceed into the paths of equipment, unless the operator has given them a positive hand signal to do so.

5. Technicians and grading supervision must maintain constant communication to ensure test pits are located and quantified in accordance with project requirements for testing.

6. Technicians should place their vehicles at the open end of the test pit, place a signal flag in the spoil pile at the closed end while keeping their strobe/beacon light “on” at all times while in the fill.

7. When leaving the test pit, technicians should check the immediate surroundings to ensure no obstacles are in the way of making a safe vehicle exit. If such obstacles are present, they must promptly inform the PCS grading supervisor of the situation and remain at the test pit until it is safe to exit.

8. Technicians shall leave the fill by traveling with the flow of the equipment traffic.

H. Public Safety:

1. PCS requires that no Heavy Construction Equipment or vehicles be moved to access any roadway or grade, unless the access roadway or grade is constructed and

maintained to accommodate safely, the movement of the specified equipment or vehicles involved.

2. Where trucks enter public highways, or cross-established routes, warning signs or flaggers must be posted to alert the traveling public.

3. Equipment operated on public roads shall be equipped with functioning lights, overhead beacon or strobe, and a slow moving vehicle placard. In addition, equipment must be escorted by a vehicle licensed for public roads when traveling from one location to another.

4. Before vehicles exit any PCS project site, they must have had all loose or excess material removed.

5. All roadways used by the traveling public must be kept clear of spilled material.

6. Drivers must obey all posted speed limits and operate their vehicles in accordance with road/weather conditions.

7. Loads in or on vehicles shall be secured or covered in regards to RCW 46.61.655.

Daily Equipment Safety Inspection

	OK	*N/A*	*REPAIR*
Operating Controls			
Brakes			
Seat / Seat Belts			
Tires / Wheels			
Windshield / Wipers			
Lights			
Reverse Alarm			
Horn			
ROPS Canopy			
Fenders / Flaps			
Steering Mechanism			
Fire Extinguisher			
Hydraulic Hoses			
Steps / Handholds			

Equipment #: _____

Operator: _____

Date/Shift: _____

2.14 EXCAVATION & TRENCHING

A. Scope:

This section defines minimum safety requirements for all open excavations made in the earth's surface located on any PCS job-site. Excavations are defined to include trenches.

B. Purpose:

To ensure that methods of protecting employees against cave-ins and to facilitate Safe Work Practices for employees during Excavation & Trenching operations prior to commencing work projects. All PCS employees involved in Excavating & Trenching activities, including those utilizing Heavy Equipment, are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: OSHA - 29 CFR Subparts P & S,

Washington State: WAC 296-155 Parts N & Q,

Sections 2.18 Earthwork Activities and Section 3.1 Confined Space Entry of this manual.

D. Definitions:

1. ***Accepted Engineering Practices*** – Requirements that are compatible with standards of practice required by a Professional Engineer.

2. ***Aluminum Hydraulic Shoring*** – Pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross-braces) used in conjunction with vertical rails (uprights) or horizontal rails (walers), designed specifically to support the side-walls of an excavation and prevent cave-ins.

3. ***Bell Bottom Pier Hole*** – Type of shaft or footing excavation, the bottom of which is made larger than the cross-section above to form a bell shape.

4. ***Benching (Benching System)*** – 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.

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

6. ***Competent Person*** - A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, who has the authorization to take prompt corrective measures to eliminate them and is knowledgeable of WAC 296-155-650.

7. ***Cross Braces*** – Horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

8. ***Excavation*** – Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal.

9. ***Faces or Sides*** – The vertical or inclined earth surfaces formed as a result of excavation work.

10. ***Failure*** – Breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and support capabilities.

11. ***Hazardous Atmosphere*** – Atmosphere which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness, or injury.

12. ***Kick-Out*** – The accidental release or failure of a cross-brace.

13. ***Protective System*** – A method of protecting employees from cave-ins, from material that could fail or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support or shield systems that provide necessary protection.

14. ***Qualified Person*** - One who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, work, or project.

15. ***Ramp*** – Inclined walking or working surface that is used to gain access to one point from another, constructed from earth or structural materials such as steel or wood.

16. ***Sheeting*** – Large surface area members used to retain soil supported by structural members of a shoring system.

17. ***Shield (Shield System)*** – A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or be designed to be portable and moved along as work progresses. Additionally, they can be either pre-manufactured or job built in accordance with 29 CFR Part 1926-652. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

18. ***Shoring (Shoring System)*** – A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and is designed to prevent cave-ins.

19. ***Sloping (Sloping System)*** – A method of protecting employees from cave-ins by excavating to form sides that are inclined away from the excavation. The angle of incline required to prevent a cave-in varies depending on the differences in such factors as soil type, environment conditions and application of surcharge loads.

20. ***Stable Rock*** – Natural, solid, mineral material that can be excavated with vertical sides and remains intact while exposed. Unstable rock is considered to be stable when the rock minerals on the side(s) of the excavation is secured against caving in or movement by rock bolts, or by a protective system that was designed by a Registered Professional Engineer.

21. ***Structural Ramp*** – A ramp built of steel or wood, usually for vehicle access. Ramps made of soil or rock are not considered structural ramps.

22. ***Support System*** – A structure such as underpinning, bracing, or shoring that provides support to an adjacent structure, underground installation, or the sides of an excavation.

23. ***Tabulated Data*** – Tables and charts approved by a Professional Engineer and used to design and construct a protective system.

24. ***Trench*** – A narrow excavation in relation to its length made below the surface of the ground. In general, the depth is greater than the width, but the width (measured at the bottom) is not greater than 15 feet (4.6m) (measured at the bottom of the excavation).

25. ***Uprights*** – The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed in such a way that individual members are closely spaced; in contact with, or inter-connected to each other are often called "sheeting".

26. ***Waler*** – Horizontal members of a shoring system placed parallel to the excavation face and whose side bears against the vertical members of the shoring system or earth.

E. General Requirements:

1. Surface encumbrances that are located so as to create a hazard to employees must be removed or supported.

2. Underground installations such as sewer, telephone, fuel, electric; water lines or any other installations that reasonably may be expected to be encountered during excavation shall have their location determined prior to opening an excavation/trench.

3. When underground utility lines are being located, "hand digging" in these locations must be required. While the excavation/trench is open, underground lines must be protected, supported, or removed as necessary to safeguard employees and the utilities.

4. Employees in an excavation/trench must be protected from cave-ins by proper sloping, benching or an adequate protective system.

5. Pits or excavations with vertical drops that expose employees to fall hazards over 6 foot must be guarded by warning lines, standard guard rails or personal fall protection systems.

6. Access and egress from excavation/trenches such as a stairway, ladder, ramp or other safe means must be located in excavations/trenches so as to require no more than 25 feet of lateral travel for employees.

7. Employees exposed to vehicular traffic must wear high visibility vests or garments.

8. No employee shall be permitted underneath loads handled by lifting or digging equipment. No worker will be permitted to remain inside any equipment that is being loaded, unless the cab is adequately protected against heavy impact.

9. Where the stability of adjoining buildings, walls, or other structures may be endangered by excavation/trench operations, an engineered support system such as shoring, bracing, or underpinning must be provided to ensure the stability of such structures for the protection of employees.

10. Adequate protection must be provided 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 and stockpiling excavated materials at least 2 foot back from the excavation.

11. Warning systems such as warning lines, guardrails, barricades, hole covers, signals, or signs must be utilized around trenches and excavations.

12. If the excavation is exposed to vehicle or equipment traffic, berms or barricades must be provided and maintained that will divert or stop vehicles or equipment from driving into the excavation. Berm or barricade height shall be at least mid-axle of the largest equipment.

13. Walkways must be provided where employees are required or permitted to cross over excavations. Standard guardrails must be provided on walkways where the depth is 4 foot or greater. Ramps must comply with WAC 296-155-505 and 296-155-515.

14. Upon completion of exploration and similar operations, temporary excavations, and shafts must be back-filled.

15. Employees are advised not work in excavations where there is accumulated water or in excavations where water is accumulating, unless adequate precautions have been taken to protect against hazards posed by water accumulations.

16. Employees are advised not enter bell-bottom pier holes, caissons, shafts or other similar deep and confined footing excavations, unless a protective system/sleeve is in place.

F. Competent Person by Definition:

1. Per Section 1.2.2, Contractor Safety Responsibilities & Requirements, the Competent Person shall be identified by name in the PCS Safety Program.

2. The Competent Person must meet the definition set forth by OSHA.

3. A Competent Person shall be located on each project job-site and be capable of classifying soils.

4. The Competent Person must, as a minimum, perform and document daily inspections of the excavation, along with additional inspections as required due to changing conditions.

5. The Competent Person shall be present at the excavation during periods of accumulated water or when dewatering equipment is in use.

6. The Competent Person shall take appropriate action as site conditions dictate.

G. Inspections:

1. Daily inspections of excavations, adjacent areas, protective systems, and surface encumbrances must be performed by the 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.

2. Inspections must be conducted prior to the start of work and as required throughout the shift.

3. Inspections must be performed after every rainstorm or as required by changing site conditions.

4. If conditions exist or are suspected to exist where the results could result in a:

   a. possible cave-in,

   b. failure of protective systems,

   c. 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.

5. All inspections shall be documented using the initial assessment and daily inspection forms located on your daily work schedule".

H. Confined Space Entry:

1. Excavations, pits, and trenches may be classified as confined spaces. PCS' Competent Person will be in charge to make that determination. PCS procedures for Confined Space Entry can be found in Section 3.1 of this manual.

2. Emergency Rescue Equipment such as breathing apparatus, safety harness, lines, and basket stretcher must be readily available where hazardous atmospheric conditions exist and/or may reasonably be expected to develop during work in an excavation.

3. Where oxygen deficiency (atmospheres containing less than 19.5% 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 atmosphere in the excavation must be pre-tested before employees enter excavations.

I. Protective Systems Requirements:

1. All employees in an excavation must be protected from cave-ins by proper sloping, benching, shoring or an adequate protective system designed in accordance with sloping and benching configurations. Exceptions are:

    a. Excavations/trenches are made entirely in stable rock.

    b. Excavations/trenches are less than 4 feet in depth, and examination of the ground by the Competent Person provides no indication of a potential cave-in.

2. Protective systems must 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.

3. Tabulated Data for such systems shall bear the stamp of a PCS Qualified Professional Engineer, and be located at the job-site with all other pertinent, required documents.

4. A PCS qualified staff member, or designation outside Professional Engineer shall design excavations or shoring systems that will be located at 20 feet or more below grade.

J. Materials and Equipment:

1. Materials and equipment used for protective systems must be free from damage or defects that may impair proper function.

2. Manufactured materials and equipment used for protective systems must be used and maintained consistent with manufacturer recommendations.

3. When material or equipment that is used for protective systems is damaged, the Competent Person must examine the material or equipment and evaluate its suitability for continued use.

K. Installation and Removal of Support:

1. Members of support systems must be securely connected together to prevent sliding, failing, kick-outs, or other predictable failure.

2. Support systems must 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.

3. Removal must begin and progress from the bottom of the excavation. Support members must be released slowly, so as to note any indication of possible failure of the remaining support members, or any possible cave-ins or the sides within the

excavation. Back filling of the excavation must progress together with the removal of the support systems.

L. Additional Requirements for Support Systems:

1. Excavation of material to a level no greater than two feet below the bottom of the support members of any support system will be permitted, but only if the system is designed to resist forces calculated for the full depth of the trench, and there is no indication while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

2. When placed in an excavation, the top of the shield should extend 18" above the slope of the excavation to prevent material from rolling into the shield.

3. Employees are not to 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 hazards of falling material(s).

4. Shield systems are not be subjected to loads exceeding those that the system was designed to withstand.

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

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

2.15 EXCAVATION & TRENCHING - Appendix A, Soil Classification

A. Scope:

This section describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The rule contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soil.

All PCS employees involved in Excavating & Trenching activities, including those utilizing Heavy Equipment, are required to also be familiar with Soil Classification guidelines as noted below.

B. Definitions:

1. ***Cemented Soil*** – A soil in which particles are held together by a chemical agent, such that a hand-size sample cannot be crushed into a powder or individual soil particles by finger pressure.

2. ***Cohesive Soil*** – Clay (fine-grained) or soil with a high clay content and that has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical slide slopes, and has plasticity when moist.

3. ***Confined Compressive Strength*** – The load per unit area at which a soil will fail in compression.

4. ***Dry Soil*** – Soil that does not exhibit visible signs of moisture content.

5. ***Fissured*** – Soil material that has a tendency to break along definite planes of fracture with little resistance.

6. ***Granular Soil*** – Gravel, sand, or silt (coarse gravel soil) with little or no clay content, and no cohesive strength.

7. ***Layered System*** – Two or more distinctly different soil or rock types arranged in layers.

8. ***Moist Soil*** – A condition where a soil looks and feels damp.

9. ***Plasticity*** – A property of a soil that allows the soil to be deformed or molded without cracking or experiencing appreciable volume change.

10. ***Saturated Soil*** – A soil in which the voids are filled with water. Saturation does not require flow.

11. ***Stable Rock*** – Natural solid mineral that can be excavated with vertical sides and remains intact while exposed.

12. ***Submerged Soil*** – Soil that is underwater or is free seeping.

13. ***Wet Soil*** – Soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated; granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

C. Soil Classification - General Information:

1. Each soil and rock deposit shall be classified by a Competent Person as Stable Rock, Type A, Type B, or Type C in accordance with the standard.

2. The classification of the deposits shall be made based on the results of at least on visual and at least one manual analysis. Such analysis shall be conducted by the Competent Person using recognized forms of testing.

3. Visual and manual analysis shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to properly identify the properties, factors, and conditions affecting the classification.

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

D. Acceptable Visual and Manual Tests:

1. Observe soils that are have been excavated. Fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

2. Observe soil as it is being excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

3. Observe the side of the opened excavation. Crack-like openings could indicate fissured material.

4. Observe the side of the excavation to identify a layered system.

5. Observe the area adjacent to the excavation for surface encumbrances to identify previously disturbed soil.

6. Observe the area adjacent to the excavation and side of the excavation for evidence of surface water or seeping water and evidence of the water table level.

7. Observe the adjacent area for any signs of vibration.

E. Manual Tests:

1. ***Plasticity.*** Mold a moist or wet sample of soil into a ball and attempt to roll it into threads. Cohesive material can be successfully rolled into threads without crumbling.

2. ***Dry Strength.*** If the soil is dry and crumbles on its own or with moderate pressure into individual grains or powder, it is granular. If the soil is dry and falls

into clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in combination with gravel, sand or silt.

3. ***Thumb Test***. Take a soil sample and press upon it with your thumb and note the following:

4. ***Type A:*** Cohesive soil with an unconfined compressive strength of 1.5 ton per square foot or greater. The soil can be easily indented by the thumb; however, it can be penetrated by the thumb only with very great effort. Examples of cohesive soils are: clay, silty clay, sandy clay, and clay loam. Cemented soils such as caliche and hardpan are also considered Type A. No soil is Type A if it is fissured or subject to heavy vibration from heavy traffic, pile driving, or similar effects; or the material is subject to other factors that would require it to be classified as a less stable material.

5. ***Type B:*** Cohesive soil with an unconfined compressive strength greater than 0.5 ton per square foot but less than 1.5 ton per square foot. Type B soil would include previously disturbed soil or those subject to vibration.

6. ***Type C:*** Cohesive soil with an unconfined compressive strength of 0.5 ton per square foot or less. Type C soil can easily be penetrated several inches by the thumb. Examples of this soil would be granular such as sand, gravel, submerged rock or soil from which water is freely seeping.

2.16 EXCAVATION & TRENCHING - Appendix B, Sloping and Benching

A. Scope:

This section contains specifications for sloping and benching when used as methods of protecting employees working on excavations from cave-ins.

All PCS employees involved in Excavating & Trenching activities, including those utilizing Heavy Equipment, are required to also be familiar with Sloping & Benching guidelines as noted below.

B. Requirements:

1. Stable Rock is the only allowable classification that allows for vertical walls.

2. The maximum allowable slope for Type A soil in an excavation less than 20 ft is 3/4:1.

3. The maximum allowable slope in Type B soil in an excavation that is less than 20 ft is 1:1.

4. The maximum allowable slope in Type C soil in an excavation less than 20 ft is 11/2:1 than 20 ft is 11/2:1.

5. Type A and Type B soils can be benched with a maximum allowable bench dimension of 4 ft. Type C soil cannot be benched.

   NOTE: For other sloping and benching configurations, please consult the OSHA or WISHA regulations.

2.17 – ELECTRICAL SAFETY

A. Scope:

This section defines the minimum safety requirements for low voltage electrical work on the PCS construction projects.

B. Purpose:

The purpose of this program is to ensure the proper use, maintenance, and inspection of electrical equipment and cords to minimize potential injuries due to electrical shock. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: OSHA - 29 CFR 1926 Subpart K,

Washington State: WAC 296-155 Part I. NEC, WAC 800-280,

Section 3.3 - Lock-out/Tag-out & Section 3.5 - Energized Electrical of this manual

D. Definitions:

1. ***Accessible. (As applied to wiring methods.)*** Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

2. ***Accessible. (As applied to equipment.)*** Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

3. ***Appliances.*** Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

4. ***Approved.*** Approved by the director of the department of labor and industries or his/her authorized representative: Provided, however, that should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories, the Bureau of Mines, or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) the provisions of WAC 296-155-006 shall apply.

5. ***Attachment plug (plug cap) (cap).*** A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

6. ***Automatic.*** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

7. ***Bonding.*** The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

8. ***Bonding jumper.*** A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

9. ***Branch circuits.*** That portion of a wiring system extending beyond the final over current device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the over-current device protecting the circuit.)

10. ***Circuit breaker***.

    a. (600 volts nominal, or less.) A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined over-current without injury to itself when properly applied within its rating.

    b. (Over 600 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

11. ***Concealed.*** Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

12. Conductor.

    a. ***Bare.*** A conductor having no covering or electrical insulation whatsoever.

    b. ***Covered.*** A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

    c. ***Insulated.*** A conductor encased within material of composition and thickness that is recognized as electrical insulation.

13. ***Dead front.*** Without live parts exposed to a person on the operating side of the equipment.

14. ***Device.*** A unit of an electrical system which is intended to carry but not utilize electric energy.

15. ***Disconnecting (or isolating) switch.*** (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

16. ***Electrical Outlets.*** Places on an electric circuit where power is supplied to equipment through receptacles, sockets and outlets for attachment plugs.

17. ***Enclosed.*** Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

18. ***Enclosure.*** The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

19. ***Equipment.*** A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

20. ***Exposed.*** (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

21. ***Feeder.*** All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit over-current device.

22. ***Fuse.*** (Over 600 volts, nominal.) An over-current protective device with a circuit opening fusible part that is heated and severed by the passage of over-current through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

23. ***Ground.*** A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

24. ***Ground-fault circuit interrupter.*** A device for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the over-current protective device of the supply circuit.

25. ***Guarded.*** Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

26. ***Isolated.*** Not readily accessible to persons unless special means for access are used.

27. ***J-Box (junction box).*** An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

28. ***Labeled.*** Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

29. ***Lighting outlet.*** An outlet intended for the direct connection of a lamp-holder, a lighting fixture, or a pendant cord terminating in a lamp-holder.

30. ***Listed.*** Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

31. ***Motor control center.*** An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

32. ***Over-current.*** Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for over-current protection are specific for particular situations.

33. ***Panel-board.*** A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic over-current devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

34. ***Power outlet.*** An enclosed assembly which may include receptacles, circuit breakers, fuse-holders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

35. ***Qualified person.*** One familiar with the construction and operation of the equipment and the hazards involved.

36. ***Receptacles.*** Outlets that accept a plug to supply electric power to equipment through a cord or cable.

37. ***Readily accessible.*** Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

38. ***Receptacle.*** A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

39. ***Service.*** The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

40. ***Service conductors.*** The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

41. ***Switchboard.*** A large single panel, frame, or assembly of panels which have switches, buses, instruments, over-current and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panel-board.")

42. ***Switching devices.*** (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

43. ***Transformer.*** A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

44. ***Voltage.*** (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

45. ***Weatherproof.*** So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, rain-tight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

E. Protection of Employees

1. PCS employees are not permitted to work in such proximity to any part of an electric power circuit, so that the employee could contact the electric power circuit in the course of their work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

2. Access into electrical substations, rooms, cabinets, vaults, and manholes is restricted to PCS Designated and Qualified Persons only, unless the equipment is de-energized or a Qualified Person is in supervision of the unqualified personnel making access.

3. Only PCS Qualified Persons may work on electric circuit or parts of equipment that have not been de-energized under the procedures of WAC 296-155-429(4). Such persons must possess necessary skills and be capable of working safely on energized circuits, They must also be familiar with the proper use of special precautionary techniques, Personal Protective Equipment, insulating and shielding materials, and insulated tools.

   NOTE: For work to be performed on energized systems, a "Compelling Reason" must be documented in writing. Procedures and Energized Electrical Work Permit (EEWP) can be found in Section 3.7 of this manual.

4. PCS employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employee to perform the work safely.

5. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) are not be worn in areas where they might contact exposed energized parts

6. Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

7. Only a PCS Qualified Person may defeat an electrical safety interlock, and then only temporarily while they are working on specific equipment or making repairs. The interlock systems must be returned to its operable condition when this work is completed.

F. Working Near Energized Electrical Lines:

1. 1. Before work begins, a PCS Qualified Person must ascertain whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit.

2. A PCS Qualified Person must post and maintain proper warning signs where such an areas exists. This Qualified Person will advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

3. In work areas where the exact location of underground electric power lines is unknown, no activity that may possibly bring employees into contact with potentially exposed power lines can begin until the location of the power lines has been positively identified.

4. PCS employees are not authorized to perform any work in proximity to electrical conductors or engage in any excavation, construction, demolition, repair, or other operation, where danger from accidental contact with said electrical conductors shows to be hazardous. Only when such conditions have been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means. may employees continue work.

5. No work shall be performed; no material shall be piled, stored or otherwise handled; no scaffolding, commercial signs, or structures shall be erected or dismantled; nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected. To prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

    a. For lines rated 50 kV or below: Minimum clearance between the lines and any part of the equipment or load shall be ten feet.

    b. For lines rated over 50 kV: Minimum clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV over 50 kV, or twice the length of the line insulator, but never less than ten feet.

G. Ground Fault Circuit Interrupters:

1. A Ground Fault Circuit Interrupter (GFCI) is required whenever plugging into any power source.

2. A PCS Qualified Person will be responsible for the inspection and maintenance of any GFCI systems. Documented inspections will be performed monthly, or more frequent as conditions dictate.

3. All temporary power supplied by the PCS will utilize a GFCI system.

   NOTE: Surge Protectors do not function the same as a GFCI. Most surge protectors will continue to function as a power strip even after the surge mechanism fails due to previous surges. This presents two possible dangers: Subsequent surges could damage electrical equipment; and/or, if sufficient voltage passes through the surge protector due to a second power spike, a resistant short may occur, allowing overheating and a fire to ignite.

H. Cords and Cables:

1. A PCS Qualified Person is responsible to visually conduct inspections of cord sets and equipment connected by cord and plug before each day's use for external defects, such as deformed or missing ground pins, or insulation damage, and for indication of possible internal damage.

   a. Make sure flexible cords and electrical cords are:

      i. Connected to devices and fittings (plug ends) so that any pulling force on the cord is prevented from being directly transmitted to joints or terminal screws on the plug

      ii. Used only in continuous lengths without splice or tap

2. Equipment found to be damaged or defective must not be used and must immediately be tagged and removed from service and repaired by a Qualified Person.

3. A PCS Qualified Person has the responsibility to maintain a cord management program that addresses:

   a. Electrical cords running through access ways in a manner not to create trip and fall hazards; being run over by equipment;

   b. Cords being placed over sharp objects or subject to pinch points or other areas they may be damaged;

   c. Cords being picked up on a daily basis.

4. Employee's hands must not be wet when plugging and unplugging flexible cords and cord and plug connected equipment.

5. Extension cords or temporary lighting must not be fastened with staples, hung from nails, or suspended by wire.

6. Power tools and portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment must not be used for raising or lowering the equipment.

7. Cords passing through holes in covers, outlet boxes or similar enclosures must be protected by bushings or fittings.

8. Cords must not be run through holes in walls, ceilings, or floors or where unknown items may be concealed by walls, ceilings or floors.

9. Cords may pass through doorways or other pinch points, only if protection is provided on the cord to avoid damage.

I. Housekeeping:

1. Where live electrical parts may present an electrical contact hazard, employees must void performing 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.

2. Electrically conductive cleaning materials (including conductive solids such as steel wool, metallic cloth, and silicon carbide, as well as conductive liquid solutions) must not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

J. Lighting & Illumination

1. Adequate lighting will be provided throughout all building and in all work areas throughout any job-site project, particularly in passageways and stairways, and wherever it is necessary to avoid a hazard due to a lack of light.

2. The minimum level of task lighting for all indoor activities must be an average of 10 foot candles measured 30 inches above the floor or the task.

3. The minimum level of task lighting for all outdoor activities must be an average of five foot candles measured 30 inches above the floor or the task

4. Areas requiring the continuous use of temporary lighting are to be inspected regularly and defective lamps replaced.

5. Temporary lighting must be equipped with guards to prevent accidental contact and breakage of bulbs.

6. In addition to providing the required illumination intensities, consideration should be given to the selection and placement of lights so as to provide minimum glare, eliminate harsh shadows and provide adequate illumination to work effectively.

7. Empty exposed light sockets must be plugged and broken bulbs either replaced or removed and replaced with safe plugs.

8. High intensity task lighting must not be left on after the work shifts have concluded.

Lighting Table

Activity	*Minimum acceptable average lighting level in an area: (Foot-candles)*	*Any one single measurement used to determine the average lighting level* cannot be less than: (Foot-candles)*
Indoor task	*10*	*5*
Outdoor task	*5*	*2.5*
Nontask activities for both indoor and outdoor	*3*	*1.5*
** Lighting levels must be measured at thirty inches above the floor/working surface at the task.*		

2.18 – TOOLS HAND & POWER

A. Scope:

This section defines the minimum safety requirements for use of hand, power and powder actuated tools on any PCS job-site projects.

B. Purpose:

To minimize hazards to employees due to improper use, or use of worn or damaged tools. All PCS employees are required to be familiar with the guidelines of this Section as noted below.

C. Reference:

Refer: OSHA - 29 CFR 1926 Subparts I & Q,

Washington State: WAC 296-155 Parts G & O, WAC 296-800-280.

D. General

1. All hand and power tools and similar equipment furnished by PCS shall be maintained in a safe condition.

2. PCS employees are not permitted the use of unsafe tools. Any tools in such a condition must be removed from service, tagged, and and/or repaired.

3. When tools are designed to accommodate guards, they must be equipped with such guards for maintenance purposes. Guards must never be removed or rendered inoperable.

4. Reciprocating, rotating or moving parts of equipment or tools that present either in-line nip point or pinch point hazards, shall be guarded to prevent employee from contacting dangerous moving parts.

5. Equipment that can be electrically driven, in place of gas or diesel, are is preferred.

6. All fuel-operated (diesel, gasoline) generators are to be located outside of buildings.

7. Fuel powered equipment placed outside of a building must not be staged where the exhaust can be captured by air handling equipment or enter back into adjacent building by proximity or other means.

8. The use of Liquid Propane (LP), below grade, is prohibited by the PCS and the local Fire Department. Authorization to use LP Gas, below grade, requires a permit from the governing local Fire Department in writing. Requests to use such fuels must first receive approval from a PCS Supervisor, who, if they approve, are then the only authorized person to submit such a request.

9. LP equipment (Propane) is Carbon Monoxide (CO) producing. When CO producing equipment is utilized "indoors" the appropriate PCS designated employee must have a plan in place to monitor and mitigate any hazards to workers in the vicinity.

E. Hand Tools:

1. Impact tools must be kept free of mushroomed heads. used an job-sites, and wrapped tape is not an acceptable condition.

F. Power-Operated Hand Tools:

1. All hand-held power tools shall be equipped with the appropriate positive "on-off", momentary contact or constant pressure switch in good working order.
2. Electric power-operated tools shall be double insulated or grounded.
3. Electrical cords on tools shall not be used to hoist or lower such equipment.
4. Cords shall be kept free of knick and cuts to the insulation.

G. Powder Actuated Tools:

1. Only persons trained and authorized by a qualified person may operate any tool.
2. A lockable container must be provided for each tool.
3. Signage must be posted and maintained in plain sight where tools are used.
4. Loaded tools must not be left unattended.
5. Proper hearing, eye, and face protection must be utilized.
6. Tools must be inspected prior to use per manufacturer's instructions.
7. Unused or misfired loads must be properly disposed of.

H. Pneumatic Tools:

1. Quick disconnect couplings or by 100lb. tensile strength safety chain or equivalent across each connection to prevent the tool or hose connection from becoming accidentally disconnected.
    a. Chicago couplings must be pinned at the coupling(s).
    b. Whip checks must be used at all hose-to-hose, hose-to-tool and compressor-to-hose connections.
2. Pneumatic hand tools must be disconnected from the power source and pressure bled from hose prior to any adjustments or repairs to the tools.
3. Air hoses located on roadways must be protected to prevent vehicular damage.

4. Compressed air must not be used at the nozzle for cleaning purposes, except where pressure can be reduced to less than 30 p.s.i.

I. Masonry Saws…

1. Saws must be guarded by a semicircular enclosure over the blade.

2. All table mounted saws must be equipped with a mechanical means of exhausting dust into a covered receptacle or be provided with water on the saw blade to control dust.

3. The motor frames of all stationary saws must be grounded through conduit, water pipe, or a driven ground. Portable saws must be guarded through a grounded electrical system and GFCI.

J. Come-A-Longs & Chain Falls…

1. Damaged equipment must not be used. Safety latches must be maintained in working order or replaced.

2. A pick exceeding 75% of the rated capacity of the hoisting device is considered "Critical". A PCS Representative must be consulted before any work is performed with this equipment.

2.19 – PUBLIC HAZARD CONTROL

A. Scope:

This section defines minimum requirements for the protection of the general public subject to hazards arising from any PCS operations, connected with the construction, maintenance and repair, and/or demolition of structures in the vicinity there of.

B. Purpose:

To evaluate and prevent or reduce to a minimum injury to persons or their property while assessing any PCS job-site. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: ANSI/ASSI: A10.34-2001. - Protection of the Public or Adjacent Construction Sites

D. General Requirements:

1. PCS, with respect to each job-site, develops a Public Hazard Control Plan which each related PCS employee is expected to follow. Employees must contact their job-site supervisor to receive a review copy.

2. The purpose of this Plan is to ensure the safety of passengers, tenants, employees, suppliers or vendors, traveling onto PCS projects, related roadways, sidewalks, or any area accessed by the public where work is being performed. All operations taking place above or adjacent to vehicular, pedestrian, or air traffic areas is also addressed by this Plan.

3. One appointed PCS employee (company agent) will have the authority to act on behalf of the PCS and will be available, on call, twenty-four hours a day, throughout the duration of their respective project. Appropriate methods for contacting this PCS representative will be made available to all PCS employees.

4. PCS is responsible for the placement and maintenance of all devices and signage required for the protection of the public.

5. PCS personnel will perform daily inspections of the work to ensure their plan is fully implemented and operational. All inspections shall be documented.

6. All necessary measures will be taken to prevent any materials from migrating from the work site into areas occupied by the public. This includes, but is not limited to dust, mud track-out, debris, construction materials, liquids, mists, vapors, and fumes.

7. Barricades shall be provided to delineate the work area from areas used by the public. The barricades shall be suitable for the hazardous locations and are to be constructed in accordance with the required Codes or Policies.

8. Dust, vapor, fume, and smoke-proof enclosures to separate the work area from the central HVAC and public (whenever welding, dust, vapor, or fume generating activities take place) are to be set up accordingly.

9. Daily inspections are to be made to ensure PCS' plan(S) is/are fully implemented and operational. All inspections will be documented with the main construction office.

10. In the event an accident occurs involving the public, PCS will immediately implement any and all required appropriate action(s) to secure the status of any injured party(s) and seek any appropriate outside assistance. In addition, PCS personnel will attempt to ascertain what level of damage may have occurred to the job-site.

11. No statements are to be made to any news media by anyone other than top level PCS management assigned to do so.

E. Hazards to Consider:

1. Traffic Hazards:

   a. As part of PCS' Public Hazard Control Plan, PCS has prepared a traffic control plan.

   b. The Plan is intended to provide warnings, and to protect the public, tenants, and PCS employees from injury or damage caused by the job-site operations.

   c. The Plan signifies that no work is to be performed on or adjacent to any vehicular or pedestrian roadway/walkway until all necessary signage and traffic control devices have been approved and are in place.

2. Pedestrian Hazards:

   a. At all times during construction, areas designated for pedestrian traffic shall be clearly delineated and maintained so that no hazard to the public exists.

   b. Public areas adjacent to the work shall be protected to reduce hazards to pedestrians from falling objects or debris.

   c. Pedestrian barriers and enclosures shall be built to the specifications noted above.

   d. Where pedestrian access is impacted, suitable safe access must be provided. Pathways must also be clearly marked, and lighting provided.

   e. Non-level surfaces shall be delineated with high visibility markings and/or signage to ensure that hazards which may cause slipping, tripping or falling are eliminated or minimized.

f. Stairs, ramps, and elevated walkways must be provided with standard guardrails. Those exposed to weather shall be constructed with non-slip surfaces.

g. Shields must be established around welding, cutting or grinding operations, where those operations may closely interact with Pedestrian Traffic. In addition, welding fumes within similar proximity, will need to be mitigated by the use of high efficiency filtration units such as the Plymo Vent MK 800

3. Illumination:

a. In public areas, the Contractor shall provide temporary lighting to maintain lighting levels present prior to the beginning of work during the duration of operations.

b. All walking surfaces, pathway, stairs, tunnels, ramps, and bridges, and bridge crossings shall be adequately illuminated at all times.

c. All construction lighting shall be directed or shielded so as not to become a hazard to vehicular or pedestrian traffic.

d. Daily inspections of these areas shall be performed.

4. Construction Equipment and Vehicles:

a. Access to all equipment and vehicle operations is be restricted by the use of barricades, fencing, warning signs, or personnel.

b. When equipment or other vehicles must enter or exit the construction site, the public must be warned by the use of electric reader boards, flaggers and traffic control devices.

c. For freedom of movement, a crushed rock roadway, traffic zones at staging areas and site access locations will be established to ensure entrance, staging areas and surrounding roads are free from mud and other debris.

d. Any PCS equipment that is operated on public roadway traffic areas must be equipped with “slow moving vehicle” placards and overhead warning lighting.

e. Loads are not to be hoisted over any active public roadway, sidewalks, or areas utilized by the public.

f. All construction vehicles and equipment on any PCS project operating between 10:00 PM and 7:00 AM shall be equipped with an ambient noise sensing, variable volume reverse alarm system in compliance with WAC 296-155-615.

5. Falling objects and wind blown objects:

    a. Where there is a possibility of objects, tools, construction materials, or debris to fall, be blown, or otherwise be propelled into public areas or onto roadways, barriers, catch platforms, enclosures, debris netting, or implement other administrative or engineering controls are to be set in place.

    b. Controls that are implemented shall be of sufficient strength to prevent public impact.

6. Security:

    a. Designated PCS employees are to provide security and facilities to protect the work and PCS operations from unauthorized entry, vandalism, and theft.

    b. Designated PCS employees are to establish all necessary areas that are to be closed to the public at all times.

    c. For outdoor areas, a 6-foot chain link fence with gates should be provided around the perimeter of the job-site during the entire length of construction.

    d. The 24-hour contact number(s) of the person(s) responsible for security of the work area should be provide to related personnel.

2.20 – MATERIAL HANDLING & STORAGE

A. Scope:

This section defines the minimum requirements for material handling and storage on all PCS projects.

B. Purpose:

To reduce or eliminate the potential of injury to all PCS employees and visitors performing work on any PCS construction project or job-site. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to:
Washington State: WAC 296-155 Part F

D. General Material Storage Safety to be utilized by all respective PCS employees:

1. Make sure that all materials stored in tiers are stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.

2. Post conspicuously the maximum safe load limits of floors within buildings and structures, in pounds per square foot, in all storage areas, except for floor or slab on grade. Do not exceed the maximum safe loads.

3. Keep aisles and passageways clear to provide for the free and safe movement of material handling equipment or employees. Keep these areas in good repair operations.

4. Use ramps, blocking, or grading when a difference in road or working levels exists to ensure the safe movement of vehicles between the two levels.

5. Do not place materials stored inside buildings under construction within 6 feet of any hoist way or inside floor openings, or within 10 feet of an exterior wall which does not extend above the top of the material stored.

6. Segregate non-compatible materials in storage.

7. Stack bagged materials by stepping back the layers and cross-keying the bags at least every ten bags high

8. Do not stack bricks more than 7 ft high. Should a loose brick stack reaches a height of 4 ft, taper it back 2 inches for every foot of height above the 4-foot level

    a. Never stack bricks for storage purposes, on scaffolds or runways.

    b. Always stack blocks; do not throw in a loose pile.

9 When stacking masonry blocks higher than 6 feet, taper back the stack one-half block per tier above the 6-foot level.

a. When stacking inside a building, distribute the piles to prevent overloading the floor.

b. Do not drop or throw blocks from an elevation or deliver blocks through chutes.

10. Do not stack lumber more than 20 feet high; if handling lumber manually, do not stack more than 16 feet high.

a. Remove all nails from used lumber before stacking.

b. Stack lumber on level and solidly supported sills, and such that the stack is stable and self-supporting.

c. Stack stored lumber on timber sills to keep it off the ground. Sills must be placed level on solid supports.

d. Place cross strips in the stacks when they are stacked more than 4 feet high.

11. If not racked, stack and block structural steel, poles, pipe, bar stock, and other cylindrical materials as to prevent spreading or tilting.

a. Wear heavy gloves when handling reinforcing steel.

b. When bending reinforcing steel on the job, use a strong bench set up on even dry ground or a floor to work on.

c. Carefully pile structural steel to prevent danger of members rolling off or the pile toppling over.

d. Keep structural steel in low piles, giving consideration to the sequence of use of its members.

e. Stack corrugated and flat iron in flat piles, with the piles not more than 4 feet high; place spacing strips between each bundle.

13. General Rigging Equipment Safety:

a. Inspect rigging equipment for material handling prior to use on each shift and as necessary during its use to ensure that it is safe. Remove defective rigging equipment from service.

b. Never load rigging equipment in excess of its recommended safe working load.

c. Remove rigging equipment when not in use from the immediate work area so as not to present a hazard to employees.

d. Mark special rigging accessories (i.e., spreader bars, grabs, hooks, clamps, etc.) or other lifting accessories with the rated capacity. Proof test all components to 125% of the rated load prior to the first use. Maintain permanent records on the job-site for all special rigging accessories.

14. Disposal of waste materials:

a. Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, use an enclosed chute of wood or equivalent material.

b. When debris is dropped without the use of chutes, make sure that the area onto which the material is dropped is completely enclosed with barricades at least 42 inches high and 20 feet back from the projected edge of the opening above. Post at each level warning signs of the hazard of falling materials. Do not remove debris in this lower area until debris handling ceases above.

c. Remove all scrap lumber, waste material, and rubbish from the immediate work area as the work progresses.

d. Make sure to comply with local fire regulations if disposing of waste material or debris by burning.

e. Keep all solvent waste, oily rags, and flammable liquids in fire-resistant covered containers until removed from the work site.

3.1 – CONFINED SPACE ENTRY

A. Scope:

This section outlines the minimum safety requirements to be followed while conducting work in a confined space. All PCS employees are required to meet or exceed these requirements.

B. Purpose:

The intent of this program is to reduce the potential for injury to PCS employees, by creating an awareness of the dangers for fire, explosion and damage while engaged in Confined Space Entry Work. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to
Washington State: WAC 296-809 ANSI/ASSI: Z117.1-2003

D. Definitions:

1. ***Qualified Person*** - One who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter (Confined Space Entry Work), as it relates to each specific project.

2. ***Competent Person*** – One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which may be unsanitary, hazardous, or dangerous to personnel, and who has the authority to take prompt measures to eliminate them.

3. ***Confined Space*** - This is a space which is barely large enough, yet configured that an employee can bodily enter and perform assigned work…and:

    a. Has limited or restricted means for entry or exit;

    b. Is not designed for continuous occupancy.

    Typical examples of confined spaces found associated with PCS projects are electrical vaults, excavations & trenches (where potential or known hazards exist), utility manholes, sewers, elevator shafts/pits. In all these cases, a PCS Qualified Person will be required to make a determination as to what is and what is not a safe confined space, or a space with reserved conditions applied and with specific mandated Safety requirements attached.

    Note: All PCS employees who enter Confined Spaces must understand that the hazards of confined space entry are not always seen, smelled, heard, or felt. What may appear to be a harmless situation may indeed be a potential threat. In addition, there are no minimum depth level

within Confined Spaces, so great care must be taken to ascertain all relative conditions prior to entry.

4. ***Permits*** - Permits may not be required for Confined Spaces is that:

   a. Meets the criteria for a Confined Space as listed above.

   b. Does contain or has the potential to contain hazardous atmospheric conditions, energized or electrical gear, mechanical, engulfment, entrapment or may have hazards introduced through welding, cutting or painting operations.

      NOTE: Do not over look the obvious – animals, insects or reptiles that can create hazards during a Confined Space Entry.

5. ***Confined Space Survey*** - This is a survey that is initially conducted by a Qualified Person of PCS' choosing to study a project or operation to identify Confined Spaces Limitations as defined by prior established standards.

E. Requirements:

PCS personnel entering into Confined Spaces on any PCS Project must first complete the PCS Confined Space Entry Program (CSEP) and become Certified by PCS Safety Management. A Job Hazard Analysis (JHA) must also be completed for this type of operation.

1. This applies where oxygen deficiency (atmospheres containing less than 19.5% oxygen) or a hazardous atmosphere exists or could be reasonable be expected to exist, such as in excavations in landfill areas or excavations is areas where hazardous materials area stored nearby, the atmosphere in the excavation must be pre-tested before employees will be allowed to enter excavations 4 feet, or greater than, in depth.

2. Prior to excavating activities, all employees will be required to carefully review PCS' Employee Health and Safety Plan (EHASP) for handling contaminated soils .

F. Training:

1. Training for Confined Space Entry and Rescue Procedures is required of all employees involved projects of this nature. Employees who will or may perform such work must have their training completed prior to initial assignment in confined space, and have their training updated at least annually thereafter. As a minimum, training must cover the following procedures:

   a. Hazard recognition.

   b. Emergency procedures.

   c. Use of Personal Protective Equipment (PPE).

   d. Electrical/mechanical lockout and tag-out procedures.

e. Proper use and limitations of atmospheric testing devices.

f. Proper use of special equipment and tools.

Note: Refresher training of personnel shall occur when employees are noted to be in violation of the required Safety Standards or the specific duties listed in the Standard.

G. Job Descriptions:

1. Entry Supervisor

   Is the individual (employer, foreman, superintendent) who is responsible for determining if acceptable entry conditions are present where entry is planned, verifies rescue services are available prior to entry, authorizes entry, oversees the entry operation and terminates the entry permit when required.

2. Attendant:

   Is the individual stationed outside the confined space who monitors the authorized entrants and who performs all entrant duties assigned and shall have no other duties.

3. Authorized Entrant:

   Is any employee who is trained and authorized to enter the confined space.

4. Rescue Personnel:

   Trained PCS designated personnel who provide rescue and emergency services.

5. Documentation:

   The names, dates, and type of training performed are to be documented and maintained in the PCS Human Resources Office. PCS's records are be available via written request by qualified, designated Safety Inspection authorities.

H. Personal Protective Equipment

1. Suitable and necessary rescue equipment including retrieval gear shall be immediately available at all times. This equipment shall be selected with the potential hazards or possible contingencies anticipated during the work operations.

2. Employees entering into both permitted and non-permitted confined spaces must be wearing a full body harness for retrieval purposes.

3. Employees exposed to physical hazards shall utilize appropriate Personal Protective Equipment (PPE) for the work to be performed.

4. Protective clothing shall be worn where burning or irritating substances may be encountered. Where flammable vapors may be present, use only non-spark

producing hand tools. Power tools must be grounded and have Ground Fault Circuit Interrupter (GFCI) protection.

5. When welding, cutting, or burning takes place inside a confined space, the use of airline respirators or pressure demand self-contained breathing apparatus shall be required for all entrants if the space can not be properly ventilated.

I. Atmospheric Conditions

The most common atmospheric conditions that constitute hazards during confined space entry are oxygen deficiency, combustible and flammable gases and vapors, and toxic gases and vapors. In fact, some of the deadliest gases and vapors have no odor or other distinguishable characteristics at all.

1. Oxygen Deficiency:

   Normal air contains 20.9 percent oxygen. Oxygen-deficient atmospheres contain less than 19.5 percent oxygen. Never permit any employee to work in any atmosphere where the oxygen content is below 19.5 percent without providing ventilation or air supplying respirators. Oxygen deficiency occurs in confined spaces when the level of oxygen is reduced below the limit to support life. Some of the more common causes of this hazard are oxidation of metals, bacterial action, combustion, and displacement by other gases. Examples of these atmospheric conditions are as follows:

   a. The slow oxidation of metals as rust can be prevalent in tanks made of iron or steel. This process depletes the confined space of oxygen.

   b. Work in or around sewer lines and sanitary landfills may contain enormous amounts of bacteria. Certain bacteria consume oxygen and produce carbon dioxide.

   c. Combustion is the rapid oxidation of a substance. An ignited welding or cutting torch consumes oxygen rapidly and may leave an area dangerously low in oxygen if ventilation is not provided.

   d. By the same token, oxygen enriched atmospheres with levels above 23.5 also constitutes a hazardous atmosphere.

2. Combustible/Flammable Gases and Vapor:

   a. Combustible gas and vapor hazards include naturally occurring gases and vapors or a large group of liquids used as fuels and solvents. Some of these liquids vaporize quickly. Both gases and vapors when mixed with air will burn or explode when ignited. Besides having a fire potential, many combustible gases and vapors are also toxic.

   b. Some flammable gases and vapors are heavier than air. These gases and vapors are frequently found in sewers, pits, and other low-lying confined spaces.

c. Some flammable substances may leak into ground water that seeps into excavations and vaporize, creating an explosive atmosphere. Some types of bacteria produce methane gas. Methane is the chief constituent of natural gas and is extremely explosive. Methane is often found in the vicinity of swamps, marshes, bogs, and sanitary landfills.

3. Toxic Atmospheres:

Toxic substances are commonly found in industry, as well as being generated by natural processes. These substances include all gases and vapors that are known to produce disease, acute discomfort, bodily injury, or death. There are two major classes of toxic substances found in confined areas: asphyxiates and irritants.

4. Asphyxiates:

An asphyxiate can be any gas that causes asphyxiation by displacing the oxygen in the atmosphere. Asphyxiates may also render the body incapable of utilizing an adequate oxygen supply. This is called chemical asphyxia. For example, carbon monoxide kills by chemically combining with hemoglobin in the blood. This combining process greatly reduces the ability of the blood to carry oxygen to the body tissue. Death occurs due to chemical asphyxiation. Never operate gasoline or diesel power equipment in or near a confined space.

5. Irritants:

Some gases in low concentrations are mildly irritating to the respiratory and nervous systems. At high levels, they cause death. These gases work by paralyzing either the body sensory or pulmonary functions. Death results from asphyxiation. Common irritants found in industrial construction are hydrogen sulfide (H2S), sulfur dioxide (SO2), and nitrogen dioxide (NO2). The following chart shows the irritants found in industrial construction:

Gas	Physical Characteristics	Flammability Lower Exposure	Flammability Lower Exposure
Carbon Monoxide (CO)	Colorless Odorless	12.5%	35 PPM
Carbon Dioxide (CO2)	Colorless Odorless	Nonflammable	5000 PPM
Methane (CH4)	Colorless	5%	500 PPM
Hydrogen Sulfide (H2S)	Colorless Suffocating Odor	Nonflammable	2 PPM
Nitrogen Dioxide (NO2)	Brown Pungent Odor*	Nonflammable	3 PPM

*Cannot be smelled at lethal concentrations due to paralyzing action of the olfactory system.

Other potentially hazardous gases, fumes, and vapors are used or created by construction operations such as welding, cutting, and painting. These substances include zinc, cadmium, chromium, magnesium, lead, and toluene. If these substances are allowed to accumulate, they can cause both acute and chronic injury and illness.

J. Isolation and Lockout

1. All confined space areas that cannot be isolated from the possible release of hazardous substances must be treated as if the area actually contained the hazardous substance. All valves must be locked closed along with lines leading to the confined space. Whenever possible, the lines should be taken apart. Blinds must be inserted between flanged connections. Be sure that blinds are of sufficient strength to handle any pressure building if the pump were accidentally turned on.

2. Electrical circuits and machinery that could cause injury shall be locked and tagged out before entry is permitted. The main switch to the electrical power supply for any pump, fan or motor must be locked in the "off" position. Locks must have only one key, and it should be in the possession of the individual working in the confined space. If more than one person is working in the confined space each should have his or her own lock and key. A tag shall be used in conjunction with the use of locks. See Section 3.3 of this manual.

K. Clean and Purge the Confined Space:

1. Once the space has been isolated, cleaning and purging may be required. The extent of these procedures depends on the nature of the material in the space, decomposition or other chemical reactions that may affect the atmosphere, the level of residue and amount of foreign contaminant buildup on the inside walls, the configuration of the space, including size and location of vents.

2. A confined space that has been used to store liquids, chemicals, or food must be purged of all sediment, sludge, or residue. Even small amounts of material can create lethal quantities of hazardous gases or vapors. These steps should be followed:

    a. Empty the Confined Space and drain or pump out remaining sludge and residue.

    b. Flush the Confined Space if possible. Flushing can range from simply hosing the walls and floor to completely filling and draining the area.

    c. It may be necessary to purge the Confined Space further with steam, nitrogen, or an inert gas after it has been flushed. The environment inside the Confined Space should be tested at this point to determine if further purging is necessary. If sediment adheres to the walls or floor, or if corrosion rust is heavy, purging is almost always necessary.

L. Ventilate the Confined Space:

1. All "permit required" confined spaces, regardless of their content, must be ventilated. The term "ventilation" refers to a Continuous Forced Air system and not natural ventilation. If the space has been re-classified, ventilation is optional. NOTE: A PCS Qualified Person will review the dimensions of the Confined Space and calculate the number of air changes required before the space is entered.

2. Ventilation is required to eliminate oxygen deficiency, accumulated combustibles or toxic substances. Therefore. the space must be sufficiently ventilated so that levels of combustibles do not exceed ten percent of their lower explosive limit (LEL), and toxic substance levels do not exceed their respective Threshold Limit Values (TLV).

   NOTE: The most efficient way to ventilate a space is to introduce fresh air near the bottom of the space and discharge it near the top. Any system of positive ventilation must maintain a constant flow of fresh air through all areas of the space.

3. While combustibles are being purged, any Spark Source outside the space, such as an electric or combustion motors, should be kept away from the discharge stream.

4. Oxygen must never be used to purge or ventilate a Confined Space. Oxygen concentrations in excess of 21 percent may significantly increase the combustibility of other substances in the space.

M. Testing the Atmosphere within the Confined Space:

1. After the Confined Space has been cleaned, purged, and ventilated, the atmosphere shall be tested for oxygen deficiency, combustibility, and toxicity.

2. If the atmosphere still tests positive for any hazard, a PCS supervisor must be notified immediately.

   NOTE: PCS will maintain all copies of Confined Space Entry Permits and make them available for review by any authorized regulatory agency.

3. When testing the atmosphere within the Confined Space is not possible by testing from the outside…a Self Contained Breathing Apparatus, Supplied Air or other means must be utilized.

   NOTE: Cartridge type respirators DO NOT produce oxygen in oxygen deficient atmospheres.

   NOTE: All confined spaces regardless of classification must have the atmosphere tested.

4. At a minimum, atmospheric testing shall take place prior to the authorized entrant(s) entering the Confined Space or upon re-entry of the space after the entrant(s) have vacated the space for a minimum of (30) thirty minutes. Other circumstances may require more frequent monitoring or continuous monitoring of the space.

5. Persons responsible for using atmospheric testing equipment shall be trained in their use as specified by the manufacturer. This equipment shall also be calibrated as specified by the manufacturer and documentation from such tests shall be retained. At a minimum, gas meters shall be calibrated monthly.

   Note: As discussed earlier, gases and vapor possess different characteristics, with some being heavier than air. When testing the atmosphere be sure to test not only the area at the top, but also all areas down through the bottom of the confined space, including all entrant breathing zones.

N. Communication:

Communication shall be maintained with all personnel in confined spaces. This shall be accomplished by utilizing one or more of the following methods:

1. Visual
2. Voice
3. Telephone
4. Two-way Radio

NOTE: Proper selection may be pre-determined by whether an explosive atmosphere exists within the areas of intended use.

O. Entry Permit

1. All work performed in Confined Spaces shall be completed under a Confined Space Entry Permit System. PCS Management will complete and monitor the all permits. Permits shall be valid for one (1) shift only!

2. The purpose of the Entry Permit is to ensure that all necessary precautions have been taken before any Confined Space entry is made. The type of operation to be performed in a Confined Space will determine Safety Requirements necessary during the work. The Confined Space Entry Permit outlines such precautions.

3. It is the responsibility of the PCS Entry Supervisor to complete and sign the Entry Permit. as well as discuss all information documented on the Permit with the individuals involved in the Confined Space Entry.

4. The Confined Space Entry Permit shall be posted at the entrance into the Confined Space.

   NOTE: Under WAC Regulations, PCS will retain each Cancelled Confined Space Entry Permit for at least one year.

P. Attendant Support:

1. At least one Support Attendant shall be stationed outside of a "permit required", confined space while that space is occupied. If the space has been re-classified to "non-permit" required status, a Support Attendant is not required, but still recommended. The Support Attendant shall have no other duties.

2. The Support Attendant must remain at this station until Entry is terminated or another Support Attendant relieves the existing one of their duties.

3. Communication with the Authorized Entrants is a duty of the Support Attendant.

4. The Support Attendant must also monitor the activities of the entrants in the Confined Space and order an evacuation of the space if required, i.e. if a hazardous condition is detected.

5. The Support Attendant is also responsible for summoning rescue or emergency personnel to the Confined Space if required.

   Note: The Support Attendant must also be properly trained, equipped, and capable of removing the worker(s) from within a Confined Space in an emergency.

   NOTE: Support Attendants are instructed not to enter the Confined Space to perform rescue unless another Support Attendant is present, and they have each been thoroughly trained and equipped in Confined Space entry rescue. Support Attendants involved in rescue operations must be current in their Certification for CPR and First Aid.

Q. Entry:

1. Under no circumstances shall anyone enter a Confined Space without first testing it for hazardous atmospheric conditions.

   NOTE: When accepted engineering control measures such as continuous forced air ventilation are employed and air sampling determines that flammable or toxic limits have been exceeded or an oxygen deficiency exists, or other existing hazards cannot be controlled, the space must not be entered until hazardous conditions are corrected and re-certified as "Safe"..

2. Access and egress shall be maintained at all times while work is being performed in a confined space

3. All personnel entering Confined Spaces shall wear a full body harness. If the space is deemed "permit required" a lifeline must be employed and attached from the harness to the retrieval system, unless being attached will increase the overall risk of injury to the entrant or would not contribute to the rescue of the entrant. These conditions should be predetermined, identified and noted within the related Job Hazard Analysis.

4. Before entry is made into any energized electrical cable vault or manhole, an infrared tester or equivalent must be used to scan the cables and connector components. If a temperature difference of 10 degrees Fahrenheit is detected

between the cable and connector components, or any reading greater than 140 degrees Fahrenheit is detected from the cables or components, the entry must not be made. A PCS supervisor must be contacted, who take "next step actions" to correct the situation.

R. The Authorized Entrant:

1. Shall be able to recognize potential hazards that may be encountered during the entry.

2. Must be able to respond to emergencies, which includes methods for self-rescue.

3 Must recognize symptoms and warning signs of exposure to potential hazards or prohibited conditions.

4. Shall notify the Support Attendant of emergencies or unacceptable conditions in the Confined Space.

5. Exit the Confined Space immediately if symptoms, warning signs, or unacceptable conditions occur, or if they are detected by the Support Attendant or Entry Supervisor.

S. Non-Permit Required Confined Space:

1. Some Permit-Required Confined Spaces may be re-classified to Non-Permitted Confined Spaces once all safety and health hazards or potential hazards have been eliminated. To re-classify a Permit-Required Confined Space to a Non-Permitted status, both the Entry Permit and the Re-classification Permit must be completed. Under this situation, monitoring of atmospheric conditions will still be required.

2. Employees entering the Non-Permitted Confined Space must still be wearing a full body harness, and a retrieval device must be readily accessible.

T. Rescue and Emergency Services:

1. Any PCS employee who have been designated to provide Confined Space Rescue and Emergency Services must take the following measures:

   a. Be trained with the required PPE.

   b. Fully understand how to perform their required duties.

   c. Be fully trained in Basic First Aid and CPR.

   d. At least annually, be re-trained on removing victims through openings and portals of the same size, configuration, and accessibility as those Confines Spaces from which an actual rescue may take place.

2. A PCS designated Supervisor who assigns Rescue and Emergency personnel must:

   a. Select a rescue team or service staff (prior to beginning any Confined Space work) that has the capability to reach the victim within a required time frame that is appropriate for the Confined Space hazards identified.

   c. Inform the Rescue Team or Service of the Hazards they may encounter when called on to perform the rescue.

   d. Provide the Rescue Team or Service with access to all Permitted Confine Spaces from which rescue may be necessary.

U. Illumination:

1. PCS employees must not enter Confined Spaces without an approved portable light. The use of an open flame for lighting is prohibited.

2. In Confined Spaces where a flammable atmosphere exists or may exist, only approved low-voltage, explosion-proof lights shall be permitted. Such lights shall be properly identified and in good condition.

3. Approved battery-powered flashlights (three volts or less), properly marked for use only in a hazardous areas, shall be permitted when flammable atmospheres are present.

4. All external-powered illumination devices shall be of the approved type and equipped with a ground fault circuit interrupter.

   Temporary illumination used in areas other than where flammable atmospheres are present, must meet all National Electrical Codes and local requirements, and be of the grounded type. Illumination is covered within…Section 2.20 of this manual.

V. Fire Protection

The following conditions must be assured in Confined Spaces at all times. PCS affected personnel are refer to consult the Fire Prevention Sections in this manual for general information concerning overall work area Fire Prevention Requirements.

1. Flammable liquids (i.e., acetone, alcohol) must be stored in approved (UL or FM) flammable liquid containers or dispensers. The amount of such flammable liquids shall not be in excess of the amount necessary to perform the work each day.

2. Properly rated fire extinguishers shall be immediately available.

3. Cylinders containing oxygen, acetylene or other fuel gases shall not be taken into confined spaces.

4. All used rags, brushes, wipes, and gloves shall be stored in metal containers with lids.

5. A "fire watch" shall be posted during all welding, burning and heating operations to monitor for fires. This person shall ensure that there are no fire conditions present after the work has ceased or at the end of a work shift.

6. All flammable gas equipment such as hoses and torches shall be free of defects and inspected by a qualified PCS employee prior to Confined Spaces usage.

7. To eliminate the possibility of fire in Confined Spaces as a result of gas escaping through leaking, or improperly closed torch valves, the gas supply to the torch must be positively closed at the tanks, whenever the torch is left unattended for a period of thirty (30) minutes or greater. During such times, the torch and hoses must be removed from the confined space. Fuel gas and oxygen hoses are not be disconnected from the torch or other gas-consuming device, while in the Confined Spaces.

SELECTION GUIDE FOR CONFINED SPACE ENTRY PROCEDURES

TYPE OF HAZARDS	PROCEDURE	PAPERWORK REQUIRED	ATTENDANT REQUIRED	AIR TESTING	VENTILATION	Rescue Equipment
• Electrical, Entrapment, Engulfment • Contaminated or Potentially Contaminated Atmosphere • Oxygen Deficient • Other Recognized Hazards	Permit-Required	Completed Entry Permit	Yes	Required	Required	Entrant (s) in full body harness with lifeline attached to retrieval gear.
• Poses No Actual or Potential Hazards	Re-Classification to Non-Permit	Completed Entry Permit + Authorization for Entry	Optional	Required	Recommended	Entrant (s) in full body harness with retrieval gear readily available.

PUGET CONSTRUCTION SERVICES, INC.

Permit date: / / **Work shift:** 1st ☐ 2nd ☐ 3rd ☐ **Expires:** / /

Time started: _____ Time Permit Expires: _____

Permit space to be entered (name and location): _____

Purpose of entry: _____

Names of trained, authorized individuals

- Entry supervisor: _____ Signature: _____
- Entry attendant: _____
- Authorized entrants: _____
- Authorized entrants: _____

Emergency contact information

Emergency responder: _____ Phone number: _____

Contact person: _____ Time: _____

Pre-entry requirements

Requirements	Yes	No	N/A	Requirements	Yes	No	N/A
Lockout - tagout/de-energize	☐	☐	☐	Hot work permit	☐	☐	☐
Pipes(s) broken or capped or blanked	☐	☐	☐	Fall arrest harness/lifeline/tripod	☐	☐	☐
Purge or flush or drain	☐	☐	☐	Personal protective equipment	☐	☐	☐
Ventilation:	☐	☐	☐	*Hardhat*	☐	☐	☐
Secure area	☐	☐	☐	*Gloves*	☐	☐	☐
Safe lighting	☐	☐	☐	*Safety glasses*	☐	☐	☐
Non-sparking tools	☐	☐	☐	*Respirator, type*	☐	☐	☐
Communication method:	☐	☐	☐	*Other PPE:*	☐	☐	☐
Contractor employees involved	☐	☐	☐	*Other PPE:*	☐	☐	☐
Additional info or equipment required for safety:							

Space-monitoring results		**Test 1**	**Test 2**	**Test 3**	**Test 4**
Monitor at least every four hours	**Permissible entry levels**	Time: Initial:	Time: Initial:	Time: Initial:	Time: Initial:
Percent oxygen	19.5% to 23.5%				
Combustible gas	Less than 10% LEL				
Other toxic gas					
Other toxic gas					
Gas Tester Name	**Instrument Used**	**Model / Type**	**Serial Number**		

PUGET CONSTRUCTION SERVICES, INC.

Possible atmospheric hazards	Yes	No	N/A
Lack of oxygen	☐	☐	☐
Combustible gases	☐	☐	☐
Combustible vapors	☐	☐	☐
Combustible dusts	☐	☐	☐
Toxic gases/vapors	☐	☐	☐
Possible non-atmospheric hazards			
Noise	☐	☐	☐
Chemical contact	☐	☐	☐
Electrical hazard	☐	☐	☐
Mechanical exposure	☐	☐	☐
Temperature extreme	☐	☐	☐
Engulfment	☐	☐	☐
Entrapment	☐	☐	☐
Other non-atmospheric hazard	☐	☐	☐

Pre-entry checklist

Entry is not permitted until these items are completed.

OK	Needs action	
☐	☐	Before entering the permit space, the supervisor or designee must notify the rescue team.
☐	☐	A minimum of two employees must be assigned to work involving permit space entry. One employee must remain outside the permit space at all times.
☐	☐	The surrounding area must be surveyed to show that it is free of hazards such as drifting vapors from tanks, piping, sewers, or vehicle exhaust.
☐	☐	Other required permits, such as hot work permits, are obtained.
☐	☐	Those responsible for operation of the gas monitor have been trained.
☐	☐	Gas monitor calibration tests and functional test (fresh air calibration) have been performed this shift on the gas monitor.
☐	☐	The atmosphere will be continuously monitored while the space is occupied, if required by entry procedure.

This permit has been terminated for the following reason:

☐ Work completed ☐ Canceled Time: Note:

Supervisor's signature Time: Date: / /

3.2 – LOCKOUT / TAGOUT

A. Scope:

This section defines the minimum safety requirements for Lock-out / Tag-out procedures to assure the safety of PCS personnel and equipment when performing work on or around processes, systems, or equipment capable of having an energy source applied or the release of stored energy.

B. Purpose:

This procedure is intended to protect PCS personnel and property from injury caused by the release of stored energy, or the accidental activation of processes, systems, or equipment. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: OSHA: 29 CFR 1910 Subpart S, 29 CFR 1926 Subpart G,

Washington State: WAC 296-803, and WAC 296-155-429,

Sections 2.20 Electrical Safety and 3.5 Energized Electrical Work of this manual.

D. Definitions

1. ***Lock-out Device*** - A device that utilizes a positive means such as a uniquely keyed lock with the key kept under the control of the authorized employee to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Examples of acceptable lock-out devices include, but are not limited to, blank flanges, bolted slip blinds, or other similar means.

2. ***Tag-out Device*** – A tag used in the Lock-out/tag-out Procedure. Examples: Danger, Do Not Operate, Do Not Start.

3. ***Qualified Person*** – A person familiar with the construction, operation, and hazards of the specific equipment involved and has training in avoiding hazards.

E. General

1. All Lock-out/Tag-outs, utility outages, utility disruptions, and re-energization/re-pressurizations must be coordinated through a PCS Site Supervisor.

2. The PCS Qualified Person is responsible for ensuring adequate protection is provided through Lock-out/Tag-out procedures for all processes, systems, or equipment and personnel under there control.

3. The PCS Qualified Person is responsible for seeing that processes, systems, or equipment de-energized/depressurized are properly tagged, locked out and rendered inoperative.

4. Zero Energy Storage must be assured by bleeding, blocking, or blinding control circuits or systems to assure deactivation. Trying to re-activate a Zero Energy Storage condition to ensure a positive Lock-out will then require re-testing of the system.

5. A Lock-out/Tag-out device and attachment apparatus must be used to secure main power sources. This includes electrical panels and switches which service equipment and/or processes that upon activation could cause unexpected movement or release of energy. This procedure applies to inspection, cleaning, alteration, installation, and repair activities.

6. When more than one employee is working on a system or piece of equipment, each must apply their own individual Lock and Tag.

   Note: These procedures applies to all energy sources that are mechanical, air, hydraulic, thermal, chemical or spring loaded.

F. Specific Requirements for PCS Craft Personnel:

A PCS' Qualified Person will brief all employees who will be performing work on the equipment or system to familiarize them with the Lock-out/Tag-outs procedures before any work is started. The following procedures musts be read and discussed with all PCS craft personnel to ensure complete understanding of the procedures. PCS craft personnel must follow all the following guidelines noted below.

G. Lock-out/tag-out Guidelines

1. Identify all sources of energy, movement or hazardous substances. Also, locate all isolation points and disconnects that deactivate the equipment or system.

2. Physically isolate, disconnect, or eliminate all hazards by tagging/locking of circuit breakers, motor control switches and removal of fuses, installing blinds, closing and locking of valves, etc.

3. Immobilize and lock-out all isolation points and disconnects.

4. Tag all isolation points and disconnects.

H. Lock-out Procedure:

1. When more than one employee is working on a system or piece of equipment, each must apply their own individual lock and tag to the lock-out device.

2. Padlocks are the preferred lock-out devices.

3. Locks shall not be a common key type.

4. The individual installing the lock must retain the key.

5. After the equipment or system has been locked out, attempt to start it to test the effectiveness of the lock-out

6. Always check all locks and tags at the start of each shift. Never assume the equipment or system is locked out before starting work. If any locks or tags have been removed, contact your supervisor immediately!

7. Only those who install the tags and locks may remove them.

Note: A written procedure will be posted in place at the respective job-site in denoting removal procedures for any lock and tag when the tag signer is absent from the job site. In addition, the procedure must only be performed, after a check is made to assure that all persons are out of danger, and that the equipment is in working order.

I. Tagging Procedures:

1. The tag is to be clearly signed in ink by the applying employee. This includes their full name, badge number, and the date.

2. A signed tag must always accompany a lock.

3. Tags must be placed directly on the lock and in a place as visible as possible.

J. Reactivating the System– Clearance Orders/Switching Orders:

1. Before energy is restored to the process/equipment, a visual inspection of the work area must be made by an authorized individual.

2. The reactivation of the system should only be completed through a set step-by step published procedure, which prevents injury or equipment damage when performed properly. This includes: removal of all personnel, tools, and equipment from the danger zone; the assurance that the equipment is operationally intact; and, there exists no incomplete work or obstructions. Examples include:

   a. Valve line-up to avoid product spills

   b. Pressure tests on hydro or pneumatic systems

   c. Flushes for cleanliness

   d. Electrical tests for shorts or ground

   e. Rotational/functional tests

3. A final check of the system must be made to ensure the equipment or system is properly functioning.

K. Electrical Specific - Energizing New Equipment:

1. Prior to Energizing New Equipment:

   a. All electrical gear must be locked and tagged out by a Qualified Person(s).

b. All electrical gear must have devices installed or be capable of installation of multiple locks.

c. In the event a positive lock-out cannot be made (such as a toggle switch), the individual switch must be de-energized and a tag-out device installed by the person working on it.

d. All tag-out devices must be signed and dated by the individual placing it with instruction as to why the tag was placed.

e. A PCS Qualified Person is responsibility to ensure that no work is performed beyond the protection of the lock and tags installed.

f. No lock and tag may not be removed, unless a PCS Qualified Person has approved such action.

2. Energizing New Equipment for the First Time:

a. Prior to energizing, a PCS Qualified Person will inspect all electrical gear to ensure compliance with Part I of this procedure.

b. "DANGER – HIGH VOLTAGE" signs will be placed on all switch-gear and Motor Control Centers (MCC), as well as on all distribution panels and disconnect switches prior to energizing. Signs shall be of adequate size and be installed so as to be visible from any approach. A sticker reading "HOT" or "ENERGIZED" must be used to identify all energized circuits in the distribution panels and switchgear. These stickers are to be of the peel-off type.

c. Once energized, the Contractor has the responsibility to see that these stickers are used in each area as the sections are energized.

d. Any questions as to the adequacy of the protective measures installed shall be forwarded to the Contractor or the Engineer.

3. Crafts Working on Energized Electrical Gear or Equipment

a. Prior to working on any electrical gear or electrically driven or powered equipment, every Craft or employee associated with that activity shall obtain a lock and two (2) Warning tags from the PCS Qualified Person. These locks and tags must be installed on any associated switch-gear and the local equipment, control switch.

b. A "Warning" tag that identifies the person by name, badge number, or other related I.D. must accompany each lock.

c. Only the individual who placed the lock and tag may remove it from the equipment.

3.3 - PORTABLE HEATERS

A. Scope:

This section outlines the minimum safety requirements for the use of portable heaters and salamanders.

B. Purpose

To minimize the potential for fire, smoke damage, dangers to PCS employees and potential impacts to the public. All PCS employees are required to be familiar with the guidelines noted below.

C. Reference:

Refer to: International Fire Code (IFC)

Section's 305 and 605 for the heaters; and IFC Chapter 38 for Liquid Propane Gas

D. Definitions:

1. ***Below Grade*** – Any underground level deeper than the Bag Well.
2. ***Carbon Monoxide*** - CO
3. ***Liquid Propane*** – LP

E. General Requirements:

1. Portable heaters must be listed, installed, used, and maintained in accordance with the manufacturer's recommendations.
2. Portable heaters, while in operation and unattended must be bracket mounted and elevated above the floor surface.
3. Portable heaters must be equipped with "tip-over" protection.
4. Portable heaters must be switched "off" at the end of each shift unless a following work shift will occupy the area.
5. Proper housekeeping must be maintained in areas of portable heaters.
6. Portable heaters must be installed with proper clearance in regard to combustible material, equipment, and construction.
7. Portable heaters must be monitored for safe operation and maintained in proper working condition.
8. When operated in enclosed structures, adequate ventilation must be maintained.

9. Building materials shall be fastened securely or guarded so as not to contact portable heaters.

10. Contractors violating these procedures must remove the portable heaters from service.

F. Requirements for Liquid Propane Heaters/Devices:

1. The use of Liquid Propane below grade is prohibited by PCS and local Fire Departments, unless otherwise note By a PCS on-site Supervisor. A permit will be required to use LP Gas, Below Grade.

2. Liquid Propane is Carbon Monoxide producing. When CO producing equipment is to be utilized “indoors”, PCS will supply a Plan to monitor and mitigate the hazards to job-site workers. The Plan will be posted at the job-site for review.

3. A Hot Work Permit will be acquired and posted for LP Heaters and Salamanders.

4. Adequate ventilation must be provided, and Heaters and Salamanders shall be equipped with an approved automatic device to shut off the flow of gas to the main burner in the event of a flame failure.

5. Heating devices must be installed as to prevent direct or radiant heat to the LP containers.

6. If two or more heating devices of either the integral or non-integral types are located in a non-partitioned area on the same floor, the LP containers must be separated from each other by at least 20 feet.

G. Requirements for Liquid Propane Storage

1. Storage of LP below grade is prohibited.

2. Storage of LP within buildings or enclosed spaces, such as a "Conex box" is prohibited.

3. Cylinders must be stored in a suitable ventilated area.

4. Cylinders must be secured against displacement.

5. Cylinders must be stored away from fire, flame, or heat.

6. Warning signs prohibiting smoking or open flames must be posted, maintained, and enforced 25 feet around storage areas.

7. Fire Protection must be provided with at least one approved portable