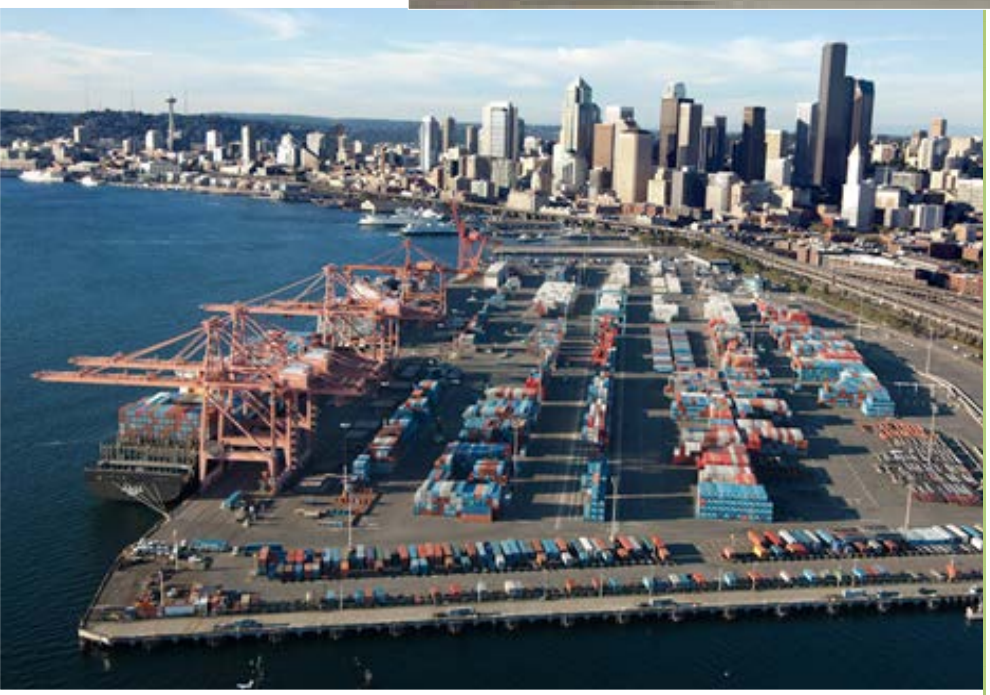
Port of Seattle®

Construction Safety Manual



Port of Seattle

v03.22.16

Table of Contents

WELCOME TO THE PORT OF SEATTLE

These Safety and Health Policies have been established to promote compliance with the Port's policy and procedures regarding site safety, health, environmental, and security standards. It also serves to explain the responsibilities of Contractors working on projects.

Please read these procedures and make sure that you fully understand all sections. More importantly, *use them* to ensure the safety and wellbeing of your employees. Safety is an essential element of construction at the Port. Each Contractor is responsible for carrying out their responsibilities under the law. As a Contractor, you are expected to maintain these high standards.

Thank you for your cooperation!

QUESTIONS

Please contact the Manager of Construction Safety Management at (206) 787-5587.

NOTE: This Manual is kept in the Construction Safety Services office and is available to anyone upon request by CD. This Manual can also be accessed online at: https://www.portseattle.org/Business/Construction-Projects/Airport-Tenants/Pages/Reference-Documents.aspx

PURPOSE

The purpose of this Safety and Health Manual is to outline a plan for preventing job-related accidents.

The Manual sets forth the many elements that all Contractors and Subcontractors (of every tier) must include in their safety program. This Manual is not all-inclusive. Other elements may be added or conveyed individually to Contractors to whom they expressly apply. Some Contractors, by nature of the specific type of work being performed, must integrate other essential elements within their own safety program.

The role of Construction Safety Management in achieving construction safety and health includes the oversight for project safety. This function does not supersede, override, or take precedence over that of construction Contractors, who are ultimately responsible for the safety and health of their personnel and protection of their property. The key function of Construction Safety Management, as it relates to construction safety and health, is to monitor Contractor compliance with safety and health standards required by law.

This Manual sets forth basic responsibilities, guidelines, rules, and regulations for all personnel involved in construction at the Port. The intent is to enhance and supplement any safety and health standards that are required by contract documents, or by law, and are applicable to Port construction projects. The 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 the Contractor's and each employee's responsibility to ensure that they comply with all safety directives required by law, and that their own safety program includes such compliance.

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 shall apply. This Manual is subject to revisions and updates as the project progresses.

GOALS & OBJECTIVES

The goal of this Manual is to establish and maintain a safe working environment for our employees, Contractors, visitors, and the public. It is the responsibility of each individual to assist in accomplishing the following objectives:

- 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.
- 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. This shall include the orientation of all new employees, regular safety meetings, pre-task planning, and ongoing safety training.
- Minimize hazards/disruptions to the traveling public by controlling access to construction areas, following established safety procedures to avoid impacts to airport operational systems, and secure work areas adjacent to those spaces frequented by the public.
- Establish and maintain a system that promptly identifies and corrects unsafe practices or conditions.
- Establish emergency procedures and communications that will minimize fire, police, or ambulance response-time in the event of an occurrence.
- As a minimum, 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 at this facility depends directly upon individual effort and commitment to the goals and objectives of this program. We must all do our part, and encourage and demand others to do theirs."

- ***Tina Soike*, Chief Engineer**

MISSION STATEMENT

The Port of Seattle is dedicated to the principle that a safe project is a good project. The Port is committed to the safety of its employees, the surrounding community, and the environment.

While the Port has the responsibility for conducting business in a manner that strives to prevent accidents, all Contractors and their employees share that responsibility. All employees are expected to work safely and contribute to the safety of others. Contractors must make every reasonable effort to provide a safe and healthy work environment free of recognized hazards.

The effectiveness of this safety program depends on the combined efforts of the Port personnel, Contractors, and all labor organizations. To achieve this goal, a Safety Committee has been established. This Safety Committee will meet monthly to monitor projects and provide input on safety and health issues.

EMERGENCY PROCEDURES

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

Dial 911 – from a non-Port phone
Dial 9, 911 – from a Port phone

The Port of Seattle has its own fire and police departments located on the airport facility. In case of fire, injury, or emergency at any building or location on the project, contact emergency services at the numbers listed and provide all details required. Stay on the line. 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, station individuals who can assist incoming emergency response personnel to the location quickly. The Contractor is responsible for reporting pertinent information to arriving emergency response personnel.

NOTE: These emergency numbers shall be posted at the jobsite.

Port Police Department	(206) 787-5400
Police / Emergency (from Port phone)	9, 911
Police / Emergency (from non-Port phone)	911

Port Fire Department / Medical	(206) 787-5380
Fire / Emergency (from Port phone)	9, 911
Fire / Emergency (from non-Port phone)	911

Construction Safety Management Office	(206) 787-7936
Manager, Construction Safety Management	(206) 787-5587
Safety Manager	(206) 787-7894

On-site loss of property or materials should be reported to the Engineer and Port Police. Thefts will be prosecuted to the fullest intent of the law.

CHEMICAL OR FUEL SPILL

Notify the following in the event of a chemical or fuel spill.

On Water:

1. US Coast Guard
2. Resident Engineer
3. Port Environmental

On Land:

1. Resident Engineer
2. Port Environmental

EMERGENCY EVACUATION PLAN

The Contractor shall have in place written Site-Specific Emergency Procedures and site evacuation plans. These plans shall include how the Contractor and their personnel will deal with severe weather conditions, natural disasters such as earthquakes, airport emergencies, higher security alert statuses, and construction related emergencies. The plan shall include primary and secondary location/assembly points where Contractor personnel will meet following such conditions, how personnel will be accounted for, and shall be posted in a conspicuous location.

The Contractor shall advise employees of these assembly points at their initial safety orientation. This information shall be posted at the project site and updated as conditions change.

All inquiries from the media regarding any incident occurring on the site shall be referred to the Port's Public Affairs Manager.

EMERGENCY DRILLS FOR BOATS AND BARGES

At a minimum, the following types of drills will be held.

- Fire
- Man Overboard
- Abandon Ship
- Rescue

A lifeboat drill will be held, if so equipped. All drills will start with the announcement, "This is a drill, this is a drill".

A. Fire Drill

1. To be held at least once per month.
2. The drill will include a mock injury. The fire-fighting team will consist of a sufficient number of equipped, trained crew (approximately 6), to properly handle the needs on each vessel. The observer of the fire will sound the alarm before attempting to extinguish the fire. The fire team will muster at the fire station nearest the fire with needed equipment.
3. Reports will be sent to the Incident Commander or designee at each phase of the drill.
4. Standby boat, if available, will be mobilized to a standby position.
5. All personnel not involved with fire-fighting or critical vessel operations will muster as arranged, and a headcount will be sent to the Incident Commander or designee.
6. The rescue/backup team if available will be located for support as necessary.
7. Before securing from the fire drill, the Incident Commander or designee will review and clearly indicate any additional actions that would be taken in the event of a real fire, such as posting a re-flash watch, not re-stowing fire-fighting gear, and other appropriate subjects.

B. Man Overboard

1. To be held at least once per quarter (weather permitting).
2. A dummy will be thrown over the side. The dummy shall be the approximate size, shape, and weight of a person with suitable flotation devices in place.
3. All crew will be informed when the dummy is tossed overboard.
4. The rescue team will muster to the designated boat. If available, a boat will be on standby.
5. A lookout will be placed to do nothing but watch the man overboard and continually point towards him.

6. A ring buoy will be available to be thrown near the person, in an actual occurrence, even if the person cannot reach the buoy, to mark the approximate position and assist in the rescue.
7. A person trained in first aid/CPR will be on scene to provide assistance as necessary.
8. The dummy will be retrieved by the standby or designated boat as directed.
9. At the conclusion of the drill, a suitable entry shall be made in the vessel log including the time taken for the rescue.
10. Before securing from the drill, the Team Leader will review and clearly indicate any additional actions that would be taken in the event of a real man overboard, such as a ring buoy with a light and smoke attachment, would be thrown over the side, mustering of the entire crew to determine who is missing, or other appropriate subjects.

C. Lifeboat Launch

1. To be held at least once per quarter (weather permitting).
2. Only associate crew needs drill. No other persons shall be aboard the boat during the drill.
3. Coxswain is to ensure a clear landing area below before starting to lower the lifeboat. This is to be confirmed to the team leader before lowering.
4. Communications, visual/voice/radio, are to be maintained between the boat and the Team Leader at all times.
5. Once the lifeboat leaves the davits, only the coxswain will do anything to affect the lowering of the boat. Only the coxswain will order the release of the boat from the mooring lines and only when he is assured by visual means that he is waterborne. There will be no exceptions to this policy, regardless of circumstance.
6. Before securing from the drill, the Team Leader will review and clearly indicate any additional actions to be taken.

D. Rescue

1. To be held monthly to simulate recovery of injured personnel from various areas on the vessel.
2. The drill will include the use of various equipment and shall be conducted in a realistic manner. Before securing the drill, the Team Leader and First Aid/CPR person will review and clearly indicate any additional actions to be taken.

Contractor Safety Responsibilities

All Contractors shall be committed to the goal of **Zero Accidents/Injuries**. To achieve this goal, the safety and health of all personnel must receive primary consideration in the planning, scheduling, and execution of the work.

A. The Contractor assumes full and sole responsibility for the onsite safety of its employees performing work under this program.

B. The Contractor shall submit a copy of their Site-Specific Safety & Health Program, as specified in the 01 35 29 – Safety Management to the Engineer for review and acceptance per 01 32 19 – Pre-Construction Submittals. The Contractor is responsible for the submittal and review of their sub-tier contractor programs.

C. The Contractor shall insure that all Subcontractors and 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. The Contractor shall 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. The Contractor shall check for and correct any unsafe practices and conditions that exist in the performance of their work, and shall report to the CIP Safety Staff any unsafe conditions created by others.

F. Prior to a new employee starting work, all Contractor, subcontractor, and tier subcontractors shall receive a site-specific safety orientation administered by the Contractor. Additionally, they shall attend a new hire orientation that reviews the Port's site safety rules and requirements. This orientation is scheduled through the Safety Department and conducted by its Staff.

G. The Contractor shall employ at the site a qualified Site Safety Representative whose duties include the protection of persons and property and administration of the Contractor's safety program. 01 35 29 - Safety Management outlines the qualifications and duties of that individual.

H. It is the responsibility of the Contractor to review the safety program of all subcontractor and sub-tier contractors performing work on their project prior to that work beginning. They shall be made aware of the requirements found in 01 35 29 – Safety Management.

Contractor Safety Responsibilities

I. The Contractor shall conduct, at a minimum, weekly safety meetings with their personnel. Attendance and subjects discussed at these meetings shall be recorded and a copy kept on file.

J. The Contractor shall hold a minimum monthly all-hands safety meeting with its employees, subcontractor employees - subcontractors at any tier. An agenda shall be prepared and distributed for this meeting. The meeting shall include a safety update, and pertinent safety information for upcoming work. The Contractor shall encourage input and involvement from the subcontractors.

K. The Contractor's Site Safety Representative shall attend the monthly Contractor Safety Representative Meeting scheduled by the Program Safety Director. This meeting is held to discuss and resolve relevant issues related to safety and health on Port construction projects. If the Contractor's Safety Representative cannot attend this meeting they shall send a designate in their place.

L. The Contractor shall perform daily inspections of the project and correct substandard safety conditions and practices. These inspections shall be documented.

M. Contractors shall at all times enforce strict discipline and good order among all workers on the project and shall adopt procedures with provisions for disciplinary action or discharge of employees who carelessly or callously disregard these rules or other applicable safety and health regulations.

N. Alcohol, drugs, and weapons shall not be allowed onsite under any circumstances, and shall be cause for immediate removal of the employee.

O. All Contractors and Subcontractors working on Port projects shall have a Substance Abuse Prevention Program.

P. The Contractor is responsible for keeping the workplace clean and handling, on a daily basis, debris generated by the work.

Q. The Contractor shall be responsible for the following:
    1. All 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.
        a. Where regulations require the designation of "Competent Person" the Contractor shall submit the names of those individuals, their qualifications and/or certifications, and the discipline they are deemed competent in. These disciplines include but are not limited to welding, electrical, scaffolding,

roofing, cranes, excavations, lift slab construction, steel erection, and underground construction.

2. Prior to the performance of any work, all Contractor employees shall be instructed as to the hazards, rules/requirements that apply to the work they are to perform.
3. Supervisory personnel shall require all employees working under their supervision to comply with all applicable safety rules.
4. Personal Protective Equipment (PPE) shall be provided to employees, used where required, and maintained in proper condition.
5. The Contractor shall not tolerate practical jokes, horseplay, fighting, or unnecessary risk taken by employees.
6. The Contractor shall train employees in the proper storage and handling of hazardous materials (i.e., flammable, combustible, toxic) and hazardous wastes.
7. The Contractor shall immediately report unsafe acts or conditions observed that are not under their control to the Engineer and Construction Safety to ensure abatement.
8. The Contractor shall make 72-hour notification to the Resident Engineer prior to any work involving water systems, water lines, or fire alarm systems.
9. The Contractor shall assure that all vehicles and equipment working on the Air Operations Area (AOA) are equipped with appropriate warning lights or flags meeting FAA requirements found in Advisor Circular #AC150/5370-2C.
10. The Contractor shall notify the Engineer and Construction Safety immediately in the event of a site inspection by Labor & Industry (L&I) to ensure the Port's representation at such meetings or inspections. Copies of any documentation, citations or correspondence received from L&I concerning the visit shall be forwarded to the Engineer.
11. The Contractor shall comply with the Confined Space Entry Requirements found in this Manual.
12. The Contractor shall report all accidents or injuries requiring more than first aid treatment to the Engineer and Construction Safety immediately. A written report shall be submitted within 24 hours, using the Accident Investigation, Equipment & Property Damage Reports, and Near Miss Report forms found in this Manual.
13. Within 48-hours of a Recordable or Lost Work Day Case Injury, incident involving 3rd party, or property damage incident, the Contractor shall meet with the Engineer and Manager of Construction Safety Services. The meeting shall discuss the status of the injured employee, the root cause of the incident, corrective action implemented, the Job Hazard Analysis, and retraining of the employee and supervisor.

14. The Contractor shall complete 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 JHAs are to be reviewed with the workforce and shall contain their signatures as an acknowledgement. It is the responsibility of the Contractor to ensure subcontractors and sub-tiered contractors are completing written JHAs. The Contractor shall use the form provided in this Manual.
15. The Contractor shall submit the names of employees trained in CPR and First Aid to the Engineer.
16. Contractors shall provide appropriate first aid/CPR supplies for their employees and personnel trained to administer first aid/CPR as required.
17. The Contractor shall identify Heat Related Illness Training, outlining program requirements according to WAC 296-62-095.

Contractor Safety Responsibilities

Port of Seattle Construction Accident Investigation Report [2 pages]

PROJECT:
CONTRACT #:
CONTRACTOR:
SUB-CONTRACTOR:

1. **EMPLOYEE'S LAST NAME** **FIRST NAME** **MI** 2. **N/A** **N/A**

3. **OCCUPATION** 4. **APPRENTICE/JOURNEYMAN** 5. **DATE OF INJURY** 6. **TIME OF INJURY**

7. **EXACT LOCATION OF ACCIDENT OR EXPOSURE**

8. **TYPE OF INJURY (ILLNESS) AND BODY PARTS INJURED**

9. **SPECIFIC TASK BEING PERFORMED AT TIME OF ACCIDENT (EX: HOOKING UP OF LOAD, LOADING TRUCK, CHANGING CABLE, ETC.)**

10. **WHAT OCCURRED? DESCRIBE IN SEQUENCE (1) EMPLOYEE'S LOCATION AND POSITION, (2) HOW HE/SHE WAS DOING THE TASK (3) WHAT OCCURRED TO TRIGGER THE ACCIDENT (4) AND IF NECESSARY GIVE BACKGROUND INFORMATION:**

11. **Type Of Accident** ☐ Injury/First Aid ☐ Injury/Recordable ☐ Injury/Lost Time ☐ Property Damage ☐ Third Party ☐ Equipment ☐ Vehicle ☐ Other

12. **Check Cause** ☐ Struck By ☐ Caught Between/Under ☐ Fall Different Level ☐ Exposure To ☐ Hoisting Equipment ☐ Material Handling ☐ Electrical Contact ☐ Fall Same Level ☐ Mobile Equipment ☐ Hand/Power Tool ☐ Other

13. **WHAT CONDITION OF TOOL (S), EQUIPMENT OR JOB SITE CAUSED OR CONTRIBUTED TO THE ACCIDENT? BE SPECIFIC**

14. **WHAT DID THE EMPLOYEE DO OR FAIL TO DO THAT CAUSED OR CONTRIBUTED TO THE ACCIDENT? BE SPECIFIC**

15. **WHAT CAUSED OR CONTRIBUTED TO ABOVE UNSAFE CONDITION? CHECK ALL THAT APPLY.**

16. **WHAT CAUSED OR INFLUENCED ABOVE UNSAFE ACTION(S)? CHECK ALL THAT APPLY.**

Contractor Safety Responsibilities

☐	1. Defective via normal use	☐	9. Weather conditions
☐	2. Defective via abuse/misuse	☐	10. Poor preventive maint.
☐	3. Safety inspection failure	☐	11. Ventilation
☐	4. Poor housekeeping	☐	12. Caused by other employee
☐	5. Poor illumination	☐	13. Caused by employee
☐	6. Faulty design	☐	14. Misconduct of Others
☐	7 Faulty construction	☐	15. Cause other than above
☐	8. Exposure to corrosion		

☐	1. Unaware of Hazard	☐	9. Fatigue
☐	2. Did not know safe procedure	☐	10. "Under the influence"
☐	3. Not properly trained	☐	11. Impaired vision
☐	4. Ignored known hazard	☐	12. Impaired hearing
☐	5. Tried to save time	☐	13. Other physical condition
☐	6. Attitude		
☐	7. Tried to avoid discomfort		
☐	8. Illness influenced action		

17. **WHAT ACTION HAS BEEN TAKEN OR WILL BE TAKEN TO PREVENT RECURRENCE ? (Mark all that apply)**

☐	1. Re-training of person(s) involved	☐	8. Safety guard/device installed	☐	15. Improved illumination
☐	2. Perform Job Safety Analysis	☐	9. PPE required	☐	16. Improved ventilation
☐	3. Discipline of person(s) involved	☐	10. Tool/Equip: repair/replace	☐	17. Standardize job procedure
☐	4. Preventive instruction to others	☐	11. Improve storage	☐	18. Reduction of noise/vibration
☐	5. Job reassignment of employee	☐	12. Eliminate congestion	☐	19. Better prepare for weather
☐	6. Improved inspection procedure	☐	13. Redesign/ Construct		
☐	7. Improve housekeeping	☐	14. Use of proper material		

18. **EQUIPMENT/VEHICLE INVOLVED – DESCRIPTION & UNIT # (IF APPLICABLE):**

19. **EQUIPMENT OR PROPERTY DAMAGE RESULTING:**

20. **DESCRIBE DETAILS OF CORRECTIVE ACTION TAKEN OR PLANNED:**

21**. PERSON RESPONSIBLE FOR PLANNED CORRECTIVE ACTION:**

22. **WITNESS INFORMATION:**

23. **INVESTIGATED BY (SIGNATURE, POSITION, AND DATE)**

_____

24. **REVIEWED AND ACCEPTED BY (SIGNATURE, POSITION, AND DATE)**

_____

Contractor Safety Responsibilities

Equipment, Vehicle, or Property Damage Report [2 pages]

CONTRACTOR: _____ **CONTRACT #:** _____

DATE OF ACCIDENT: _____ **TIME OF ACCIDENT:** _____

LOCATION OF ACCIDENT:_____

_____

_____

EQUIPMENT INVOLVED (Description/Unit #):_____

_____

_____

_____

DAMAGE RESULTING FROM ACCIDENT:_____

_____

_____

_____

WERE THERE PERSONAL INJURIES: **YES:** _____ **NO:**_____

POLICE/FIRE DEPARTMENT REPORT MADE: **YES:** _____ **NO:** _____

WERE PHOTOGRAPHS TAKEN: **YES:** _____ **NO:** _____

ESTIMATED VALUE OF DAMAGE: **$** _____

Contractor Safety Responsibilities

WITNESS TO ACCIDENT: **YES:** _____ **NO:** _____

NAME: _____ **PHONE #:** _____

NAME: _____ **PHONE #:** _____

WEATHER CONDITIONS: _____

REMARKS:_____

_____

_____

_____

RECOMMENDED CORRECTIVE ACTION:_____

_____

_____

_____

IF MORE SPACE IS REQUIRED, USE THE BACK OF THIS FORM FOR ADDITIONAL INFORMATION AND SKETCHES.

SIGNATURE _____

TITLE _____

DATE _____

Contractor Safety Responsibilities

Near Miss Report [2 pages]

INSTRUCTIONS:

If you have witnessed or been exposed to an unsafe condition or event which resulted in no injury ("close call"), please advise your supervisor as soon as possible, and complete this Near Miss Report.

PART I—TO BE COMPLETED BY EMPLOYEE

1. Name_____
First Initial Last

2. Supervisor _____ Supervisor's Telephone Number _____

3. Health and Safety Officer_____

4. Date of Incident _____ Time of Incident_____ am / pm

PART II—NEAR MISS DETAILS (TO BE COMPLETED BY EMPLOYEE)

1. Describe the near miss fully, including what you were doing, specific location of incident, any and all equipment and or chemicals involved_____

_____
_____
_____

2. Were you performing a function of your regular work? Yes _____ No_____
3. Witnesses (Full Names, Home Phone, Work Phone, and Address): (Attach any written statements to this report.)

_____
_____
_____
_____

4. To whom was this incident reported? _____ When Reported?_____
5. What steps were taken to identify the cause of the unsafe condition?_____

_____

6. Was the incident, in your opinion caused by someone other than a company employee? Yes ___ No ___

If yes, explain: _____
_____

7. What steps have been taken to correct the problem or prevent similar occurrences? Indicate date when corrected?

_____
_____

8. What steps have been taken to notify other personnel of the near miss and prevention measures? Indicate date when notified.

_____
_____
_____

9. Employee Signature _____ Date _____
Health and Safety Officer Signature _____ Date _____

PART III—HEALTH AND SAFETY OFFICER TO COMPLETE

1. Do you agree with the employee's description of the incident? If not, explain why? Is there any additional information you can provide to help clarify how this type of situation can be prevented?

_____
_____
_____

2. Signature _____ Date _____

Contractor Safety Responsibilities

Port of Seattle

SITE SPECIFIC PLAN ADDENDUM

Person in charge of reporting hazards and injuries Note that this requires OSHA 10 and complete documented daily inspections	
Phone Number	
Day of Safety Meeting	

Emergency Action Plan
Call 911 and request to be transferred to POS SeaTac Fire Dispatch. For large scale emergency meet at:

Primary		**Secondary**	

JOB HAZARD ANALYSIS WORKSHEET

Job/Operation Title		**Location / Address**	
Date		**Work Order #**	
Analysis Made By		**Contact Person**	
Analysis Reviewed By		**Contact Person Ph #**	
Location of Master Prevention Program			

Sequence of Basic Job Steps	Potential Hazards/Ergonomics	Recommended Safe Job Procedures & Required PPE

Supervisor Signature: _____ **Received by RE/CM:** _____

In the event of an injury or accident, please notify Alan Norris at 206-484-9251.

Contractor Safety Responsibilities

*** List Chemicals to be used on the project. Are the Material Safety Data Sheets attached? Physical MSDS must be on-site.
*** NOTE: A Chemical Exposure Plan for any products containing isocyanates, methylene chloride, Hydrofluoric Acid, lead, silica and processes involving floor sealers, traffic coatings, terrazzo sealers or specialty paints. The plan shall include employee exposure control methods, isolation methods to prevent spread of chemicals outside the work area and safeguarding of the public.

Will the Scope of Work consist of the following tasks? (check all that apply)			
	Traffic control*		Confined Space Entry*
	Welding, Cutting, Grinding*		Heavy Equipment
	Trenching or Excavation*		*** Flammable or Combustible materials
	Carpentry		Steel Erection*
	*** Painting, Staining, Sealant*		Ladder or Scaffold work
	Demolition*		Roofing
	Energized Electrical*		Regulated Materials
	Use of a Crane/Boom/Hoisting		Hazardous Materials
	Work from heights of 6' or greater*		Conveyors*
* Requires additional paperwork – checklists, plans, permits, shut-down notice, etc.			

Description of public protection measures ("Public" is defined as anyone not associated with the project - general public, POS, Tenant, and Airline Employees):

Employee disciplinary for non-compliance with set forth safety policies and procedures will be consistent Port of Seattle's disciplinary action matrix, as described within your site-specific safety plan and site-specific orientation. Sign up:

Print Name	Signature

Employee Safety Committees

A. Scope

This section defines the minimum requirements for the formation and operation of safety committees on the Port of Seattle Construction Project.

B. Purpose

The dissemination of safety related material from the Contractor to their employees and those of their subcontractors and sub-tier with the aid and benefit of the Trade Union representatives and Port Safety staff.

C. Reference

WAC 296-800-130

D. Employee Safety & Health Committee

Employee Safety Committees are an effective tool for managing and furthering the promotion of workplace safety. Any employer with eleven or more employees shall have a designated safety committee composed of employer-selected and employee elected members. The tenure of those selected and elected employees shall be one (1) year maximum. The number of employees elected and the number of employees selected shall be equal in number. The committee shall have an elected chairperson. Should a vacancy occur on a committee, a new member would be elected or selected prior to the next scheduled meeting.

The Safety Committee shall meet on a monthly basis at a date, hour, and location within reason, identified by the committee. The length of the meeting should not exceed one (1) hour. Minutes of each committee meeting and the names of those attending shall be documented and filed for a period of at least one (1) year and shall be made available for review.

Safety and Health Committee shall address the following:

1. A review of safety and health hazards as listed on inspections.
2. Evaluation of accident investigations to determine if the cause of the unsafe act or condition was properly identified and abated.
3. These meetings shall be held on a monthly basis to discuss safety issues that have arisen.

NOTE: All employers of ten or less employees and employers of eleven or more employees having work on separate shifts may elect to have supervisor-crew safety meetings in lieu of a Safety and Health Committee.

Safety Orientation & Training

A. Scope

This section defines the minimum safety training requirements for all Contractor personnel working on the Port of Seattle Construction Project.

B. Purpose

To inform Contractor employees and their subcontractors of safety & health rules and regulations.

C. Reference

29 CFR Part 1926, WAC 296-155, WAC 296-800, ANSI, NFPA, FAA, POS FD.

D. Safety Orientation

1. All Contractor and Consultant personnel working on the Port of Seattle construction projects shall receive a site safety orientation prior to commencing work. Attendees will receive a safety handbook and be apprised of site-specific safety procedures and the **Zero Accident/Injury** goal of the POS. Orientations for off-shift work can also be scheduled by contacting the POS Construction Safety Services office at (206) 787-7936.
2. The Prime Contractor shall orientate employees and Sub-tiered Contractor employees to the specific rules found in their site-specific safety & health plan.

E. Safety Training

1. The Contractor shall provide basic safety training as well as refresher training to employees in reference to OSHA, WAC, and Port of Seattle Construction Project requirements. Review listing of safety training required by OSHA for the construction industry. It is the responsibility of the Contractor to maintain detailed records of training for their employees. It is also the responsibility of the Contractor to ensure that safety rules, procedures, and requirements are effectively conveyed to non-English speaking personnel.
2. Contractor shall ensure that sub-tiered contractors perform this training also.

F. Contractor Safety Representative Meeting

1. It is a requirement of 01 35 29 – Safety Management that the Contractor's Site Safety Representative attend the monthly Contractor Safety Representative Meeting scheduled by the Manager of Construction Safety Services. This meeting is held to discuss and resolve relevant issues related to safety and health on POS construction projects. If the Contractor's Safety Representative cannot attend this meeting, they shall send a designee in their place.
2. It is the responsibility of the Contractor Safety Representative to review the pertinent information from this meeting at their worksite.

Safety Orientation & Training

Construction Industry Training Requirements OSHA 1926 Federal [2 pages]

Training Requirements	OSHA Reference	Certification Required?	Minimum Training Frequency
Accident Prevention: Qualified Operators	CFR-1926.20 (b) (4)		
Safety Training and Requirements.	CFR-1926.21 (b)		
Access to Employee Exposure & Medical Records	CFR-1910.1020(b)(3)		Upon employment, annually thereafter
Employee Emergency Action Plans	CFR-1926.35(e)		Upon development of plan, then when responsibilities or plan changes
First Aid/CPR	CFR-1926.50(c)	yes	Consistent with First Aid/CPR program requirements
Ionizing Radiation	CFR-1926.53		
Non-ionizing Radiation	CFR-1926.54 (a) & (b)	yes	
Ventilation: Open Surface Tanks	CFR-1926.57(i)(9) (i)		
Hazard Communication	CFR-1910.1200		At the time of initial assignment, then whenever new hazards are introduced
Lead	CFR-1926.62		Prior to initial assignment, then annually (for employees exposed at or above the action level)
Process Safety Management of Highly Hazardous Chemicals	CFR-1926.64(g) & (h)	yes	Upon initial assignment, then every 3 years
Hazardous Waste Operations & Emergency Response	CFR-1926.65(b)(1)(iv	yes	Upon initial assignment, annually thereafter
Respiratory Protection	CFR-1910.134		Prior to use and then at least annually
Fire Protection: Fire Brigades	CFR-1926.150 (a)(5)		
Powder Actuated Tools	CFR-1926.302 (e) (1)	yes	
Welding: Fuel Gas	CFR-1926.350 (d)		
Welding: Arc Welding and Cutting	CFR-1926.351 (d)		
Welding: Fire Watch	CFR-1926.352 (e)		
Scaffolding: Aerial lifts	CFR-1926.453 (b)(2)(ii)		
Scaffolding: Employees Working on Scaffolding	CFR-1926.454 (a), (c)	*yes*	Upon initial assignment, then when equipment changes and as needed to maintain proficiency
Scaffolding: Erection Crews	CFR-1926.454 (b), (c)	yes	Upon initial assignment, then when equipment changes and as needed to maintain proficiency

Safety Orientation & Training

Training Requirements	OSHA Reference	Certification Required?	Minimum Training Frequency
Fall Protection	CFR-1926.503	yes	Upon initial assignment, then when equipment changes and as needed to maintain proficiency
Powered Industrial Trucks (Forklifts)	CFR-1926.602 (d)	yes	Prior to use, then at least every 3 years, or after accident or near miss, or unsafe operation or different type of truck
Steel Erection*	CFR-1926.761		
Underground Construction	CFR-1926.800(d), (g)(5)(iii & v)		Annually
Power Transmission and Distribution: Emergency Procedures	CFR-1926.950 (e)		
Stairways & Ladders	CFR-1926.1060		Prior to use, thereafter sufficient to maintain understanding & knowledge
Asbestos	CFR-1926.1101		Upon initial assignment, annually thereafter
Benzene	CFR-1910.1028		Upon initial assignment, annually thereafter
General Industry Standards:			
Permit Required Confined Spaces	CFR-1910.146	yes	Prior to use, thereafter when change in duty or deviation from procedures occurs , and with sufficient frequency to maintain understanding & knowledge
Lock-out/Tag-out of Hazardous Energy	CFR-1910.147(c)(7)	yes	Upon initial assignment, with changes in job assignment or new hazards are introduced for authorized & affected employees, and sufficient frequency to maintain understanding & knowledge thereafter
Portable Fire Extinguishers	CFR-1910.157(g)		Upon initial assignment, annually thereafter
Employee Alarm Systems	CFR-1910.165(b)(4)		
Bloodborne Pathogens	CFR-1910.1030(g)(2)		Upon initial assignment, annually thereafter

**Standard currently on hold.*

Safety Orientation & Training

Construction Industry Competent Person Requirements OSHA 1926 Federal

Competent Person Requirements	OSHA Reference	Name of Competent Person	Verification Required
Accident Prevention	CFR-1926.20 (b) (2)		
Ionizing Radiation	CFR-1926.53 (b)		
Gases, Vapors, Fumes, Dust, and Mists	CFR-1926.55 (b)		
Hearing Protection	CFR-1926.101 (b)		
Rigging Equipment	CFR-1926.251 (a)(6)		
Welding: Preservative Coatings	CFR-1926.354 (a)		
Assured Grounding Program	CFR-**1926.404(b)(1)(iii)(B)**		
Scaffolding	CFR-1926.451 (b)(10&11), (d) 10&18),(e)(9)(i), (f)(3,7,12), (g)(2)		
Fall Protection	CFR-1926.502 (c)(4)(ii), (d)(19), (h)(1)(i), (k)(4) and .503(a)(2)		
Cranes and Derricks	CFR-1926.1501		
Excavations	CFR-1926.651 (c)(1)(i), (h)(2-3), (k)(1); .652(a)(1)(ii), (d)(3)		
Steel Erection*	CFR-1926.753(c)(1,2), .754(d)(1), .755(a)(4), .756(a)(2), .757(a)(2,4), .761(a)		
Underground Construction	CFR-1926.803		
Demolition	CFR-1926.850(a), .852(c), .859(g)		
Asbestos	CFR-1926-1101		
General Industry Standards:			
Slings	CFR-1910.184(d), (e)(3)(i-iii)		

Basic Safety Rules

All Contractors under contract with the Port performing construction or construction related activities on the Port of Seattle Construction Project are responsible for compliance with site safety policies/procedures and are directly responsible for the safety of their employees and those of their subcontractors. General responsibilities include:

A. The Contractor shall permit only qualified, trained personnel to operate aerial lifts, forklift, or motorized equipment and machinery.

B. Ladders shall be properly constructed and kept in good repair. They shall be the proper length and type for the 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 296-155-400)

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 equipment, shall be made without the manufacturers or professional engineers written approval.

G. Proper lighting and illumination of work areas shall be provided.

H. Employees shall avoid working, driving, or walking under suspended loads.

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. Post, observe, and comply with Safety, Danger, Warning, and Caution tags or signs. Tags and signs shall not be removed unless authorized.

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

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

M. All Contractors shall submit a Safety Data Sheet (SDS) on any hazardous substance brought onto Port property. Prior to bringing materials on site, the SDSs shall be submitted to the Engineer for review and documentation purposes, as specified in

N. 01 57 23 – Pollution Prevention, Planning and Execution. The SDSs shall be the most current edition but no more than 3 years old.

O. Locate utilities prior to the start of any work.

P. Traffic control and the use of flaggers shall 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. Contractors shall maintain records of flagger certifications.

Q. Firearms are strictly forbidden on the project.

R. The use of AM/FM radios, CD or tape players is prohibited along with the use of personal headsets.

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

T. Glass bottles are prohibited on the project.

U. Graffiti of any type will not be tolerated on the project in conjunction with the Port's Zero Tolerance Policy.

V. SEAPORT PROJECTS: The following basic safety rules shall apply to operations involving transferring to and from boats, barges, and floating platforms. Transferring between boats, barges and floating platforms can be dangerous, particularly in rough weather. Be extremely cautious each and every time you make a transfer. Never become complacent about this. Getting caught between vessels, even in calm seas, can be deadly.

1. Boat captain alert to move boat or to keep from crushing anyone in water.
2. Only one designated person to give orders for boat movement.
3. Man overboard to swim in a direction to clear boat and platform. Then swim to nearest climb-out point.
4. Do not ever fight a current.
5. Life ring with line attached to be standing by close to point of departure from boats.
6. Hold on to swing rope high enough up to ensure clearing boat landing.
7. Use rope with a knot whenever available to prevent hands from slipping.
8. Use both hands.
9. Never attempt to carry anything.
10. Time your swing to leave the boat when it is on the peak of a wave.
11. Deck personnel on both vessels must assist in making transfers.
12. Transferring personnel must all wear life jackets.
13. Do not hurry transfer. Take your time!
14. Bring vessels together side to side, bow to stern.
15. Be prepared to stow or lash equipment/material after completion of transfer.

Personal Protective Equipment

A. Scope

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

B. Purpose

To reduce or eliminate the potential of injury to Contractor employees and visitors performing work on the Port of Seattle construction projects.

C. Reference:

29 CFR 1926 Subpart E Personal Protective and Life Saving Equipment, WAC 296-155-17615, WAC 296-800-160 Fall Protection, WAC 296-24-980, Hearing Conservation and Fall Protection sections of 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 Contractors, 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 to include reaming, drilling, welding and cutting. The use of a face shield does not preclude the requirement to utilize eye protection under it. Eye and face

protection equipment shall meet the requirements specified in American National Standards Institute, Z87.1-2003.

3. 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: Footwear appropriate for the task may be worn during performance of the task; i.e.: rubber boots during concrete placement or wet muddy conditions.

4. 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 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. The Contractor shall have 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. 100% fall protection shall be utilized when working from all unprotected 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.

NOTE: Refer to OSHA letter of interpretation (1926.106, 9/28/1999) for Fall Protection Requirements Over Water. Other specific fall protection requirements can also be found within this Manual.

7. All employees working on the 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. Personnel utilizing chain saws shall wear eye, face, hearing, and leg protection.

9. Contractor 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.

10. Contractor personnel shall wear personal floatation device within 6' of any exposure to falling into water where the potential for drowning exists.

E. Appropriate Project Attire

The following minimum dress requirements apply to all employees, Contractors, Subcontractors, Vendors, and Visitors.

1. Tank tops, net shirts, cut-off shirts, or sleeveless shirts may not be worn. 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.

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

4. Employees that 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.

5. Jewelry should be discouraged from being worn while working.

F. 100% Glove Policy

To reduce the possibility of hand injuries, the Contractor shall ensure that all employees working under their control, including subcontractors and sub-tiers, utilize gloves while working on Port Construction Projects. It is the responsibility of the Contractor to supply the proper glove for the task and train the employees in relation to WAC 296-800-16065. When the Contractor feels a greater risk of injury is imposed by the use of gloves, or the glove may require modification to perform a given task, it shall be documented on the Job Hazard Analysis form. Final selection of the best hand protection is the responsibility of the Contractor.

NOTE: A sample guide for the selection for gloves on pages 32-33.

Personal Protective Equipment

G. Personal Protective Equipment Assessment

The Contractor shall submit a written Personal Protective Equipment Assessment for work performed on the project. Reference pages 34-35.

NOTE: The personal protective assessment could be incorporated within the Job Hazard Analysis if each task is specific task is specific to required PPE for that task.

NOTE: The personal protective assessment form may be incorporated within the JHA to identify specific PPE required for the task(s).

Personal Protective Equipment

Glove Guide [1/2 pages]

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 Nitrile (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		■	■						
Placing Mesh		■							
Placing Rebar		■							
Planning				■					
Post Driving	■	■							
Powder Actuated Gun		■		■					
Saw Cutting		■	■	■					

Glove Guide [2/2 pages]

Personal Protective Equipment

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 Nitrile (Med)	Cowhide Welders
Scaffold Erection	■								
Screws/Fasteners		■							
Sealing/Caulking					■			■	
Setting Tile		■						■	
Sheet Metal			■						
Shoveling	■								
Spreading	■								
Stapling			■						
Stone Setting		■							
Sweeping	■	■							
Surveying							■		
Troweling								■	
Welding									■
Wiring		■	■		■				

Personal Protective Equipment

HAZARD ASSESSMENT FORM PAGE 1

I am reviewing (check the appropriate box):	❑ A worksite	Specify location:
	❑ A single employee's job description	Name of employee:
		Working title of position:
		Position Number:
	❑ A job description for a class of employees	Working title of positions:
		Position Number(s):

Your name:	**DEPARTMENT:**	**Date:**

EYE HAZARDS (Appendix B). Tasks that can cause eye injury include: working with chemicals or acids; chipping, sanding, or grinding; welding; furnace operations; and, metal and wood working.

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Chemical Exposure	Yes ❑	No ❑		
High Heat/Cold	Yes ❑	No ❑		
Dust/Flying Debris	Yes ❑	No ❑		
Impact	Yes ❑	No ❑		
Light/Radiation	Yes ❑	No ❑		

HEAD HAZARDS (Appendix C). Tasks that can cause head injury include: working below other workers who are using tools or materials that could fall; working on energized electrical equipment or utilities; and, working in trenches or confined spaces.

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Impact	Yes ❑	No ❑		
Electrical Shock	Yes ❑	No ❑		

FOOT HAZARDS (Appendix D). Tasks that can cause foot injury include: exposure to chemicals or acids; welding or cutting; foundry operations; materials handling; renovation or construction; electrical work; and, spray finishing or other work with flammable or explosive materials.

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Chemical Exposure	Yes ❑	No ❑		
High Heat/Cold	Yes ❑	No ❑		
Impact/Compression	Yes ❑	No ❑		
Slips/Trips	Yes ❑	No ❑		
Puncture	Yes ❑	No ❑		
Slippery/Wet Surfaces	Yes ❑	No ❑		
Explosive/Flammable Atmospheres	Yes ❑	No ❑		
Electrical	Yes ❑	No ❑		

Personal Protective Equipment

HAZARD ASSESSMENT FORM PAGE 2

HAND HAZARDS (Appendix E). Hand injury can be caused by: work with chemicals or acids; exposure to cut or abrasion hazards (for example, during demolition, renovation, or woodworking); and, work with very hot or cold objects or materials. BLOODBORNE PATHOGENS – ADDITIONAL TRAINING/MONITORING IS REQUIRED!

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Chemical Exposure	Yes ❑	No ❑		
High Heat or Cold	Yes ❑	No ❑		
Cuts/Abrasion	Yes ❑	No ❑		
Puncture	Yes ❑	No ❑		
Electrical Shock	Yes ❑	No ❑		
Bloodborne Pathogens (see Appendix E)	Yes ❑	No ❑		

BODY/TORSO HAZARDS (Appendix F). Injury of the body or torso occur during: exposure to chemicals, acids, or other hazardous materials; abrasive blasting; welding, cutting, brazing; chipping, sanding, or grinding; use of chainsaws or similar equipment; foundry operations; and, work around electrical arcs.

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Chemical Exposure	Yes ❑	No ❑		
Extreme Heat/Cold	Yes ❑	No ❑		
Abrasion	Yes ❑	No ❑		
Impact	Yes ❑	No ❑		
Electrical Arc	Yes ❑	No ❑		

FALL HAZARDS (Appendix G). Personnel may be exposed to fall hazards when performing work on a surface with an unprotected side or edge that is 6 feet or more above a lower level, or 10 feet or more on scaffolds. Fall protection may also be required when using vehicle manlifts, elevated platforms, tree trimming, performing work on poles, roofs, or fixed ladders. ADDITIONAL TRAINING/MONITORING IS REQUIRED!

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Fall hazard	Yes ❑	No ❑		

NOISE HAZARDS (Appendix G). Personnel may be exposed to noise hazards when machining, grinding, sanding, using pneumatic equipment, generators, motors, jackhammers, or similar equipment. ADDITIONAL TRAINING/MONITORING IS REQUIRED!

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Noise hazard	Yes ❑	No ❑		

RESPIRATORY HAZARDS (Appendix G). Personnel may be exposed to respiratory hazards that require the use of respirators: when using certain chemicals outside of chemical fume hood; when applying paints or chemicals in confined spaces; when welding, cutting, or brazing on certain metals; and, when disturbing asbestos, lead, silica, or other particulate hazards. ADDITIONAL TRAINING/MONITORING IS REQUIRED!

Check the appropriate box for each hazard:			*Description of hazard(s):*	*Based upon the hazard assessment, the following PPE is required:*
Chemical exposure	Yes ❑	No ❑		
Confined space work	Yes ❑	No ❑		
Particulate exposure	Yes ❑	No ❑		
Welding/related hazard	Yes ❑	No ❑		

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on this date (signature)

_____

A. Scope

This section defines the minimum safety requirements for Contractors who use, handle[PoSU1], or store hazardous materials.

B. Purpose

The purpose of the Hazard Communication Program is to inform Contractor employees as well as employees of other Contractors of workplace chemical hazards including the labeling system and use of Safety Data Sheets (SDS[PoSU2]).

C. Reference

29 CFR Part 1926.59, WAC 296-155-180 & WAC 800-170 or WAC 296-901 Globally Harmonized System For Hazard Communication[PoSU3].

D. General

1. The Contractor shall:
   a. The Contractors shall: Develop a site-specific hazard communications program.
   b. Maintain a master list of chemicals that are approved for use on the project.
   c. Procure and maintain SDS[PoSU4] for all applicable chemicals, materials, or substances available for use at the work site.
   d. Review SDS[PoSU5] for significant health and safety information.
   e. Make SDSs[PoSU6] available for all employees to review during all the work shifts.
   f. Provide hazard communication training to employees at time of hire and repeat when new chemicals are introduced on the project.
   g. Inform site personnel of possible hazardous exposures of chemicals in use.
   h. Provide notification to adjacent workers and businesses using a “Construction Advisory Form” 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 Contractor. This includes but is not limited to dust, fumes, liquids, mists, and vapors.
   j. Provide PPE appropriate for the hazards listed and train employees in the proper use of PPE.
   k. Provide proper labeling of containers including secondary containers.
   l. Handle, store, and dispose of chemicals appropriately.

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

Airport: Immediately notify the following

1. Fire Dispatch	(206) 787-4653
2. Sarah Kittleson Cox[PoSU7]	(206) 787-7137

Seaport: On Water

1. U.S. Coast Guard	(206) 220-7221
2. Seaport Resident Engineer[PoSU8]	
3. POS Environmental	(206) 787-3763
	(206) 390-4942 cell

Seaport: On Land

1. Seaport Resident Engineer[PoSU9]	
2. POS Environmental	(206) 787-3763
	(206) 390-4942 cell

2. Program Elements[PoSU10]

a. Chemical Inventory List

The Contractor shall be responsible for preparing Chemical Inventory Listings of all chemicals to be brought on and used on the project.

The Contractor will use the following criteria to determine if chemicals in use on Port of Seattle Construction Projects fall under the Hazard Communications Standard, and hence should be on an inventory list.

i. Any substance that have permissible exposure limits (PEL) under the Washington Industrial Safety and Health Act (WISHA) in Chapter 296-62-075 and 296-841 Airborne Contaminants[PoSU11].

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.

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. Chemical Inventory Lists:
   i. Must be updated as new substances are added or deleted.
   ii. Must correspond to SDS[PoSU12] (for each chemical, material, or substance) that are kept on file and available for employees.
   iii. Must be forwarded to the Engineer for review and compilation of a master list.

c. Container Labeling
   i. All containers of chemicals must retain the original label and information provided from the manufacturer or distributor.
   ii. Contractors shall verify that all containers received for use are clearly labeled as to:
   iii. The identity of the hazardous chemical.
   iv. Appropriate hazard warning (CAUTION, WARNING, or DANGER written on the label to indicate a chemical is hazardous).
   v. Name and address of the manufacturer.
   vi. All secondary or other containers that chemicals are transferred to shall 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”.
   vii. The labels shown following this section are examples of appropriate secondary container label for use on Port of Seattle Construction Projects. 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, oilcan, etc. Entering the following information completes the label.

d. Chemical Name
   i. Enter the name of the chemical.

e. Hazard Rating
   i. Enter the Health, Flammability, and Reactivity hazard numbers. They are normally found on the SDS[PoSU13]. These hazard ratings are a number from 0-4. An explanation of the hazard rating is shown in the bottom left hand corner of the label. A more detailed explanation of ratings for each of the types of hazards will follow.

"Health" Hazard Rating Definitions

0		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.

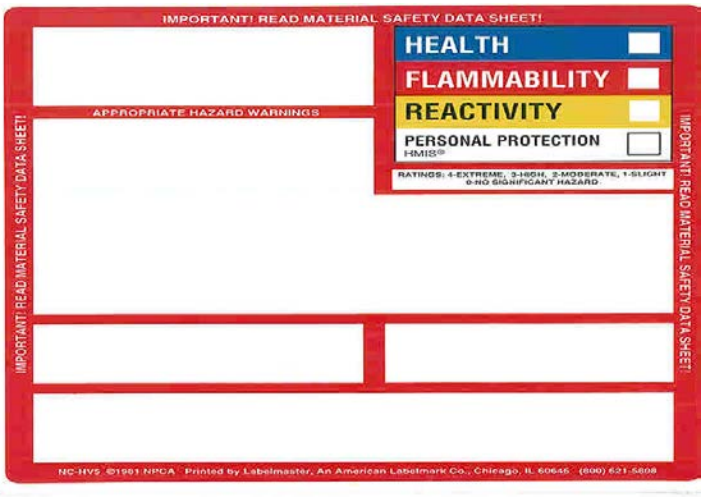
"Flammability" Hazard Rating Definitions

0	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. Safety Data Sheets (SDS[PoSU14])

   SDSs[PoSU15] provide pertinent information about hazardous substances, such as chemical composition, effects of exposure (via handling, storing, using or transporting), protective measures, and emergency procedures. An SDS[PoSU16] must be provided, free of charge by the manufacturer or distributor, of any hazardous substance. These sheets must be acquired and maintained in an area that allows free access, 24 hours a day, by anyone potentially exposed to any hazardous substance in the work place.

   SDS[PoSU17] is to be archived for at least 30 years beyond the last known use or potential exposure to the substance to which they pertain.

5. Hazardous Non-Routine Tasks

   Employees are periodically required to perform hazardous non-routine tasks. Some examples of non-routine tasks include confined space entry, line breaking, and tank cleaning. Prior to starting work, each affected employee will be given information by the Contractor concerning 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 work, the Contractor shall provide training where the potential for exposure to hazardous substances exists. The training shall include:

   i. Physical and health risks of the hazardous chemical.
   ii. Symptoms of overexposure.
   iii. How to determine the presence or release of hazardous chemicals in the work area, and awareness of substances being used by others.

iv. How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, personal protective equipment, and emergency response.
v. Procedures to follow if employees are overexposed to hazardous chemicals.
vi. How to read labels and SDSs[PoSU18] to obtain hazard information.
vii. How to label secondary containers.
viii. The importance of returning unused substances to original containers to limit the number of containers of hazardous chemicals.
ix. Proper methods for disposal of hazardous chemicals.
x. Location of SDS[PoSU19].
xi. Requirements of the WISHA Hazard Communication Standards.

7. Application of Floor Sealers, Specialty Paints, Traffic Coatings and Epoxies

To reduce the potential impact to Port and/or tenant operations, traveling public, and workers during such applications, the following procedures shall be followed when Contractor's operations require the use of sealers, coatings, and specialty paints:

a. A complete Chemical Inventory list is required to be submitted by each Contractor. The Hazard Communication Standard or "Right –To-Know Law" covers this under Federal, State and project specifications. The Chemical List is usually submitted during the submittal process but may need to be updated during the project as operations and scope of work are more clearly identified.

b. Any products containing Isocyanates, Methylene Chloride, work processes identified involving floor sealers, traffic coatings, terrazzo sealers, specialty paints (non-latex, epoxy) or any product that SDS[PoSU20] ingredient percentages are not represented or incomplete should be "flagged" for further discussion in regard to safety & health impacts.

c. When the use of such products is identified, it shall be brought to the attention of the safety department for further investigation. At this point, the Contractor's[PoSU21] Industrial hygienist (IH) shall be contacted for assistance and discussions with the Engineer in regard to the work.

d. These sealers or paints may need to be applied during "off-shift" hours to mitigate the impact to tenants or the public.
e. The Contractor shall construct dust, fume, mist, vapor and smoke-proof enclosures to separate the work area from the central HVAC system and the public whenever welding, dust, or vapor generating activities are

taking place. All outlets and paths for air return to the central HVAC system or public access shall be sealed with plastic to prevent recirculation of contaminated air. The Contractor shall provide temporary ventilation to remove objectionable vapors and dust from with the enclosure. The temporary ventilation shall not discharge within the terminal building or near HVAC intakes.

f. A pre-work meeting shall be held in advance of the application of the product (s). At this meeting the following items shall be discussed:
   i. The most current [PoSU22]Safety Data Sheet(s) for the product(s) to be applied.
   ii. Chemical contents of the product(s) listed on the SDS[PoSU23] in regard to health risks.
   iii. The type of containment and ventilation for the work including the number of air changes required and how and where the off gases will be vented. The Boiler Shop should be contacted to verify any ventilation issues regarding the terminal intakes.
   iv. Any concerns raised by the Port of Seattle Fire Department in regard to the products flammability, reactivity, explosiveness, or bulk storage.
   v. Personal Protective Equipment (PPE) required with an emphasis on respiratory protection (cartridge or supplied air), along with hand, face and eye protection.
   vi. Training records to include Hazard Communication and respiratory protection.
   vii. First Aid/CPR and emergency procedures.
   viii. "Historical Data" in regard to past applications. Conditions such as quantity supplied, air temperature, time of year, location and air-monitoring sampling may be factors.
   ix. Possible impacts to tenants, the public, and other Contractors.
   x. The completed Job Hazard Analysis (JHA) for the operation.
   xi. Quality Assurance that the product delivered is the product specified.

8. Chemical Substitution
   With the assistance of the Industrial Hygienist and the Engineer it may be possible to substitute a less hazardous product than the one proposed for use.

Due to regulatory changes, on or before June 1, 2015:

Material Safety Data Sheets (MSDS) will become Safety Data Sheets (SDS)

- SDS serve the same purpose as MSDS
- SDS will be in a uniform format and easier to read

Labels on hazardous chemicals will include:

- Signal words: "Warning" (less serious risk) or "Danger" (more serious risk)
- New Label Format
- Precautionary statements (what should you do to protect yourself from the hazard?)
- Hazard statements (what is the hazard?)
- Pictograms which visually identify the main hazards

HAZARD COMMUNICATION: SIGNAL WORD

Pay attention to the Signal Word on the new labels!

- The Signal Word ("**Warning**" or "**Danger**") is determined by the level of risk for each chemical on each hazard.
- For example, if a chemical is labeled as a Health Hazard and the hazard statement indicate that it is a carcinogen…
- "**Warning**" means the substance "is suspected of causing cancer"
- "**Danger**" means the substance "may cause cancer" (in other words, there is more scientific evidence that the chemical will cause an increased risk of cancer if used improperly).

Either way, WARNING or DANGER
Always follow the proper precautions!

New Label Format (SAMPLE ONLY)

SAMPLE LABEL

CODE _____
Product Name_____

Product Identifier

Company Name_____
Street Address_____
City_____ State_____
Postal Code_____Country_____
Emergency Phone Number_____

Supplier Identification

Hazard Pictograms

Signal Word
Danger

Keep container tightly closed. Store in a cool, well-ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measures against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon Dioxide (CO_2) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.

Precautionary Statements

Highly flammable liquid and vapor.
May cause liver and kidney damage.

Hazard Statements

Supplemental Information

Directions for Use

_____
_____
_____

Fill weight:_____ Lot Number:_____
Gross weight:_____ Fill Date:_____
Expiration Date:_____

Uniform Format - Safety Data Sheet

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage list precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity list chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment.

Section 13, Disposal considerations provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices.

Section 14, Transport information provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.

Section 15, Regulatory information identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS.

Section 16, other information, includes the date of preparation or last revision.

Nine New Hazard Communication Pictograms

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Flame

- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self-Reactives
- Organic Peroxides

Exclamation Mark

- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (Non-Mandatory)

Gas Cylinder

- Gases Under Pressure

Corrosion

- Skin Corrosion/Burns
- Eye Damage
- Corrosive to Metals

Exploding Bomb

- Explosives
- Self-Reactives
- Organic Peroxides

Flame Over Circle

- Oxidizers

Environment

(Non-Mandatory)

- Aquatic Toxicity

Skull and Crossbones

- Acute Toxicity (fatal or toxic)

Fire Protection

A. Scope

This section defines the minimum requirements for fire prevention and protection on Port of Seattle Construction projects.

B. Purpose

To minimize the possibility of personal injury, property damage, and schedule impacts to Contractor's personnel or those utilizing the Port facility.

C. Reference

29 CFR Subpart F & Subpart J, WAC 296-155 Part D & H, NFPA, Cutting & Welding, Flammable & Combustible Liquids and Portable Heaters sections of this Manual.

D. Definitions

Flame Resistant – Means so resistant to fire that, for specified time and under 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

The Contractor shall be responsible for development and implementation of a fire protection and prevention program to be followed throughout all phases of construction.

1. Specific fire protection plans will be prepared for each project and include:
    a. Provisions for adequate exits via stairs or ladders, etc., in case of an emergency.
    b. Specific locations for fire extinguishers in accordance with WAC requirements.
    c. Provisions for inspection and replacement of fire extinguishers located in the work area.
    d. Proper storage of flammable and combustibles.
    e. Maintained vehicle access.
    f. Use of noncombustible panels, paint, flame resistant tarpaulins or approved material of equivalent fire retardant characteristics for the construction of temporary barricades.

F. Fire Extinguishers

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 and no more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.
7. Employees shall be trained annually in their use.

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 the Port of Seattle Seaport Maintenance through the Resident Engineer. An interim plan shall be formulated for these service disruptions.
2. Until the permanent system is operating, a communication program alerting employees to an emergency shall be in place. This plan will include an alarm such as a siren or air horn.
3. Priority should be given to activation of the building standpipe system.
4. Priority shall be placed on installing and activating the permanent fire protection system.
5. Nothing shall be secured to any part of the building's fire suppression system.

Cutting & Welding

A. Scope
This section defines minimum safety requirements to be followed by the Contractor when, welding, cutting, and storing compressed gas cylinders on Port of Seattle Construction projects.

B. Purpose
To eliminate the potential for fire, explosion, injury, impacts to the general public, the facility or property damage.

C. Reference
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), WAC 296-24-68203, WAC 296-155 Parts C, D, & H, NFPA, Port of Seattle Fire Department Construction Standards, Flammable & Combustible Liquids and Hot Work section of this Manual.

D. Definitions:

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

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

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

E. General
Welding and Cutting

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. Oxygen 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

Flammable & Combustible Liquid

A. Scope
This section defines the minimum safety requirements for the use and storage of flammable and combustible liquids on the Port of Seattle Construction projects.

B. Purpose
To prevent injury to personnel or the general public due to fire or smoke damage in the facility.

C. Reference
29 CFR Subpart F & J, WAC 296-155 Part D & H, NFPA, and Fire Protection section of this Manual.

D. Definitions

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.

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

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 do not 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 shall be stored, handled, and piled with due regard to fire characteristics.
5. Fuel and oil spills shall be promptly cleaned up.

6. Warning signs prohibiting smoking and open flames shall be posted, maintained, and enforced 25 feet around storage areas for fuel and other flammable and combustible materials.
7. All sources of ignition shall be prohibited in areas where flammable liquids are stored, handled, and processed. Suitable “No Smoking” signs shall be posted throughout such areas.
8. Flammable or combustible liquids shall not be stored in any enclosed building without approval of the Port of Seattle Fire Department (or Seattle Fire Department for seaport), Facility Management and Construction Safety. Upon Fire Department 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 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 Seattle Fire Department, Facility Management and Construction Safety.
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 and no more than 25 feet from any Class I or Class II liquid storage area located outside of a storage room but inside a building.
14. Flammable liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floor plate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of this section shall be deemed to have been complied with.

F. Paints and Painting (Flammable)
   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 NFPA recommendations.
   2. 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.
   3. Paint-soiled clothing and drop cloths, when not in use, shall be stored in well ventilated, self-closing steel cabinets or containers.

4. Paint scrapings and paint-saturated debris shall be removed daily from the premises. Off-site disposal shall be the Contractor's responsibility and performed in accordance with all applicable laws and regulations.
5. Ventilation adequate to prevent the accumulation of flammable vapors to hazardous levels shall be provided in all areas where painting is done or paints are mixed.
6. Smoking, open flames, exposed heating elements, or other sources of ignition shall not be permitted in areas or rooms where spray painting is being conducted.
7. Spray paint hoods, respirators, and other clothing or equipment shall be in accordance with recommendations of NFPA.
8. For additional information please refer to the section for Hazard Communication in this Manual in regard to the application of floor sealers, specialty paints, traffic coatings and epoxies.

Fall Protection

A. Scope
This section defines the minimum safety requirements for Contractor personnel while performing work from heights greater than four feet on the Port Construction Projects.

B. Purpose
To prevent injury to employee exposed to falls while performing work from heights such as steel erection, concrete forming, accessing work areas or walking working surfaces. Falls are ranked as the leading cause of death and serious injury in construction. When Contractor employees are exposed to a fall hazard of four (4) feet or greater, 100% fall protection shall be insured. This can be accomplished through the use of fall arrest systems or fall restraint systems including guardrail systems.

C. Reference
29 CFR 1926 Subparts E & M, OSHA Standard Interpretation or near water, WAC 296-155 Parts C & C-1, ANSI A10.32-2004, and the PPE, Floor & Wall Openings and Ladders & Stairways sections of this Manual.

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

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.

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.

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.

Catch Platform - A type of fall arrest system that consists of a platform installed within four vertical feet of the fall hazard, is at least forty-five inches wide and is equipped with a standard guardrail system on all exposed sides. Catenary Line – See horizontal lifeline.

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.

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 carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).
Control Zone – The area between the warning line system and unprotected sides and edges of the walking/working surface.

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.

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 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.

Drop Line – A vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device. Failure – Load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

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.

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 246-155-24611(2)

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.

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

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

Free Fall Distance – The vertical displacement of the fall arrest attachment point on the employee's 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.

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

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.

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

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.

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.

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.

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

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

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).

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

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

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.

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

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.

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.

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-296-24615(1)(f)

Safety Line – Refer to Lifeline.
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.

NOTE: In order for the Warning Line and Safety Monitor System to be used, the Contractor must first demonstrate, in writing to the Engineer and Construction Safety, that the use of a fall arrest or restraint system is not feasible.

Safety Net System **-** A type of fall arrest system, as described in WAC 296-155-24613(2).

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.

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

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

Standard Guardrail System - A type of fall restraint system that is a vertical barrier consisting of a top rail and mid rail, and toe board when used as falling object protection for persons who may work or pass below, that is erected along all open sides or edges of a walking/working surface, a floor opening, a floor hole, wall opening, ramp, platform, or runway.

Static Line – Refer to Horizontal Lifeline.

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

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

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 296-155-24603.

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.

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).

NOTE: In order for the Warning Line and Safety Monitor System to be used, the Contractor must first demonstrate, in writing to the Engineer and Construction Safety, that the use of a fall arrest or restraint system is not feasible.

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

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. Contractors working on Port Construction Projects shall comply with the Port of Seattle's 100% Fall Protection Policy as well as WAC, and OSHA Standards.
   2. The use of a Warning Line System supplemented by the use of a Safety Monitor System as prescribed in *WAC* 296-155-Part C-1 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 to be used, the Contractor must first demonstrate, in writing to the Engineer, that the use of a fall arrest or restraint system is not feasible.

   3. Prior to permitting employees into areas where fall hazards exist the Contractor shall:
      a. Ensure that employees are trained and instructed in the items described in this section.
      b. Inspect fall protection devices and systems to ensure compliance with WAC 296-155-Part C-1.
   4. Submit any revisions to the Fall Protection Work Plan throughout the duration of the project.

F. Fall Protection Work Plan
   As referenced in WAC 296-155-24611(2) and 01 35 29 Safety Management, the Contractor shall develop and implement 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 shall be submitted to the Port of Seattle Construction Project Safety Staff prior to work.

1. The Fall Protection Work Plan shall:
    a. Identify all fall hazards in the work area.
    b. Describe the method of fall arrest or restraint to be provided.
    c. Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used.
    d. Describe the correct procedures for the handling, storage, and securing of tools and materials.
    e. Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site.
    f. Describe the method for prompt, safe removal of injured workers.
    g. Be available at the job site for inspection by the Safety Department.
    h. A template of the DOSH Fall Protection Work Plan can be found at the end of this section.

G. Employee Training
1. A qualified person(s) shall provide training required by this section.

2. The Contractor shall provide a training program for all personnel exposed to fall hazards. The program shall include 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.

H. Fall arrest protection shall consist 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 5,000 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 5,000 pounds (22.2 kN) applied at the lanyard point of connection.
    vi. Snap hooks shall not be connected to loops made in webbing type lanyards.
    vii. Snap hooks shall 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 and their use shall comply with the following provisions.
    a. Safety nets shall 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 shall 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	14 feet

c. Safety nets shall 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 shall 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 shall be drop-tested at the job site after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. 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. When the Contractor can demonstrate that it is unreasonable to perform the drop-test as required, the Contractor (or a Competent Person) shall certify that the net and net installation are in compliance by preparing a certification record prior to the net being used as a fall protection system. The certification record must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection.
e. The Contractor shall 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.
f. Materials, scrap pieces, equipment, and tools, which have fallen into the safety net, shall be removed as soon as possible from the net and prior to the next work shift.
g. Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).
h. Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than 6 inches (15 cm) apart.

3. Catch Platforms
    a. A catch platform shall be installed within 6 vertical feet of the work area.

b. The width of the catch platforms shall equal the distance of the fall but shall be a minimum of 45 inches wide. The catch platform shall be equipped with standard guardrails on all open sides.

I. Positioning Device Systems and their use shall conform to the following provisions.
   1. Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet (.61 m).
   2. Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.
   3. Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
   4. Connectors shall have a corrosion-resistant finish. All surfaces and edges shall be smooth to prevent damage to interfacing parts of this system.
   5. Connecting assemblies shall have a minimum tensile strength of 5,000 pounds (22.2 kN).
   6. D-rings and snap-hooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or taking permanent deformation.
   7. Positioning device systems shall be inspected prior to each use for wear, burns, damage, and deterioration. Defective components shall be removed from service.
   8. Harnesses and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.

J. 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 ¾-inch manila or equivalent with a minimum breaking strength of 5,000 pounds shall be used.

K. 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 Port of Seattle Construction 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 the skip or cage does not occlude the opening to within one foot of the sides of the shaft unless cages are provided.

L. Fall restraint protection as discussed in this section shall consist of:
   1. Standard guardrails as described in the following sections of this Manual: for Scaffolding, Ladders & Stairways, and Floor & Wall Openings.
   2. Harness attached to securely rigged restraint lines

a. Restraint protection shall 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 shall 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. The Contractor shall ensure component compatibility.
e. Components of fall restraint systems shall 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.
f. Anchorage points used for fall restraint shall be capable of supporting four times the intended load.

M. Leading Edge Control Zones
1. When performing leading edge work, the employer shall ensure that a control is established according to the following requirements:
    a. The control zone shall 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.
    b. The control zone shall be separated from the other work areas by the erection of a warning line.
    c. The warning line shall be constructed of wire, rope or chain supported by stanchions.
    d. The spacing of the stanchions and support of the line shall be such that it is not less than 36 inches from the work surface at its lowest point and not higher than 42 inches.
    e. Each line shall have a tinsel strength of 200 pounds.
    f. Each line shall be flagged or clearly marked with high visibility material not to exceed six (6) feet.
    g. After being erected the warning line shall be able to resist without tipping over, a force of at least sixteen (16) pounds.
    h. Any employee entering into the control zone shall utilize 100% fall protection.

N. Warning Lines
1. Warning lines utilized for the purpose of fall protection shall be erected 15 feet from the unprotected building edge or opening.
2. Warning lines utilized for guarding of low-pitched roofs shall be erected 6 foot from the unprotected building edge or opening.
3. Any employee working between the warning line and the roof edge shall utilize 100% fall protection.

O. Excavations

Pits, excavations, trenches, or caissons with vertical sides that expose employees to a fall hazard six (6) feet or greater shall be guarded by standard guard rails, fall restraint, or fall arrest systems. Fall protection is required as well at depths of six (6) feet or greater even if the person is considered to be directly involved with the excavation process. These include:

- Foreman of the crew
- Signal Person
- Employee hooking up the pipe or other materials
- Grade Person
- State, County, Port, or City inspectors inspecting the excavation or trench
- An engineer or other professional conducting a quality assurance inspection

If fall protection is unable to be constructed a warning line fifteen (15) feet from the unprotected edge or opening shall be erected. If this fifteen (15) distance can't be maintained, or would create a more hazardous condition approval from the Resident Engineer and Manager of Construction Safety must be submitted in writing for approval.

Exception:
Working at an excavation site where appropriate sloping of side walls has been implemented as the excavation protection system.

The employees are on the protective system or any other structure in the excavation.

P. Working Over Water

1. When working above water, the Contractor shall provide fall protection if the distance from the walking/working surface to the walking/working surface to the water's surface is ten (10) feet or more.
2. When fall protection is provided on walking/working surfaces located above water , and no drowning hazard exists, workers do not need to wear a U.S. Coast Guard approved life jackets or buoyant work vests.
3. The use of fall protection, including fall protection that eliminates drowning hazards, does not relieve the Contractor from having to provide ring buoys and a lifesaving skiff.

Fall Protection Work Plan-Template One

A written fall protection work plan must be implemented by each employer on a job site where a fall hazard of 10 feet or greater exists, in accordance with Department of Safety and Health Regulations. The plan must be specific for each work site.
THIS WORK PLAN WILL BE AVAILABLE ON THE JOB SITE FOR INSPECTION.

Attached is a sample of a model fall protection work plan that may be filled out by each employer who has employees exposed above 10 feet. The following steps will help you fill out your plan. **(REMEMBER: YOU MUST CUSTOMIZE THIS SAMPLE)**

1. FILL OUT THE SPECIFIC JOB INFORMATION

Company Name: _____

Job Name: _____ Date: _____

Job Address: _____

Job Foreman: _____ Jobsite Phone: _____

2. FALL HAZARDS IN THE WORK AREA
INCLUDE LOCATIONS AND DIMENSIONS FOR HAZARDS

Elevator shaft:
_____

Scaffold over 10 ft.:
_____

Exterior scaffolding:
_____

Scaffold under 10 ft.:
_____

Boom lift:
_____

Scissor lift:
_____

Leading edge:
_____

Stairwell:
_____

Outside static line:
_____

Window opening:
_____

Perimeter edge:
_____

Roof eave height:
_____

Rolling scaffold:
_____

Roof perimeter dimensions:
_____

Other fall hazards in the work area:

_____
_____
_____

3. METHOD OF FALL ARREST OR FALL RESTRAINT
(For fall protection equipment, include details, such as manufacturer etc…)

Full body harness:
_____

Lanyard:
_____

Dropline:
_____

Lifeline:
_____

Restraint line:
_____

Horizontal lifeline:
_____

Rope grab:
_____

Deceleration device:
_____

Shock absorbing lanyard:
_____

Locking snap hooks:
_____

Safety nets:
_____

Guard rails:
_____

Anchorage points:
_____

Catch platform:
_____

Scaffolding platform:
_____

Other:
_____

4. ASSEMBLY, MAINTENANCE, INSPECTION, DISASSEMBLY PROCEDURE
Assembly and disassembly of all equipment shall be done according to manufacturers' recommended procedures. (Include copies of manufacturer's data for each specific type of equipment used).

Specific types of equipment on the job are:

_____
_____
_____
_____

A visual inspection of all safety equipment shall be done daily or before each use, as stated in the Employee Training Packet. Any defective equipment shall be tagged and removed from use immediately. The manufacturer's recommendations for maintenance and inspection shall be followed:

_____
_____
_____

5. HANDLING, STORAGE & SECURING OF TOOLS AND MATERIAL
Toe boards shall be installed on all scaffolding to prevent tools and equipment from falling from scaffolding.

Other specific handling, storage and securing are as follows:

_____
_____
_____

6. OVERHEAD PROTECTION
Hard hats are required on all Port construction projects. Warning signs shall be posted to caution existing hazards whenever they are present. In some cases, debris nets may be used if a condition warrants additional protection.

Additional overhead protections will include:

_____
_____
_____
_____

7. INJURED WORKER REMOVAL
Normal first aid/CPR procedures should be performed as the situation arises. If the area is safe for entry, the first aid/CPR should be done by a foreman or other certified individual.
Initiate Emergency Services – Dial 911 from a non-POS phone and 9-911 from a POS phone.

The use of a cell phone may delay response time.
Phone Location:
_____

First Aid/CPR Location:
_____

Elevator Location:
_____

Crane Location:
_____

Other: _____ Location: _____

Rescue considerations

When personal fall arrest systems are used, the employer must assure that employees can be promptly rescued or can rescue themselves should a fall occur. The availability of rescue personnel, ladders, or other rescue equipment should be evaluated. In some situations, equipment that allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices that have descent capability.

Describe methods to be used for the removal of the injured worker(s):
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

8. TRAINING AND INSTRUCTION PROGRAM

All new employees shall be given instructions on the proper use of fall protection devices before they begin work. They will sign a form stating they have been given this information.

The written fall protection work plan shall be reviewed before the work begins on the job site. Those employees attending will sign below. The fall protection equipment use will be reviewed regularly at the weekly safety meetings.

Date: _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Prior to permitting employees into areas where fall hazards exist, all employees must be trained regarding fall protection work plan requirements. Inspections of fall protection devices/systems must be made to ensure compliance with WAC 296-155 Part C-1

Fall Protection Work Plan – Template Two

Why do I need a fall protection work plan?

- Falls from elevation are a major cause of injuries in the construction industry.
- Washington DOSH regulations require you to evaluate your worksite to identify fall hazards.
- You must then eliminate or control the fall hazards you identify.
- If falls hazards of 10 feet or more exist, you must provide a written plan which identifies:

    - All fall hazards in the work area.
    - The methods you and your employees will use to eliminate and control them.
    - Correct procedures for assembly, maintenance, inspection, an disassembly of fall protection systems used
    - Correct procedures for handling, storage, and securing of tools and materials.
    - The method of providing overhead protection
    - The method for prompt, safe removal of injured workers

Training methods for the employees working on the jobsite.

- The fall protection work plan must be specific to the work site.
- The fall protection work plan must be available on the work site for review.
- The documentation of training must be available on the work site for review.

How do I write the plan?

- Use the attached template to assist you
- Have a “competent employee” complete the template to make it work site specific
- Customize the template as needed by adding missing information and/or deleting unnecessary information.

NOTE: The plan form and individual site plans must accurately describe the conditions at your worksite and the methods you will use. A compliance officer will, in addition to ensuring that you plan contains all the required elements; determine if it describes what you actually do. If it does not, you may be subject to citation and monetary penalty!

Fall Hazard Identification and Protection Selection Worksheet

On the table below, identify each fall hazard of 10 feet or more that exists or will exist during this construction project and then select the protection method from the option identified below the table.

√	Hazard Type	General Location(s)	Fall Protection Method	Overhead Protection Method
	Roof > 4/12 Pitch			
	Roof < 4/12 Pitch			
	Skylight Openings			
	Roof Openings			
	Floor Openings			
	Window Openings			
	Open-sided Floors			
	Decks			
	Balconies			
	Leading Edge Work			
	Scaffold Work			
	Mobile Lift Work			
	Ladder Work			
	Excavation Edges			
	Grade Drop-Offs			
	Other			

Fall Protection

Fall Protection Methods: Select a fall protection method from the list below for each hazard identified above. Assembly and implementation instructions for the method(s) used are located elsewhere in this document.

Standard Guardrails	Fall Arrest Harness	Fall Restraint Harness/Belt
Warning Line System	Safety Net	Cover or Hatch
Warning Line	Positioning Belt	Other: _____

Overhead Hazard Protection Methods: For each overhead hazard identified, specify the method(s) of protection for workers below. Refer to the "Overhead Protection" Section of this plan for any special installation instructions.

Hard Hats Required 100%	Screens on Guardrails
Overhead Hazard Signs	Barricade to Control Access to Area
Debris Nets	Other: _____
Toe Boards on Guardrails	Other: _____

Fall Protection System Assembly and Maintenance

Fall protection systems will be assembled and maintained according to manufacturer's instructions when using a manufactured system.

A copy of those instructions is available on-site for reference. Any fall protection system used will meet Washington DOSH regulations as contained in WAC 296-155 Part C-1.

Assembly and maintenance instructions unique to this worksite such as components, placement of systems, anchor points, areas where systems are particularly subject to damage, etc., are specified below.

Standard Guardrails must:

- Be 39” to 45” above the work surface at top rail with midrail and toe board.
- Be able to withstand 200 pounds of pressure on top rail in any direction.
- Not have significant deflection.
- Be inspected regularly for damaged or missing components.

NOTE: A guardrail does not protect a person standing on a ladder, box, or other surface above the work surface.

Post Material: _____

Raw Material: _____

Post Spacing (8’ max): _____

Anchor Method: _____

Other Instructions:

_____

Fall Arrest Harness:

- Must have anchor points capable of withstanding a 5000-pound shock unless a deceleration device in use limits fall to 2 feet, in which case a 3000-pound anchor point may be used.
- Free fall may not exceed 6’.
- A lower level may not be contacted during a fall.
- Lifelines must be placed or protected to prevent abrasion damage.
- Snap hooks may not be connected to each other, or to loops in web ring.
- Inspect components for deformation, wear, and mildew.

System Component List:

_____

Anchor Point at this worksite:

_____

Configuration and placement sketch attached?

Yes _____ No _____

Other Instructions:

_____

_____

Positioning:

- Employees must not be able to fall more than 2 feet.
- The anchorage must be able to sustain 4 times the intended load.
- Snap hooks must not be connected to each other, or to loops in web ring.

System Component List:

_____

Anchor Point at this worksite:

_____

Other Instructions:

_____

Fall Restraint Harness:

Anchor Points:

- Must withstand 4 times the intended load.
- Must ***always*** prevent a free fall from the work surface. (Several alternate anchor points may be necessary to achieve this requirement).
- Inspect components for deformation, wear and mildew.

System Component List:

_____

Anchor Point at this worksite:

_____

Configuration and placement sketch attached:

Yes _____ No _____

Other Instructions:

_____

_____

Safety Nets must:

- Be installed within 30 feet vertically of the work surface.
- Extend out from the outermost projection of the work surface as specified below.
- Must be tested or certified to withstand a 400-pound object dropped from the highest work surface.
- Mesh at any point must not exceed 36 square inches with the largest opening being 6 inches side to side.
- Inspect weekly for mildew, wear or damage and remove any objects in net as soon as possible.

A person falling into the net cannot contact any object below the net.

System Component List:

_____

Anchor Point at this worksite:

_____

Maximum Fall Distance from Work Surface to Net: _____ Feet.

Vertical distance from working levels to horizontal plane of net	Minimum required horizontal distance of outer edge of the net from the edge of the working surface.
_____ up to 5 feet	08 Feet
_____ more than 5 feet up to 10 feet	10 Feet
_____ more than 10 feet	13 Feet

Configuration and placement sketch attached:

Yes _____ No _____

Other Instructions:

_____

_____

Covers or Hatches must:

- Be able to support twice the weight of employees and equipment that would be on it at the same time or twice the maximum axle load of the largest vehicle that would cross it.
- Be secured to prevent accidental displacement.
- Be marked with the work “Cover” or “Hole”

System Component List:

Anchor Point at this worksite:

Configuration and placement sketch attached:

Yes _____ No _____

Other Instructions:

_____

_____

Materials to use:

_____

Other Instructions:

_____

_____

Fall Protection Work Plan

Warning Line Systems must:

- Block access to all fall hazards in the work area.
- Be placed 15 feet back from the edge (6' for roof work less than 4:12 pitch or leading edge construction)
- Be made of rope, wire, or chain between 39" and 45" above the surface height.
- Be flagged at 6-foot intervals.
- Be attached to stanchions such that pulling on one section of chain will not take up slack in the other sections.
- Have stanchions that are able to withstand a 16-pound force applied horizontally at 30" high.

System Component List:

_____

Configuration and placement sketch attached:

Yes _____ No _____

Other Instructions:

_____

_____

<u>Controlled Access Zones must:</u>

- Meet the "Warning Line System" requirements describe above, 6' to 25' back from the edge .

This system is not to be used in adverse weather conditions such as snow, rain, or high wind, nor after dark.

Other Fall Protection System:

Provide a description of how the system is to be assembled, disassembled, operated, inspected, and maintained, including specifications for materials to be used in its construction:

_____

Fall Protection Work Plan

Emergencies and Injuries

First Aid/CPR Trained Employee(s) On Site:

Name: _____ Title: _____

Name: _____ Title: _____

First Aid/CPR Kit Location(s):

_____

Nearest Medical Facility:

_____

Emergency Services Phone Numbers:

_____

Medical: _____ Fire: _____ Police _____

If a crewmember is injured at elevation, the supervisor will evaluate the employee's condition and administer first aid/CPR. Emergency services will be called as needed. If an injured employee cannot return to ground level, the employee will be brought down to a lower level by emergency services. The following equipment is available on site to facilitate lowering the injured worker.

_____

_____

Fall Protection Work Plan

Employee Training:

All employees have been instructed on the provisions of this plan and have been trained in the proper use of the fall protection equipment involved. By signing this document, the employees acknowledge that they understand the plan and have been trained in the use of the equipment.

Name	Signature	Date

The competent person's signature verifies that the hazard analysis has been done, the employees informed of the plan's provisions and that employees have received training in the fall protection systems in use:

Name:	Signature:	Date:

Scaffolding

A. Scope
This section defines minimum safety requirements to be followed by Contractors when erecting, dismantling, moving, or altering scaffolding on the Port of Seattle Construction Project.

B. Purpose
To prevent injury to employees working on or around scaffolding.

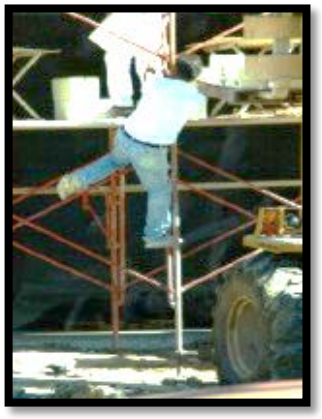
C. Reference:
29 CFR Subparts L & M, WAC 296-874 as well as the Fall Protection section of this Manual.

D. Definitions
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.

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 Competent Person qualified in scaffold erection, moving, dismantling or alteration.
2. All scaffolding and stair towers shall 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 the 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 shall be modified as necessary.)
    b. Green Tag – Scaffold meets and/or exceeds all applicable regulations thus is safe to use.
    c. Yellow Tag – WARNING – This scaffold does not comply with applicable regulations and has restrictions placed on it by the Competent Person. EXAMPLE: Fall arrest protection may be required.

   d. Red Tag – DANGER – This scaffold is not to be used except by the erecting crew performing installation, alteration, or dismantling activities.
3. All scaffolds over 26 feet in height shall be tied in to the structure, beginning at this height and every 26 feet thereafter. Scaffold shall 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 shall be sound and rigid, capable of supporting the intended weight. Unstable objects, such as bricks, shall not be used in the supports.
5. When screw jacks are used to level the platform, they shall be installed according to manufacturer's specifications.
6. Scaffolds with a working decking of 6 feet in height shall have a standard guardrail system on all open sides.
7. Top rails shall 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 shall 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 shall be able to support at least four times the intended load.
10. Any component of a scaffold damaged or weakened for any reason shall be immediately repaired or replaced.
11. The space between the bottom of the toe board and scaffold decking shall not exceed ½ inch
12. Maximum span for 2" x 12" planks shall 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 shall be used to ensure safe footing.
15. An access ladder or equivalent safe means of access shall be provided at all work areas.
16. Each end of planking on platforms shall be overlapped a minimum of 12 inches and secured from movement.



17. Scaffold planks shall extend over their end support at least 6 inches, but not more than 12 inches.
18. Width of all scaffolds shall be determined by their purpose, but in no case shall they be less than 18 inches. They shall 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 shall be provided for personnel on a scaffold exposed to overhead hazards.
21. Wire rope used for scaffold suspensions shall be capable of supporting six times the intended load.
22. Shore or lean-to scaffolds are prohibited.
23. Scaffolds exceeding 125 feet in height shall be designed and erected under the supervision of a Professional Engineer competent in this field.
24. Narrow gauge scaffolds (30 inches wide) shall not have working platform erected 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 shall be provided between the toe board and top rail.

F. Tubular Welded Frame

1. The scaffold and its component parts shall be designed to support four times the rated load.
2. Scaffolds shall be braced, and the braces shall be of the proper length so that the scaffold will remain plumb and rigid.
3. Scaffold legs shall bear on base plates that rest on mudsills or other firm foundations such as concrete.

G. Float

1. A float scaffolding shall 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 shall not be less than 3 feet wide and 6 feet long, made of ¾-inch plywood equivalent to American Plywood Association Grade B-B, Group I, exterior or similar material.
3. The two supporting bearers shall be 2”x 4” or 1”x10” 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 shall be placed around all sides of the platform to prevent tools from rolling off.

5. Supporting ropes shall 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 shall 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 shall not be less than 20 inches or more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.
   2. The hangars of two-point suspension scaffolds shall 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 shall suspend two-point suspended scaffolds. All other components shall be capable of supporting at least four times the rated load.
   4. No more than two employees shall be permitted to work at one time on suspension scaffolds designed for a working load of 500 pounds. No more than three employees shall 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. The lifeline shall 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, shall be tested and listed according to Underwriters Laboratories or Factory Mutual Engineering Corporation or some other recognized authority for suitable certification.

I. Scaffold Plank
   1. Planks shall be inspected on a daily basis. The planks shall conform to the established structural grades. Any split or damaged plank shall be removed from service.
   2. The ends of the plank may be painted a bright color for easy identification, and can be banded with strap iron bands to prevent splitting.

J. Stair tower Scaffolds
   1. In addition to meeting the requirements within this section, and WAC 296-974, stairways shall meet WAC 296-155-477 requirements.

Ladders & Stairways

A. Scope

This section defines minimum safety requirements to be followed by Contractors where access and egress issues exist on the Port of Seattle construction projects.

B. Purpose

To prevent injury to employees while accessing elevated work areas using ladders, stairs or ramps.

C. Reference:

29 CFR Subpart X, and WAC 296-876, and the Fall Protection section of this Manual.

D. Definitions

Job-made Ladder – A ladder that is project fabricated, not commercially manufactured.

Portable Ladder – A ladder that can be easily moved or carried.

Step Ladder – A self-supporting, foldable, portable ladder.

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 shall 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 shall 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 shall be immediately removed from service by tagging “out of service” and removing it from the work area by the end of shift.
8. Ladders shall not be painted with opaque material other than for identification marking.

9. Ladders made of conductive material shall not be used where electrical hazards exist.
10. Ladders shall be placed on a substantial base.
11. Ladders shall 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 shall be demarcated around the base also.
14. Ladders shall 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 shall extend not less than 36 inches (3 rungs) above a landing.
16. Ladders should be accessed using both hands, facing the rungs.
17. Ladders shall not be used by more than one person at a time unless so designed, and never more than two persons.
18. Tools should be retrieved by use of a rope haul or hoist so that 3-point contact is maintained.

F. Job-Made Ladders

1. Job-made ladders shall 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.
2. Double-cleat ladders shall not exceed 24 feet in length; single- cleat ladders shall not exceed 30 feet in length.
3. The width of single-cleat ladders shall be at least 15 inches, but not more than 20 inches, between rails at the top.
4. Side rails shall be parallel or flared top to bottom by no more than 1/4 inch for each 2 feet of length.
5. 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.
6. 2 x 4 lumber shall be used for single cleat ladders up to 16 feet in length; 3-inch (or 2 x 6) lumber shall be used for single-cleat ladders from 16 to 30 feet in length.
7. 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.
8. Cleats shall be inset into the edges of the side ½ inch or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with common wire nails or other fasteners of equivalent strength. Cleats shall be uniformly spaced, 12 inches top to top.
9. Job-made ladders shall be used at such a pitch 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.

G. Portable Ladders
    1. Extension Ladders
        a. Extension ladders shall be equipped with anti-slip feet.
        b. The fly section of an extension ladder shall not be used alone.
    2. Step Ladders
        a. Stepladders shall only be used as designed, completely opened with latches locked.
        b. The top two steps (top rung and top platform member of stepladders) are not to be used for access.

H. Portable Step Ladders
    1. Stepladders shall only be used as designated, 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, shall 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 shall be eighteen inches or more wide.
    2. They shall have standard railings when located four or more feet above the ground.
    3. They shall 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 shall not be used for the construction of ladders, stairways, or ramps.

Floor & Wall Openings

A. Scope
This section defines the minimum safety requirements for floor and wall opening protection on the Port of Seattle construction projects.

B. Purpose
To prevent injury to employees and visitors from falling through or having materials fall through open sided floors, roof or wall openings or other open-sided walking/working surfaces.

C. Reference
WAC 296-876 Ladders; 29 CFR Subparts L, M, Q, R, and X, WAC 296-155 Parts C-1, J, J-1, O, and P; as well as the Fall Protection and Ladders & Stairways sections of this Manual.

D. Definitions
Floor Opening – An opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which a person could fall.

Floor Hole – An opening measuring less than 12 inches but no more than 1 inch in its least dimension in any floor, roof, or platform through which material but not persons may fall.

Standard Railing – A standard railing shall consist of posts, top rail, intermediate rail, and toe board.

E. Guarding of Floor Openings (12” or greater)
1. Floor openings into which person(s) can accidentally walk shall be guarded by the following:
    a. Ladder-ways. Standard railings shall guard floor openings or platforms on all exposed sides except at the entrance to the opening. Passages through the railing shall either be offset or equipped with swing gate so that a person cannot walk directly into the opening.
    b. Hatchways and chute floor openings shall be guarded by one of the following:
        i. Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side guarded by removable standard railings.
        ii. A removable standard railing on not more than two sides of the opening and fixed standard railings on all other exposed sides. The

removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

2. All floor opening “covers” shall be:
    a. Secured when installed to prevent accidental displacement by wind, equipment, or employees.
    b. Capable of supporting the maximum potential load, but never less than 200 pounds.
    c. Marked with the word "hole" or "cover" in a high visibility paint to provide warning of the hazard.
    d. If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard and prevent exposure to the fall hazard, but perform no other duties.
    e. Any monitor or employee within six (6) foot of the opening shall utilize a 100% fall protection system.

NOTE: In order for the Warning Line and Safety Monitor System to be used, the Contractor must first demonstrate, in writing to the Engineer and Construction Safety, that the use of a fall arrest or restraint system is not feasible.

3. Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a 200-pound person, standard guardrails shall be provided on all exposed sides or the skylight shall be covered.
4. Conduits, trenches, and manhole covers and their supports, when located in roadways and vehicular aisles, shall be designed to carry a truck rear axle load of at least 2 times the maximum intended load.

F. Guarding of Floor Holes (12” or less)
1. All floor holes shall be guarded with a cover.
2. All floor hole covers shall be capable of supporting the maximum potential load, but never less than 200 pounds.
3. All covers shall be secured when installed to prevent accidental displacement by wind, equipment, or employees.
4. If the cover is not large enough to be marked with the word "hole" or "cover" to provide warning of the hazard it shall be marked with a high visibility paint to identify it.
5. If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard and prevent exposure to the hazard, but perform no other duties.

NOTE: In order for the Warning Line and Safety Monitor System to be used, the Contractor must first demonstrate, in writing to the Engineer and Construction Safety, that the use of a fall arrest or restraint system is not feasible.

G. Guarding of Wall Openings
   1. Wall openings from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:
      a. When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided.
      b. The bottom of a wall opening that is less than 4 inches above the working surface (regardless of width) shall be protected by either a standard toe board or an enclosing screen of solid construction.
   2. An extension platform outside a wall opening, onto which materials can be hoisted for handling, shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials. When the railing is removed to accommodate material being transferred, the employees handling those materials shall utilize **100%** fall protection when exposed to a fall of four (4) foot or greater.
   3. Wall opening protection shall meet the following requirements.
      a. Barriers shall be of such construction and mounting such that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.
      b. Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200
      pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of grillwork with openings not more than 8 inches long or of slat work with openings not more than 4 inches wide with length unrestricted.

H. Guarding of Open-Sided Surfaces
   1. Every open-sided floor, platform or surface four (4) foot or greater above the adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toe board wherever, beneath the open sides, persons can pass, or there is moving machinery or equipment.

2. Runways 4 feet or more above the floor or ground level shall be guarded by a standard railing (or the equivalent on all open sides). Wherever tools or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.
3. When operations, tool or material use or storage is such that a standard toe board does not provide protection, paneling, or screening from the floor to the intermediate rail or top rail shall be provided.
4. Additional guarding shall be provided where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger that is not a falling hazard.
5. Regardless of height, open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, such as conveyors and similar hazards shall be guarded with a standard railing.

I. Standard Specifications

1. A standard railing shall consist of top rail, intermediate rail, toe board, and posts. It shall have a vertical height of 39 inches to 45 inches from upper surface of top rail to floor, platform, runway, or ramp level.
2. Each length of lumber shall be smooth surfaced throughout the length of the railing.
3 The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp.
4. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.
5. Double-headed nails shall not be used in the construction of guardrail systems.
6. Minimum requirements for standard railings under various types of construction are specified in the following:
    a. For wood railings, the posts shall be of at least 2 x 4 stock spaced not to exceed 8 feet; the top rail shall be of at least 2 x 4 stock; the intermediate rail shall be of at least 1 x 6 stock.
    b. For pipe railings, posts and top and intermediate railings shall be at least 1-1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.
    c. For structural steel railings, posts and top and intermediate rails shall be of 2-inch x 2-inch by 3/8 inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.
    d. WAC 296-155-24615 (2)(b)(iv) For wire rope railings, the top and intermediate railings shall meet the strength factor and deflection of (b)(v) of this subsection. The top railing shall be flagged at not more than six-foot intervals with high-visibility material. Posts shall be spaced not more than eight feet on centers. The rope shall be stretched taut and shall be between thirty-nine and forty-five inches in height at all points. Other configurations may be used for the top rail when the configuration meets the requirements of (b)(vii) of this subsection.

e. When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope. U-Bolt wire rope clips shall be made of dropforged steel.

CORRECT METHOD OF ATTACHING WIRE ROPE CLIPS

U-Bolt of all clips on dead end of rope

Number and spacing of U-bolt wire rope clips

Improved Plow Steel	# of Clips – Drop Forged	Minimum Spacing (inches)
3/8 and under	2	3
1/2	3	3
5/8	3	3
3/4	4	4-1/2
7/8	4	5-1/4
1	5	6
1-1/8	6	7
1-1/4	6	8
1-3/8	7	9
1-1/2	7	10

f. The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

g. Railings receiving heavy stresses from employees or material handling shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

h. Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:
    i. A smooth surfaced top rail at a height between 39 inches and 45 inches above floor, platform, runway, or ramp level.
    ii. Strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection.
    iii. Protection between top rail and floor, platform, runway, ramp, or stair treads equivalent at least to that afforded by a standard intermediate rail.
    iv. Elimination of overhanging rail ends unless such overhang does not constitute a hazard.

NOTE: Railings shall not be used as a connection device for fall protection unless so designed by a registered professional engineer with documentation submitted to construction safety and kept on site.

7. A standard toe board shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place, with not more than 1/4-inch clearance above floor level. It may be made of any substantial material, either solid or with openings not over 1 inch in greatest dimension.

Steel Erection

A. Scope

This section defines minimum safety requirements for Contractor personnel engaged in the construction, alteration, and/or repair of single and multi-story building, bridges, and other structures where steel erection occurs.

B. Purpose

The purpose of this program is to provide guidance to assure all measures are taken to protect personnel from the hazards associated with steel erection activities. The program is also intended to assure that steel erection activities do not create overhead hazards that may expose personnel to injuries, and equipment to property damage.

C. Reference

29 CFR Subparts R, J, & M, WAC 295-155 Parts P, C-1 and H, as well as the Fall Protection section of this Manual.

D. Definitions

Anchored Bridging – Steel joist bridging is connected to a bridging terminus point.

Bolted Diagonal Bridging – Diagonal bridging bolted to a steel joist or joists.

Bridging Clip – A device attached to the steel joist to allow bolting of the bridging to the steel joist.

Bridging Terminus Point- Tandem joists (with all bridging installed and a horizontal truss in the plane of the top chord) or other element at an end or intermediate point(s) of a line of bridging which provides and anchor point for the steel joist bridging.

Choker – A wire rope or synthetic fiber rigging assembly, which is used to attach a load to a hoisting device.

Cold Forming – The process of using press brakes, rolls, or other methods to shape steel into desired cross sections at room temperature.

Column – A load-carrying vertical member, which is part of the primary skeletal framing system. Columns do not include posts.

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

Connector – Construction personnel who, working with hoisting equipment, is placing and connecting structural members and/or components.

Constructability – The ability to erect structural steel members in accordance with the Steel Erection standards without having to alter the over-all structural design.

Construction Load – Any load other than the weight of the worker(s), the joists and the bridging bundle.

Control Zone – The area between the warning line and unprotected sides and edges of the waling/working surface.

Controlled Load Lowering–Lowering a load by means of a mechanical hoist drum device, allowing a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist drive motor, rather than the load hoist brake, to lower the load.

Controlling Contractor - A prime contractor or general contractor, which has the overall responsibility for the construction of the project (its planning, quality and completion).

Critical Lift – A lift exceeding 75 percent of the rated capacity of the crane OR requires the use of more than one crane or derrick.

Decking Hole – A gap or void more than 2 inches (5.1 cm) in its least dimension and less than 12 inches (30.5 cm) in its greatest dimension in a floor, roof, or other walking/working surface. Pre-engineered holes in cellular decking (for wires, cables, etc.) are not included in this definition.

Derrick Floor – An elevated floor of a building or structure designated to receive hoisted pieces of steel prior to final placement.

Double Connection – An attachment method where the connection point is intended for two pieces of steel that share common bolts on either side of a central piece.

Double Connection Seat – A structural attachment, which, during the installation of a double connection, supports the first member while the second member is connected.

Erection Bridging – The bolted diagonal bridging required to be installed prior to releasing the hoisting cables from the steel joists.

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 296-155-24611(2).

Fall Restraint System – A fall protection system preventing the user from falling any distance.

Final Interior Perimeter – The perimeter of a large permanent open space within a building, such as an atrium or courtyard. This does not include openings for stairways, elevator shafts, etc.

Girt – A "Z" or "C" shaped member formed from sheet steel spanning between primary framing and supporting wall material.

Headache Ball – The ball/hook assembly used to attach loads to the hoist load line of a crane.

Hoisting Equipment – Commercially manufactured lifting equipment designed to lift and position a load of known weight to a location at some known elevation and horizontal distance from the equipment's center of rotation. A "come-a-long", which is used to facilitate movement of materials through leverage, is not considered hoisting equipment.

Leading Edge – The unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck), which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed.

Metal Decking – Commercially manufactured, structural grade, cold rolled metal panel formed into a series of parallel ribs; this includes metal floor and roof decks, standing seam metal roofs, other metal roof systems and other products such as checker plate, expanded metal panels and similar products.

Multiple Lift Rigging (Christmas Tree Rigging) – A rigging assembly manufactured by wire rope rigging suppliers facilitating the attachment of up to five independent loads to the hoist rigging of a crane.

Opening – A gap or void 12 inches (30.5 cm) or more in its least dimension in a floor, roof or other walking/working surface. For the purposes of this policy, skylights and smoke domes not meeting the strength requirements of a floor or roof cover shall be regarded as openings.
Permanent Floor – A structurally complete floor.

Personal Fall Arrest System – A system used to arrest a worker in a fall from a walking/working level. The system consists of an anchorage, connectors, and a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination.

Positioning Device – A positioning harness or full body harness rigged to allow a worker to be supported on an elevated, vertical surface, such as a wall or column and work with both hands free while leaning. For definition of positioning harness, see definition in part C-1.

Post – A structural member with an essentially longitudinal axis, which weighs 300 pounds or less and is axially loaded, OR is not axially loaded, but is laterally restrained by the above member.

Project Structural Engineer of Record – The registered, licensed professional responsible for the design of structural steel framing and whose seal appear on the structural contract documents.

Purlin – A “Z” or “C” shaped member formed from sheet steel spanning between primary framing and supporting roof material.

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

Safety Deck Attachment – An initial attachment used to secure an initially placed sheet of decking to keep proper alignment and bearing with structural support members.

Shear Connector – Headed steel studs, steel bars, steel lugs, and similar devices, which are connected to a structural member for the purpose of achieving composite action with concrete.

Steel Erection – The construction, alteration, or repair of steel buildings, bridges and other structures including the installation of metal decking and all planking used during the process. This includes layout, rigging, hoisting, placing, connecting, burning, welding, guying, bracing, bolting, plumbing of structural steel, steel joists, metal buildings, installing metal decking, curtain walls, window walls, siding, ornamental iron and similar materials, and moving point-to-point while performing these activities.

Steel Joist – Open web, secondary load-carrying member of 144 ft. (43.9 cm) or less used for support of floors and roofs.

Steel Joist Girder – Open web, primary load-carrying member used for the support of floors and roofs.

Steel Truss – Open web member designed by the project engineer of record.

Structural Steel – A steel member, or a member made of equivalent substitute material. These members include, but is not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, girts, all bridging, and cold formed metal framing integrated with the structural steel framing of the building.

Tank – A container for holding gases, liquids or solids.

Unprotected Sides and Edges – Any side or edge, except at entrances to points of access, of a walking/working surface, for example a floor, roof, ramp or runway, where there is no wall at least 39 in. (1.0 m) high or guardrail system.

E. General Requirements

Site Layout, Site-specific Erection Plan and Construction Sequence

1. Prior to authorizing steel erection activities, the Contractor shall ensure the Steel Erection Subcontractor is provided with the following written notifications:
   a. A copy of the Steel Erection Procedures found in the section for Steel Erection of the Port of Seattle Construction Safety & Health Manual.
   b. Verification of concrete strength for footer, piers and walls.
   c. Adequate access into and through the site for the safe delivery and movement of necessary equipment and materials to be erected shall be provided and maintained.
   d. Safe means and methods for pedestrian and vehicular control shall be determined.
   e. Provide a firm, properly graded, drained area, with adequate space for storage of materials and operations office.
   f. Approval to begin the steel erection process.
2. Prior to the Contractor receiving Notice to Proceed of steel erection activities, they shall provide the Engineer with the following:
   a. A signed copy of the Steel Erection Coordination Checklist (page 114) completed by the Contractor and the steel erector.
   b. A Job Hazard Analysis (JHA) for the steel erection activity.
   c. A Site-Specific Erection Plan as referenced in the Steel Erection Safety Standard developed by a Qualified Person. This plan shall be available at the work site for inspection. These requirements shall meet or exceed the guidelines of 29 CFR 1926 Subpart R, Appendix A and shall include: pre-planning, hoisting, rigging, fall protection, and erection sequence.
   d. A written Fall Protection Work Plan as defined in the section for Fall Protection of this Manual.

e. The names and designated responsibilities of the steel erector's Competent Person(s), qualified rigging personnel, and crane operator(s).
f. Verification of the make, model and year of the crane to be utilized for hoisting, a copy of the current annual certification of inspection, document proof of controlled lowering device, and manufactures recommendations concerning multiple lift rigging.
g. Copies of training records in reference to Fall Protection, Multiple Lifts, and Connecting Procedures as found in part G of this section.

3. Steel Erection submittals shall be made in accordance with 01 33 00 -Submittals 1.02.I.

F. General Safety Requirements

1. The operator is responsible for items being hoisted and shall consider factors such as excessive weight, shape or size, rigging, and weather or ground conditions, before hoisting.
2. Containers shall be provided for storing or carrying bolts, drift pins, and other loose objects. Containers shall be secured against accidental displacement when used aloft.
3. When welding or burning is performed from floats or other suspended work platforms, wire rope or cable shall be used for suspension. Protect the suspension from possible arcing by covering with non-conductive material.
4. Procedures for hot work, fire watch, cutting and welding as well as the storage and use of compressed gas cylinders shall be followed.

G. Fall Protection shall consist of one or more of the following:

1. The use of a Warning Line System supplemented by the use of a Safety Monitor System as prescribed in *WAC* 296-155-Part C-1 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 to be used, the Contractor must first demonstrate, in writing to the Engineer, that the use of a fall arrest or restraint system is not feasible.

2. General requirements - Each person engaged in a steel erection activity on a walking/working surface with an unprotected side or edge more than 4 feet above a lower level shall be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems or fall restraint systems.
3. Open web steel joists and girders shall not be used as an anchorage point for a fall arrest system without written approval obtained from a qualified person.

4. Perimeter safety cables - On multi-story structures, perimeter safety cables shall be installed at the interior and exterior perimeters of the floors as soon as the metal decking has been installed.
5. Connectors shall each:
    a. Have completed connector training in accordance with 29 CFR 1926.761 and WAC 296-155-717.
    b. At heights over 6 feet above a lower level shall be protected with a personal fall arrest system or fall restraint system.
6. Safety Net System as found in this Manual.
7. Control Zones
    a. When performing leading edge work, the employer shall ensure that a control zone established according to the following requirements:
    b. The control zone shall 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.
    c. The control zone shall be separated from the other work areas by the erection of a warning line.
        i. The warning line shall be constructed of wire, rope or chain supported by stanchions.
        ii. The spacing of the stanchions and support of the line shall be such that it is not less than 36 inches from the work surface at its lowest point and not higher than 42 inches.
        iii. Each line shall have a tinsel strength of 200 pounds.
        iv. Each line shall be flagged or clearly marked with high visibility material not to exceed six (6) feet.
        v. After being erected the warning line stanchions shall be able to resist without tipping over, a force of at least sixteen (16) feet pounds allied 30 inches above the roof surface.
        vi. Any employee entering into the control zone shall utilize 100% fall protection!
8. Custody of Fall Protection – fall protection provided by the steel erector shall remain in the area where steel erection activity has been completed, to be used by other trades. The controlling Contractor shall:
    a. Direct the steel erector to leave the fall protection in place; and
    b. Inspect and accept control and responsibility of the fall protection prior to authorizing persons other than steel erectors in work in the area.
    c. Provide written documentation regarding this issue.

H. Training
   1. Training required by this section shall only be provided by a qualified person.
   2. Fall Protection Training – The Contractor shall provide training for all personnel exposed to fall hazards. The program shall include 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.
   3. Special Training Programs

      Contractors shall ensure personnel are properly trained for the following activities:
      a. Multiple Lifts – The nature of the hazards associated with and the proper procedures for multiple lifts, and the equipment to perform the work; and,
      b. Connector Procedures – The nature of the hazards associated with connecting and the establishment, access, proper connecting techniques, and work practices required by WAC 296-155-708 (3) and WAC 296-155 Part C-1.

I. Falling Object Protection
   1. Secure all materials, equipment and tools against accidental displacement while not in use.
   2. Personnel shall not work, walk or pass below steel erection unless overhead protection is provided.

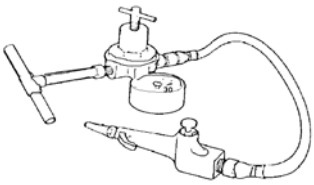
J. Footings and Anchors
   1. The concrete in the footing, piers and walls, and the mortar in the masonry piers and walls have attained either 75 percent of the intended minimum compressive design strength or sufficient strength to support the intended loads.
   2. Anchor bolts will not be repaired, replaced or “field” modified without the written notification/consent of the Engineer.
   3. Any repairs, replacements and modifications to the anchor bolts were conducted in accordance with 29 CFR 1926.755 (b) and WAC 296-155-707 (2).

K. Column Anchorage

1. Columns shall be anchored by a minimum of 4 anchor rods/bolts.
2. Anchor rod/bolt assemblies shall resist a minimum eccentric gravity load of 300 lbs. (136.2 kg) located 18 in. (.46 cm) from the extreme outer edge of the column in each direction at the top of the column shaft.
3. Columns shall be set on level finished floors, pre-grouted leveling plate, leveling nuts, or shim packs that are adequate to transfer the construction loads.
4. A competent person shall evaluate each column to determine if guying or bracing is needed.

L. Bolting, Fitting-Up, Drilling and Reaming

1. Air Tools
   a. Pneumatic hand tools shall be disconnected from the power source and pressure in hose lines released before any adjustments or repairs to the tools are made.
   b. Air hose sections shall be tied together with "whip checks" except when quick disconnect couplers are used to join sections.
   c. Chicago-type connections or couplers shall be pinned.
   d. Air hoses located on roadways shall be protected to prevent vehicular damage.



2. Bolting
   a. When bolts or drift pins are being knocked out, a means shall be provided to keep the bolts or drift pins from falling.
   b. Bolts, nuts, washers, and pins shall not be thrown. They shall be placed in bolt baskets or other approved containers and raised or lowered by a line. Bolt baskets, buckets or other approved containers will be secured to the steel or lanyards while on "open" steel.
   c. Impact wrenches shall be provided with a locking device for retaining the socket.
3. Drilling and Reaming
   a. Two employees shall operate drilling and reaming machines, unless the handle is firmly secured to resist the torque reaction upon the machine in the event that the drilling or reaming bit should foul.

M. Hoisting and Rigging

1. Pre-Shift Visual Inspection of Cranes.
   a. The crane operator shall be responsible for the performance of any activity during crane use. The operator will have the authority to stop work or refuse to handle loads until applicable safety measures have been taken in regard to the safety concern.
   b. A Competent Person shall visually inspect cranes prior to each shift.

   c. In addition to crane systems and equipment, the inspection shall include ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions.
   d. The inspection shall be documented, maintained on site, and shall include observation for deficiencies during operation.
   e. Any deficiencies noted for safety devices, or any deficiency determined to be a hazard, the equipment shall be removed from service until the deficiencies are corrected.
2. A qualified rigger shall inspect the rigging prior to each shift and during use. Damaged or defective rigging shall be immediately removed from the project.
3. The headache ball, hook or load shall not be used to transport personnel.
4. The use of a crane or derrick to hoist employees on a suspended work platform is prohibited under normal circumstances. Only when the erection, use, dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.
   a. If the Contractor determines that the use of a suspended work platform is necessary, a meeting shall be held between the Contractor's Project Manager, Safety Manager, the Engineer and a member of the CIP Safety Group. A written plan, compiled by the Contractor and meeting the crane manufacturer's specifications will be submitted for review. The plan shall at a minimum include the compelling reasons why conventional means and methods are not feasible or create a greater hazard, how the cranes instruments and components function, which type of positive acting device will prevent contact between the load block or ball and the boom tip and written procedures for suspended work platform use. For requirements, refer to this Manual.
5. Material being hoisted shall be rigged to prevent unintentional displacement.
6. Safety latches on hooks shall not be deactivated or made inoperable.
7. Multiple Lift Rigging (Christmas Treeing)
   a. A multiple lift shall only be performed when the following are met:
      i. The crane manufacturer's specifications and limitations permits the use of the crane for a multiple lift;
      ii. A multiple lift rigging assembly is used;
      iii. A maximum of five members hoisted per lift;
      iv. Only beams and similar structural members are lifted; and
      v. All personnel engaged in the multiple lifts are trained in accordance with 29 CFR 1926.761 (c)(1) and WAC 296-155-717(3)(a).
   b. The load capacities for the total multiple lift rigging assembly and for each individual attachment point shall not be exceeded. The capacity shall be based upon the manufacturer's specifications with a 5:1 safety factor for all components.

c. The total load shall not exceed the hoisting equipment capacity specified in the equipment load charts or the rigging capacity specified in the rigging-rating chart.
d. The multiple lift assembly shall be rigged with members attached at their center of gravity, rigged from the top down and rigged at least 7 ft. apart.
e. The members of the lift shall be set from the bottom up.
f. Controlled load lowering shall be used whenever the load is over the connectors.

8. Working Under Loads
   Only those personnel directly involved with the initial connection, or the hooking/unhooking of suspended loads will be permitted under the loads.
9. Critical Lift Plan. Proof of compliance with sections for Suspended Work Platform Procedures and Cranes & Rigging will be required when the load is 75% or greater of the cranes capacity, or multiple cranes are used.

N. Structural Steel Assembly

1. Structural stability shall be maintained at all times.
2. Permanent floors shall be installed as the erection of steel progresses. There shall be no more than eight (8) stories between the erection floor and the uppermost permanent floor.
   a. There shall be no more than four (4) floors or 48 ft. (14.6 m); whichever is less, of unfinished bolting or welding above the foundation or uppermost permanent floor.
3. Walking Working Surfaces
   a. Shear connectors, reinforcing bars, deformed anchors or threaded studs shall not project vertically from or horizontally across the top flange of a steel member until after the metal decking, or other walking/working surface has been installed.
   b. Shear connectors used in the construction of composite floors, roofs and bridge decks shall be laid out and installed after the metal decking has been installed and while using the metal decking as a working platform.
4. Plumbing-Up Equipment
   a. All plumbing-up equipment, when used, shall be installed in conjunction with steel erection, in place and properly installed before the structure is loaded with construction material, and removed only with the approval of a Competent Person.
   b. Connections for the rigging equipment used for plumbing-up shall be safely secured.
   c. A restraint device shall be used when the turnbuckle is under load stress during plumbing.
   d. Guys for plumbing-up and related equipment shall be placed so that employees can reach the connection points.
   e. Guys shall be removed only under the supervision of a competent person.
5. Metal Decking

a. Bundle packaging or strapping shall not be used for hoisting, landing and placing of metal decks unless specifically designed for that purpose.
b. Secure loose items placed on top of metal deck bundles to be hoisted to prevent dislodging.

6. Roof, Floor Holes and Openings
   a. Structural members shall be turned down to allow continuous deck installation.
   b. Metal deck openings and holes shall not be cut until immediately prior to installing the equipment or structure intended for each location. Openings and holes, which cannot be immediately filled, shall be covered in accordance with paragraph 5 c of this section.
   c. Roof and floor holes and openings shall be immediately decked over. Install standard guardrail systems and toe boards when size, configuration or structural design does not allow deck installation.
   d. Covers for openings and holes shall be capable of:
      i. Withstanding four (4) times the weight of personnel, equipment and materials imposed upon the cover at any one time;
      ii. Be affixed to prevent displacement; and
      iii. Labeled “Danger – Cover” or “Danger – Hole” with high visibility paint.
   e. Smoke dome or skylight fixtures shall not be considered acceptable covers unless they meet the strength requirements of (d) Opening of this section.
7. Decking gaps around columns shall be covered with wire mesh, exterior plywood, or equivalent, where planks or metal decking do not fit tightly.
8. Metal decking around columns shall be laid tightly and immediately secured upon placement. Initial placement of decking panels shall ensure full support by structural members.
9. Derrick floors shall be fully decked and/or planked and the steel member connections completed. Distribute Temporary loads over the underlying support members to prevent overloading of the deck material.

O. Beams and Columns

1. The load shall not be released from the hoist line during placement of solid web structural members until the members are secured with at least two (2) bolts per connection, of the same size and strength shown in the erection drawings, drawn up wrench tight.
2. To ensure the stability of cantilevered members, a competent person shall determine if more than two (2) bolts per connection are necessary.
3. Diagonal bracing shall be secured by at least one (1) bolt per connection, drawn up wrench tight.
4. Double connections on opposite sides of column webs, or a beam web over a column, shall have at least one bolt with its wrench-tight nut remain connected to the first member unless:

a. A shop-attached or field-attached seat or equivalent connection device is used.
b. If a seat or equivalent device is used it shall:
    i. Be designed to support the load during the double connecting process and,
    ii. Be bolted or welded to both a supporting member and the first connecting member before the nuts on the shared bolts are removed.

5. Perimeter columns shall be erected so:
    a. The columns extend at least 48 inches (1.2 m) above the finished floor to permit perimeter safety cable installation and,
    b. The columns have holes or other devices in or attached to the columns at 42 – 45 in. (107 – 114 cm) above the finished floor and at the midpoint between the floor and the top cable.

P. Open Web Steel Joists

1. Where steel joists are used and columns are not framed in at least two directions with structural members, a steel joist shall be field-bolted at the column to provide lateral stability during erection. The Contractor shall:
    a. Provide a vertical stabilizer plate, at least 6” x 6”, on each column for steel joists, extending at least 3” below the bottom cord of the joist for attachment of guying or plumbing cables;
    b. Stabilize the bottom cords of steel joists at each column to prevent rotation while erecting;
    c. Shall not release the hoisting cable until the seat at each end is field-bolted, and the stabilizer plate restrains each end of the bottom cord.
2. When Constructability does not does not allow a steel joist to be installed at the column:
    a. Stability equivalent to K.1 of this section shall be provided, designed by a qualified person, be shop installed, and be included in erection drawings.
    b. Hoisting cables shall not be released until the seat at each end of the joist is field-bolted and the joist is stabilized.
3. Design steel joists at or near columns spanning 60 ft. (18.3 m) or less with sufficient strength to allow one person to release the hoisting cable without the need for erection bridging.
4. Steel joists spanning more than 60 ft. (18.3 m) shall be set in tandem with all bridging installed unless a qualified person determines an alternative method providing equivalent stability and the method is included in the site-specific erection plan.
5. Do not place steel joists and girders on a support structure until it has been stabilized.
6. Secure steel joists landed on a structure prior to installation, to prevent unintentional displacement.

7. Make no modification to a steel joist or girder, which would affect its strength, without the approval of the project structural engineer of record.
8. Connections of individual steel joists to structures in bays of 40 ft. (12.2 m) or more shall be fabricated to allow for field bolting unless the joists have been pre-assembled into panels.
9. Steel joists and girders shall not be used as an anchorage point for a fall arrest system without written approval obtained from a qualified person.
10. A bridging terminus point shall be established before bridging is installed.
11. Attachment of Steel Joists and Steel Joist Girders. Each end of "K" series steel joists shall be attached to the support structure with a minimum of two 1/8-inch (3 mm) fillet welds 1 in. (25 mm) long or with two ½-inch (13 mm) bolts, or equivalent.
    a. Attach each end of "LH" and "DLH" series steel joists and girders to the support structure with a minimum of two ¼-inch (6 mm) fillet weld 2 in. (51 mm) long, or with two ¾-inch (19 mm) bolts, or equivalent.
    b. Steel joists shall be attached to the support structure with at least one end on both sides of the seat, immediately upon placement and before additional joists are set.
    c. Pre-assembled steel joist panels with bridging shall be attached to the structure at each corner before releasing the hoisting cable.
12. Steel Joist Erection. Joists over 60 ft. shall be attached at both ends as specified in paragraph 13 and the provisions of paragraph 15 of this section shall be met before releasing the hoisting cables.
    a. Only one person shall be allowed on steel joists not requiring erection bridging under Tables A and B until all bridging is installed and anchored.
    b. Personnel shall not be allowed on steel joists where the span of the joist is greater than shown in Tables A and B.
    c. When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points shall be required to provide stability.

Table A -- Erection Bridging for Short Span Joists

JOIST	Span	JOIST	Span	JOIST	Span
8L1	NM	20K10	NM	30K7	44-0
10K1	NM	22K4	34-0	30K8	45-0
12K1	23-0	22K5	35-0	30K9	45-0
12K3	NM	22K6	36-0	30K10	50-0
12K5	NM	22K7	40-0	30K11	52-0
14K1	27-0	22K9	40-0	30K12	54-0
14K3	NM	22K10	40-0	10KCS1	NM
14K4	NM	22K11	40-0	10KCS2	NM
14K6	NM	24K4	36-0	10KCS3	NM
16K2	29-0	24K5	38-0	12KCS1	NM
16K3	30-0	24K6	39-0	12KCS2	NM
16K4	32-0	24K7	43-0	12KCS3	NM
16K5	32-0	24K8	43-0	14KCS1	NM
16K6	NM	24K9	44-0	14KCS2	NM
16K7	NM	24K10	NM	14KCS3	NM
16K9	NM	24K12	NM	16KCS2	NM
18K3	31-0	26K5	38-0	16KCS3	NM
18K4	32-0	26K6	39-0	16KCS4	NM

JOIST	Span	JOIST	Span	JOIST	Span
18K5	33-0	26K7	43-0	16KCS5	NM
18K6	35-0	26K8	44-0	18KCS2	35-0
18K7	NM	26K9	45-0	18KCS3	NM
18K9	NM	26K10	49-0	18KCS4	NM
18K10	NM	26K12	NM	18KCS5	NM
20K3	32-0	28K6	40-0	20KCS2	36-0
20K4	34-0	28K7	43-0	20KCS3	39-0
20K5	34-0	28K8	44-0	20KCS4	NM
20K6	36-0	28K9	45-0	20KCS5	NM
20K7	39-0	28K10	49-0	22KCS2	36-0
20K9	39-0	28K12	53-0	22KCS3	40-0
22KCS4	NM	26KCS2	39-0	28KCS4	53-0
22KCS5	NM	26KCS3	44-0	28KCS5	53-0
24KCS2	39-0	26KCS4	NM	30KC53	45-0
24KCS3	44-0	26KCS5	NM	30KCS4	54-0
24KCS4	NM	28KCS2	40-0	30KCS5	54-0
24KCS5	NM	28KCS3	45-0		

NOTE: NM = diagonal bolted bridging not mandatory for joists under 40 feet.

Table B -- Erection Bridging for Long Span Joists

Joist	Span	Joist	Span	Joist	Span
18LH02	33-0	24LH11	NM	36LH09	57-0 through 60-0
18LH03	NM	28LH05	42-0	36LH10	NM through 60-0
18LH04	NM	28LH06	46-0	36LH11	NM through 60-0
18LH05	NM	28LH07	NM	36LH12	NM through 60-0
18LH06	NM	28LH08	NM	36LH13	NM through 60-0
18LH07	NM	28LH09	NM	36LH14	NM through 60-0
18LH08	NM	28LH10	NM	36LH15	NM through 60-0
20LH07	NM	32LH09	NM through 60-0		
20LH08	NM	32LH10	NM through 60-0		
Joist	Span	Joist	Span		
20LH09	NM	32LH11	NM through 60-0		
20LH10	NM	32LH12	NM through 60-0		
24LH03	35-0	32LH13	NM through 60-0		
24LH04	39-0	32LH14	NM through 60-0		
24LH05	40-0	32LH15	NM through 60-0		
24LH06	45-0	36LH07	47-0 through 60-0		
24LH07	NM	36LH08	47-0 through 60-0		
24LH08	NM	24LH10	NM		
24LH09	NM	32LH09	NM through 60-0		
20LH07	NM	32LH10	NM through 60-0		
24LH10	NM	32LH11	NM through 60-0		

NOTE: NM = diagonal bolted bridging not mandatory for joists under 40 feet.

13. Erection Bridging.
    a. Where the span of the steel joist is equal to or greater than shown in Tables A and B:
        i. A row of bolted diagonal erection bridging shall be installed near the mid span of the steel joist;
        ii. Hoisting cables shall not be released until the diagonal erection bridging is installed and anchored; and
        iii. Only one person shall be on the span until all other bridging is installed and anchored.
    b. Steel joists spanning 60 ft. (18.3 m) to 100 ft. (30.5 m) shall require:
        i. All bridging rows shall be bolted diagonal bridging;
        ii. Two rows of bolted diagonal bridging be installed at each of the one-third points of the span;
        iii. Hoisting cables remain connected and be released only after this bridging is installed and anchored; and
        iv. Only two personnel shall be allowed on these spans until all other bridging is installed and anchored.
    c. Steel Joists spanning more than 100 ft. (30.5 m) through 144 ft. (43.9 m), the following shall apply:
        i. All rows of bridging shall be bolted diagonal bridging;
        ii. Hoisting cables shall not be released until all bridging is installed and anchored; and
        iii. Only two personnel shall be allowed on these spans until all bridging is installed and anchored.
    d. Steel members spanning more than 144 ft. (43.9 m), shall be erected in accordance with part H, “Beams and Columns”, of this section.
    e. Any steel joist, which is a bottom chord-bearing joist, shall have bolted diagonal bridging installed and anchored near the support (s) before the hoist cable (s) is released.
    f. When bolted diagonal bridging is required:
        i. The bridging shall be indicated on the erection drawing;
        ii. The erection drawing shall be the exclusive indicator of the proper placement;
        iii. Shop-installed bridging clips or equivalents shall be used where the bridging bolts to the steel joist;
        iv. When attaching two or more pieces of bridging by a common bolt, the nut securing the first piece of bridging shall not be removed from the bolt for the attachment of the second; and
        v. Bridging attachments shall not protrude above the top chord of the steel joist.
    g. Landing and Placing Loads
    h. Loads placed on steel joists shall be distributed so as not to exceed the carrying capacity of any steel joist.
    i. No loads are allowed on steel joists until all bridging is installed and anchored, and all joist-bearing ends ate attached.

j. A bundle of joist bridging shall not exceed 1,000 lbs. (454 kg) total weight. The bundle shall be placed on at least three joists, each secured at one end, and positioned within 1 ft. (.30 m) of the secured end.
k. Bundles of decking shall not be placed on steel joists until all bridging has been installed and all joist bearing ends attached, except where:
    i. The decking bundle is place on a minimum of three steel joists;
    ii. The joists supporting the decking bundle are attached at both ends;
    iii. At least one row of bridging is installed and anchored;
    iv. The total weight of the bundle shall not exceed 4,000 lbs. (1818 kg); and
    v. Placement of the bundle shall be within 1 ft. (.30 m) of the bearing surface of the joist end.
    vi. The edge of the construction load shall be placed within 1 ft. (.30 m) of the bearing surface of the joist end.

Q. Systems-Engineered Metal Buildings

1. Each structural column shall be anchored by a minimum of four anchor rods (anchor bolts).
2. Rigid frames shall have 50 percent of their bolts or the number of bolts specified by the manufacturer (whichever is greater) installed and tightened on both sides of the web adjacent to each flange before the hoisting equipment is released.
3. Construction loads shall not be placed on any structural steel framework unless such framework is safely bolted, welded or otherwise adequately secured.
4. In girt and eave strut-to-frame connections, when girts or eave struts share common connection holes, at least one bolt with its wrench-tight nut shall remain connected to the first member unless a manufacturer-supplied, field-attached seat or similar connection device is present to secure the first member so that the girt or eave strut is always secured against displacement.
5. Both ends of all steel joists or cold-formed joists shall be fully bolted and/or welded to the support structure before:
    a. Releasing the hoisting cables;
    b. Allowing workers on the joists; or
    c. Allowing any construction loads on the joists.
6. Purlins and girts shall not be used as an anchorage point for a fall arrest system unless written approval is obtained from a qualified person.
7. Purlins may only be used as a walking/working surface when installing safety systems, after all permanent bridging has been installed and fall protection is provided.
8. Construction loads may only be placed in a zone located within 8 feet of the centerline of the primary support member.

STEEL ERECTION COORDINATION CHECKLIST

Project Name: _____ Contract #: _____

Date: _____ Contractor: _____

GENERAL CONTRACTOR REQUIREMENTS		YES	NO
1	The steel erector has been provided a copy of the Job Hazard Analysis requirements for the project.		
2	The steel erector has been provided a copy of the Steel Erection Safety Procedures for the project.		
3	Concrete or mortar in footings piers and/or walls has obtained either:		
	a. 75% of intended minimum compressive design strength		
	b. Sufficient strength to support loads imposed during steel erection activities.		
4	Test results (ASTM Standard) for Item 4 have been provided to the steel erector.		
5	Anchor bolt modification or field repairs:		
	a. Field modifications or repairs to anchor bolts have not been performed.		
	b. Anchor bolts modifications have been performed.		
	c. All modifications to anchor bolts have been made with the acceptance of the Engineer.		
6	Access to the site for all applicable equipment, and supplies have been established and will be maintained.		
7	Vehicle and pedestrian traffic through the steel erection activity will be restricted.		
8	Firm, graded, drained, area (s) have been provided for steel erection activities.		
9	Site access below the steel erection activities will be limited to those of the steel erectors personnel only.		
10	Through a documented process, the Contractor will accept responsibility of the perimeter safety cable system installed by the steel erector after the steel erector has finished their work.		
11	The steel erector has been provided with written authorization to begin the steel erection process.		
STEEL ERECTOR REQUIREMENTS		**YES**	**NO**
1	The erector has submitted a copy of their Job Hazard Analysis.		
2	The erector has submitted a written Fall Protection Work Plan.		
3	The erector has submitted a copy their Site-Specific Erection Plan.		
4	The erector has submitted the names and designated responsibilities of their competent persons (s), qualified rigging personnel, and crane operator.		
5	Annual safety certification of their hoisting equipment, proof of controlled lowering device and manufactures recommendations concerning multiple lift rigging.		
6	Copies of training records in reference to Fall Protection, Connecting procedures and Multiple Lifts as found in Part H of this section.		

General Contractor's Project Manager _____

Steel Erector's Project Manager _____

A. Scope
This section defines the minimum safety procedures for tower, lattice boom, and mobile cranes, boom trucks or any hoisting devices working on the Port of Seattle construction projects.

B. Purpose
To prevent injury or property damage to facilities or equipment from unsafe or unqualified operation of lifting equipment.

C. Reference
ANSI B30-2010, ANSI/ASSE 10.310-2006, ASME B30-2010, 29 CFR 1926 subpart N, WAC 296-155 Part L.

D. Definitions
Accredited Crane Certifier - A crane inspector who has been accredited by the department of Labor and Industries.

AOA – Air Operations Area that encompasses the entire airport area.

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

Crane Activity Plan – A checklist completed by the Contractor and the Crane company/operator prior to the beginning of work.

Crane-Power-Operated equipment used in construction that can hoist, lower, and horizontally move a suspended load.

Critical Pick – Any lift exceeding 75% of the cranes rated capacity (depending on manufacturer's specifications), any lift involving more than one crane, or any lift involving unusual or severe circumstances.

FAA – Federal Aviation Authority

Hoist (or hoisting) - All crane or derrick functions, such as lowering, lifting, swinging, booming in and out or up and down, or suspending personnel platform.
Hoisting Equipment – For the purpose of this section refers to boom trucks, cranes, and derricks.

Qualified Crane Operator - a crane operator who meets the requirements established by the department under RCW 49.17.430.

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, the work, or project.

Qualified Rigger is a rigger who meets the requirements in WAC 296-155-53306.

Qualified Signal Person is a signal person who meets the requirements in WAC 296-155-53302.

Two-Blocking - The condition in which the load block or hook assembly is drawn tight to the boom point.

E. General Requirements

1. It is the responsibility of the Contractor to ensure that all subcontractor, sub-tier, and vendors performing work under this section are briefed on its contents prior to beginning work.
2. All hoisting and rigging activities require a written task plan prior to commencing. Please refer to the "Pre-Lift Task Plan" on page 122.
3. The Contractor shall comply with all manufacturer's specifications, limitations, and recommendations applicable to the operation of the crane, boom, or derrick.
4. All hoisting equipment shall have a copy of the manufacturer's Manual for that make and model in the crane.
5. Operators of hoisting equipment shall possess certification for the type of crane to be operated, issued by a crane operator testing organization accredited by a nationally recognized accrediting agency.
6. Capacity rating chart(s) shall be provided with each crane and attached in a location accessible to the operator while at the controls.
7. The total load shall not exceed the hoisting equipment rated capacity specified in the equipment load charts or the rigging capacity specified in the rigging-rating chart.
8. All cranes shall be equipped with "Anti-Two-Blocking" devices.
9. A fire extinguisher rated at least 5:BC shall be located in each cab of the crane.
10. All cab glass shall be safety glass and distortion free.
11. No modifications or additions, which affect the capacity or safe operation of the equipment, shall be made without the manufacturer's written approval.
12. The headache ball, hook, or load shall not be used to transport personnel.
13. The use of a crane or derrick to hoist employees on a suspended work platform is prohibited under normal circumstances. Only when the erection,

use, dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions. Refer to this Manual for specific requirements.

14. Airport Projects: Cranes or booms capable of becoming an obstruction shall not be allowed on the AOA unless approved by the FAA Form 7460 process. This form is available through the Port of Seattle Resident Engineer.
15. Airport Projects: All hoisting equipment left on or near the AOA, at night shall have their boom lowered or be equipped with warning systems that meet FAA requirements.
16. Seaport Projects: Mobile cranes on barges shall be positively secured.
17. Duties of assigned personnel. All assignments listed below must be documented in the worksite organization. (A single individual may perform one or more of these assignments concurrently.) WAC 296-155-53401
    Crane Owner: Has custodial control of a crane by virtue of lease or ownership.
    Crane User: Arranges the crane's presence on a worksite and controls its use there.
    Site Supervisor: Exercises supervisory control over the worksite on which a crane is being used and over the work that is being performed on that site.
    Lift director: Directly oversees the work being performed by a crane and the associated rigging crew.
    Crane Operator: Directly controls the crane's functions.

F. Inspections
    1. Inspection are divided into two general classifications:
        a. Daily -performed by a Competent Person daily.
        b. Annual Certification - performed by an accredited crane certifier at one to twelve month intervals.
    2. A copy of the current Annual Crane Certification must be submitted to the Engineer prior to the crane being brought on site. A copy of the crane certification must be on the crane and available on request.
    3. The Contractor shall designate a person who shall perform the daily inspections of the crane.
    4. All inspections shall be documented in writing and kept in the cab of the crane.
        a. In addition to crane systems and equipment, the inspection shall include ground conditions around the hoisting equipment for proper support, including ground settling under and around outriggers, ground water accumulation, or similar conditions.
    5. Any deficiencies observed shall be corrected before use continues.

G. Operation

1. Each operator shall be held responsible for those operations under their direct control. Whenever there is any doubt as to safety, the operator shall consult with the supervisor before handling the load.
2. The operator shall not engage in any practice that will divert his attention while actually engaged in operating the crane.
3. The stability of the ground, soil compaction, and type shall be considered when setting up a crane.
4. Cranes shall be set-up within 1 degree of level.
5. When outriggers are deployed "pads" shall be placed under each outrigger.
6. Accessible areas within the swing radius must be barricaded to prevent employees, vehicles, or material from being struck by, or caught in pinch points between rotating and stationary parts of the crane.
7. No crane or other equipment shall be operated within 10 ft. of energized electrical transmission, distribution, or power lines. For lines greater than 50kV, the distance shall be in accordance with WAC 296-155-53408. A Qualified Signal Person shall be designated to observe clearance and provide warnings when working in such situations.
8. The operator shall respond to signals from the Qualified Signal Person who is directing the lift. When a signal person is not utilized the operator is responsible for the lift. However, the operator shall obey a stop signal at all times, no matter who gives it.
9. An illustration of hand signals shall be posted on the crane.
10. Loads shall not be hoisted or suspended over personnel or live traffic areas.
11. Loads shall not be suspended from an unattended crane.
12. Loads must be guided and prevented from swinging by the use of a tagline for control.
13. Operations involving "side loading" of the crane are prohibited.
14. The hoisting of multiple loads or "Christmas treeing" is only permissible during steel erection.
15. The total load shall not exceed the hoisting equipment capacity specified in the equipment load charts or the rigging capacity specified in the rigging-rating chart.
16. Before traveling a crane with a load, it shall be determined that the practice is not prohibited by the manufacturer. If it is not, the boom should be carried in line with the direction of the travel and tag or restraint lines used to stabilize the load.
17. A "Critical Pick" is defined as any lift exceeding 75% of the crane's rated capacity based on the load chart and crane certification, any lift involving more than one crane, or any lift involving unusual or severe circumstances. Factors such as; excessive weight, shape or size, rigging, and weather or ground conditions, shall be considered before hoisting. Prior to such work beginning, the Contractor shall submit a written plan to the Engineer. Please refer to the "Critical Lift Planning Sheet" section.

H. Tower Cranes

1. Tower cranes shall be erected, jumped, and dismantled under the immediate supervision of a Competent Person, designated by the employer.
2. Employees involved in the erection, jumping or dismantling of tower cranes shall be protected against falling at heights of six foot or greater.
3. Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be designed by the manufacturer or a registered professional engineer. Prior to erecting a tower crane on a nonstandard tower crane base/structural support, the employer must ensure that the engineering configuration of this base/structural support has been reviewed and acknowledged as acceptable by an independent registered professional structural engineer (RPSE), licensed under chapter 18.43 RCW. An RPSE must certify that the crane foundation and structure.
4. The accredited crane certifier must verify a registered professional structural engineer, licensed under chapter 18.43 RCW, has certified that the crane foundations/structural supports and underlying soil are adequate support for the tower crane with its maximum overturning moment.
5. Tower cranes erected on new foundations shall be in in accordance with the manufacturer's recommendations when installing, erecting, and dismantling. If the manufacturer's recommendations are not available, follow the requirements in ASME B30.3-2009.
    a. After the crane has passed the visual and operational tests, the accredited crane certifier must ensure a proof load test is conducted and must be performed according to the manufacturer's recommendations. This test must be documented on the form or in the format approved by the Department of Labor and Industries.
    b. A record of each test shall be made and signed by the person responsible for conducting the test. Such records shall be maintained on the site for the duration of the work for which the crane was erected and become part of the form’s permanent records.
6. Tower cranes shall be positioned whereby they can swing 360 degrees without the counterweight or jib striking any building, structure or object, except:
    a. If the crane can strike an object or another crane, suitable limit switches shall be installed which will prohibit contact with such objects, or:
    b. Direct voice communications shall be established between any operator of crane(s) involved and the Qualified Signal Person so stationed where the boom and/or counterweight movement, and the object with which it may contact can be observed so that the operator(s) can be warned of imminent danger.
    c. A secondary means of positive communications shall be established as a back-up for possible direct voice communication failure.

   d. Radio communication systems without tone coded squelch are prohibited. Citizens band radios shall not be used as a means of communications for tower cranes.
7. Limit switches shall be installed and shall be kept adjusted.
8. The crane shall not be used to remove piling, loosen form work, or pull loads away attached to the ground or walls.
9. All electrical equipment shall be properly grounded and protection shall be provided against lightening.
10. All crane brakes shall set automatically in the event of a power failure.
11. Tower cranes shall be inspected and maintained in accordance with the manufacturer's recommendations.
12. Employees required to perform duties on the horizontal boom shall be protected against falling by guardrails or by the use of a full body harness and lanyards attached to the crane.

I. Crane Operations and Wind Speeds
1. Avoid operating cranes, booms, or derricks in high winds.
2. All Contractors shall be knowledgeable of the operating limits set by the crane manufacturer in regard to maximum permissible wind speeds.
3. Wind and other factors such as boom length, boom angle, size, and weight of the load being lifted can affect crane stability and crane structures. Wind blowing against the load and boom produce side load on the boom, reducing its capacity.
4. If work must be performed under these conditions, reduce capacities considerably below those shown on the rating chart.
5. Hoisting devices should be equipped with an electronic device to measure wind speeds, installed per the manufacturer's recommendations.
6. Airport Projects: If the wind speed cannot be determined at the site, the FAA shall be consulted for the wind speed on the airfield. The wind speed given by the FAA will be the speed that the Contractor shall adhere to in regard to crane operations.
7. A copy of the manufacturer's recommendations shall be kept in the crane.
8. In the absence of those recommendations, at wind speeds of 25 mph or greater, the use of the crane shall be suspended.
9. In addition, in absence of those recommendations, at 30 mph the boom shall be lowered and/or retracted.
10. Tower cranes shall not be erected or dismantled when wind speeds reach or exceed 20 mph.
11. When a tower crane is out of operation, the jib or boom shall be pointed downwind and the slewing brake shall be released so as to permit the jib or boom to weathervane, providing the jib or boom has a clear 360 degree rotation.
12. The use of a suspended work platform in winds in excess of 15 mph is prohibited if the manufacturer's recommendations are not available.

J. Rigging
   1. A Qualified Rigger shall perform all rigging actives.
   2. A Qualified Rigger shall inspect the rigging prior to each shift and during use. Damaged or defective rigging shall be immediately removed from the project.
   3. Material being hoisted shall be rigged to prevent unintentional displacement.
   4. All hooks that are manufactured to accept a safety latch shall be so equipped. Safety latches on all crane hooks and rigging, shall not be deactivated or made inoperable and be in good working order.
   5. When chain rigging is used for hoisting, the manufacturer's data tag must be attached.
   6. All slings in use must meet the applicable requirements for design, inspection, construction, testing, maintenance, and operation as prescribed in ASME B30.9-2010.
   7. All rigging hardware in use must meet the applicable requirements for design, inspection, construction, testing, maintenance, and operation as prescribed in ASME B30.26-2010.
   8. All rigging gear must be used in accordance with the manufacturer's recommendations or a qualified person.
   9. All below-the-hook lifting devices in use must meet the applicable requirements for design, inspection, construction, testing, maintenance, and operation as prescribed in ASME B30.20-2010.
   10. All hooks in use must meet the applicable requirements for design, inspection, construction, testing, maintenance, and operation as prescribed in ASME B30.10-2009.

K. Attachment: Hoisting Pre-Lift Task Plan page 122

L. Attachment: Critical Lift Planning Sheet page 123

Hoisting Pre-Lift Task Plan

Date: _____ Project Name: _____

Contractor: _____ Job: _____

Crane Service Provided By: _____

Mobilization/Verify
□ Crane capacity for the work
□ FAA Form 7460 requirements
□ FAA boom light or flag
□ Name of Competent Person
□ Copy of the annual inspection
□ Operating Manual is present
□ Inspection schedule
□ "Two Blocking" device
□ Wind speed device
□ NCCCO Certified Operator
□ Load Charts/Hand Signal postings
□ Location and ground conditions
□ Existence of overhead hazards
□ Energized electrical lines clearance verified

Rated line voltage: _____

Distance of lift to lines: _____

Designated Observer: _____

Operation
□ JHA completed
□ PPE for operator, flagger, signal person
□ Pre-lift meeting held
□ Crane within 1 degree of level or more stringent manufacturer recommendation
□ Pads under all outriggers
□ Swing radius barricaded
□ Work area properly illuminated
□ Signals via hand or radio
□ Work area properly barricaded
□ Weather conditions discussed
□ Wind speeds verified
□ Weight of lift verified
□ Tag lines utilized

Critical Pick
□ Does the lift meet the definition of "Critical"
□ Written plan submitted and accepted
□ Pre-lift meeting held

Tower Crane
□ PE certified foundation
□ Documented Load Test

Suspended Work Platform
□ Written plan submitted and accepted
□ Pre-Lift meeting held
□ Controlled lowering device on crane
□ Crane inspected prior to lift
□ Rigging inspected
□ Positive lock on hook throat
□ Additional safety line provided for rigging
□ Test lifts made and verified
□ "Anti-Two Block" or Equivalent

Rigging
□ Qualified Riggers
□ Qualified Signal Person
□ All rigging inspected prior to use
□ Capacity ratings visible
□ Rigging capacity verified for load weight
□ Hooks have functioning safety latches
□ Tag lines utilized
□ Multiple Lift Rigging

Other Considerations
□ Safety Orientation
□ Fall Protection/Work Plan
□ Protection of the public
□ Traffic Control Plan
□ Demolition
□ Fueling

_____
Contractor's Safety Manager

_____
Competent Person

_____
Crane Operator (NCCCO Certified)

_____
Crane Owner

_____
Crane User

_____
Lift Director

_____
Site Supervisor

Critical Lift Planning Sheet

Date:_____ Project: _____ Company: _____

Contact: _____ Phone: _____ Location: _____

Address: _____ City/State: _____

Job Description:	

Crane: _____

Rated Capacity: _____

Boom Length: _____

Jib Length: _____

Counterweight: _____

Weights: _____

Load: _____

Block: _____

Bars: _____

Slings / Rigging: _____

Shackles: _____

Misc: _____

TOTAL: _____

Lift Conditions: _____

Radius: _____

Boom Angle: _____

Chart: _____

% of Chart: _____

What is the condition of the rigging?
(new / strained / worn)

_____

Safety Considerations:
Pre-Lift Meeting:

Operator: _____ Signature _____ Print Name

Rigger: _____ Signature _____ Print Name

Supervisor: _____ Signature _____ Print Name

☐ Sketch Attached? ☐ Load Chart Attached? ☐ JHA Attached?

Suspended Work Platform

A. Scope
This section defines the minimum safety requirements for the use of Suspended Work Platforms used to lift personnel in combination with tower and mobile cranes.

B. Purpose
To prevent injury to personnel and ensure that proper procedures are being followed while the work is performed.

C. Reference
ANSI 30.5, 29 CFR Subpart N, WAC 296-155-528, and Cranes & Rigging section of this Manual.

D. Definitions
Controlled Load Lowering - A system or device on the power train, other than the load hoist brake, which regulates the rate of speed of the hoist mechanism during lowering.

Live Boom - A boom in which lowering is controlled by brake without aid from other lowering retarding devices.

Qualified Engineer - One who has a current engineering registration certificate and has successfully demonstrated the ability to design mechanical or structural objects.

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, the work, or project.

Hoist (or hoisting) - All crane or derrick functions, such as lowering, lifting, swinging, booming in and out or up and down, or suspending personnel platform.

Maximum Intended Load - The total load of all employees, equipment, tools, materials, transmitted loads, and other loads anticipated to be applied to a personnel platform or personnel platform component at any one time.

Rated Capacity – The maximum live load that an object has been designated to carry.

Two-Blocking - The condition in which the load block or hook assembly is drawn tight to the boom point.

E. Suspended Work Platform Procedures
   1. General
      a. The use of a crane or derrick to hoist employees on a personnel suspended work platform is prohibited under normal circumstances. Only when the erection, use, dismantling or conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.
         i. If the Contractor determines that the use of a suspended work platform is necessary, a meeting shall be held between the Contractor's Project Manager, Contractor's Safety Representative, the Engineer and a member of the Port of Seattle Construction Project Safety Group. A written plan, compiled by the Contractor and meeting the crane manufacturer's specifications will be submitted for review. The plan shall include at a minimum, the compelling reasons why conventional means and methods are not feasible or create a greater hazard, how the cranes instruments and components function, which type of positive acting device will prevent contact between the load block or ball and the boom tip, procedures for using a suspended work platform, and a Job Hazard Analysis. The Contractor or its designee shall be at the job site and produce documentation such as lift capacity information to verify that WAC 296-155-528 and OSHA 29 CFR 1926.550(g) requirements have been met.
         ii. All lifts shall be made in accordance with the manufacturer's lifting recommendations.
         iii. This operation/lift shall be documented
         iv. Operators of hoisting equipment shall possess certification for the type of crane to be operated, issued by a crane operator testing organization accredited by a nationally recognized accrediting agency.
         v. Requirements in Cranes & Rigging section shall be addressed.

F. Crane Requirements
   1. All load line hoist drums shall have a system or device (controlled load lowering) in addition to the load hoist brake that regulates the lowering rate of the hoist mechanism.
   2. Live boom equipment cannot be used to hoist personnel platforms.
   3. Load lines shall be capable of supporting, without failure seven times the maximum intended load.
   4. A positive acting device shall be used which prevents contact between the load or overhaul ball and the boom tip (anti-two-blocking device), or a system that deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

5. The total weight of the loaded suspended platform (with employees in the platform) and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane.
6. The crane or derrick shall be inspected immediately prior to suspending a work platform. Inspection shall include wire rope, hook brakes, boom, and other mechanical and rigging equipment vital to the safety of the operation. The inspection shall be performed at least once daily when the machine is being used in suspended work platform service.
7. Any structural or functional defect, which could adversely affect safe operation of the crane, shall be corrected before operation begins with a suspended work platform.
8. Cranes must be equipped with boom extension indicators and load radius indicators.
9. All locking devices, including hoist drum brakes, swing brakes, pawls, and dogs must be engaged when an occupied personnel platform is in a stationary work position.
10. All load line hoist drums shall have a system or device, in addition to the load hoist brake, that regulates the lowering rate of the hoist mechanism. Free fall is prohibited.
11. Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator readily visible to the operator.

G. Suspended Work Platform Design and Specifications
   1. Design
      a. All suspended platforms shall be in accordance with applicable OSHA/WAC standards and be designed by a Qualified Engineer competent in structural design.
      b. The weight of the empty platform and its rated capacity shall be permanently marked on the platform in a visible location.
      c. An access gate should be provided. The access gate shall swing inward and be equipped with a positive latch.
      d. The platform and rigging shall be inspected daily prior to being used.
   2. Platform Specifications
      a. Each personnel platform shall be provided with perimeter protection from the floor to 42 inches plus or minus 3 inches above the floor, which shall consist of either solid construction or expanded metal having openings no greater than ½ inch.
      b. A grab-rail shall be provided inside the personnel platform.
      c. Overhead protection shall be provided on the personnel platform when employees are exposed to falling objects.
      d. All rough edges exposed to contact by employees occupying the platform shall be ground smooth.
      e. All welding shall be performed by a welder who is qualified for weld types and material specified in the design.

H. Loading
   1. Suspended platforms shall be used only for employees, tools, and materials required to perform the work. Suspended work platforms shall not be used for transporting bulk materials.
      a. Materials or equipment on an occupied suspended platform shall be suitably secured and evenly distributed while the platform is being moved.
      b. The weight of employees, tools and materials to be hoisted shall not exceed the manufacturer's recommendation.
      c. An accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel with cranes with telescoping booms.
      d. The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them fully deployed following manufacturer's specifications when hoisting employees.
      f. Rated outrigger pads that are one and one-half (1 ½) the least dimension of the existing crane outrigger pad shall be used regardless of the footing surface.
   2. Rigging
      a. When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.
      b. Hooks on ball assembly, lower load blocks, or other attachment assemblies shall be equipped with a safety latch that can be closed and locked, eliminating the hook throat opening.
      c. Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.
      d. All eyes in wire rope slings shall be fabricated with thimbles.
      e. Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purposes when not hoisting personnel.
      e. A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle or equivalent device. It shall be securely fastened with a minimum amount of slack to the lift line above the headache ball or to the crane hook itself.
   3. Personal Protective Equipment
      a. Except over water, employees occupying the personnel platform shall use a full body harness system with lanyard attached to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

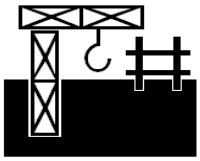
I. Work Practices
   1. Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.
   2. Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.
   3. Tag lines shall be used unless their use creates an unsafe condition.
   4. The operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.
   5. The platform shall not be used during winds in excess of 15 mph, electrical storms, snow or other adverse weather conditions that could endanger employees in the platform.
   6. Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone, such as by radio, may be used.

J. Trial Lift, Inspection, and Testing
   1. Trial Lift
      a. A trial lift with unoccupied personnel platform loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interference's exist; and that all configurations necessary to reach those work locations will allow the operator to remain under fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift may be loaded in the platform. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.
      b. The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless it is determined that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).
      c. After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:
         i. Hoist ropes shall be free of kinks.

ii. Multiple part lines shall not be twisted around each other.
iii. The primary attachment shall be centered over the platform.
iv. The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

2. Inspection
   a. A visual inspection of the crane or derrick, rigging, personnel platform, the crane or derrick base support, or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.
   b. Any defects found that create a safety hazard shall be corrected before hoisting personnel.
3. Testing
   a. Prior to hoisting employees on the personnel platform and after repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity. To accomplish this, hold in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, the competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

K. Pre-Lift Meeting
   1. A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review appropriate lifting procedures.
   2. This meeting shall be held prior to the trial lift at each new work location and be repeated for any employees newly assigned to the operation.



Personnel & Material Hoist

A. Scope
This section applies to Contractor operations that employ personnel and material hoists on the Port of Seattle construction projects.

B. Purpose
To establish minimum safety standards for the safe operation and maintenance of hoists.

C. Reference
WAC 296-155-77105, 29 CFR 1926.552

D. Definitions
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, the work, or project.

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.

Failure - Load refusal, breakage, or separation of components.

Load Refusal - The point where the ultimate strength is exceeded.

Maximum Intended Load - The total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

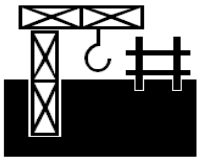
Rated Capacity – The maximum live load that an object has been designated to carry.

E. Personnel Hoists
1. Personnel hoists shall be provided for access on all structures where vertical travel is sixty feet or greater from a ground level access point.
2. Hoist towers outside the structure shall be enclosed for the full height on the side(s) used for entrance and exit to the structure. At the lowest landing, the enclosure on the side(s) not used for exit or entrance shall be enclosed to a

height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such scaffolds.

3. Towers inside the structure shall be enclosed on all four sides throughout the full height.
4. Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical, the tower shall be anchored by means of guys made of wire rope at least 1/2 inch in diameter, securely fastened to anchorage to ensure stability.
5. Hoist-way doors or gates shall be not less than 6' – 6" high and will be provided with mechanical locks that cannot be operated from the landing side and shall be accessible only to persons on the car.
6. An emergency stop switch marked "Stop" shall be provided in the car.
7. A personnel hoist operator shall be employed who is instructed in safe operating procedures.
8. The Contractor shall designate a Competent Person who shall inspect and maintained the hoist.
9. A call box or other means to summon the hoist operator shall be installed at each location where work is performed.
10. Overhead protective covering of 2-inch planking, ¾-inch plywood, or other solid material of equivalent strength shall be provided at the top of every personnel hoist.
11. The Contractor shall verify that safe conditions, procedures, and inspections are being maintained. Rated load capacities and special hazard warnings or instructions shall be posted on cars and platforms.
12. Smoking is prohibited on hoists.
13. A 10-pound ABC-rated fire extinguisher shall be secured inside personnel hoist for use in the event of an emergency.
    a. The Contractor's Qualified Person shall perform safety inspections and maintenance at regular intervals recommended by the manufacturer. Inspections shall specifically include:
        i. Condition of wire ropes or tieback.
        ii. Operations of car-arresting device in case of rope failure.
        iii. Operations of emergency STOP switch.
        iv. Operations of all safety controls.
        v. Entrances, enclosures, and signage.
    b. Washington State requires an inspection permit from the Department of Labor & Industry (elevator inspection).
    c. Copies of all inspections, tests, and maintenance documents shall be kept in the project file.

F. Material Hoists



Personnel & Material Hoist

1. Operating rules such as signal system and line speed for various loads shall be posted at the operator station and on the car. A "No Riders Allowed" sign shall be posted on the car and visible at every point of access.
2. No persons shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.
3. All entrances of the hoist-ways shall be protected by substantial gates or bars that guard the full width of the landing entrance. All hoist-way entrance bars and gates shall be painted with diagonal contrasting colors such as black and yellow stripes. Bars/gates shall be 2 x 4 woods or equivalent located at least two feet from the hoist-way with top between 36 and 42 inches above the floor, and feature a latching device.

   Hoist cage or platform shall have overhead protective covering of 2-inch planking or ¾ inch plywood.
4. All material hoists shall conform to the requirements of ANSI A10-5-1969.
5. Operator's station shall have overhead covering of tight planking at least 2 inches thick.
6. Non-Use of Hoist by Workers
   Workers on the job shall be instructed not to ride the material hoist. No person will be allowed to ride on material hoist except for the purpose of maintenance and inspection.

Elevating Work Platform

A. Scope
This section defines minimum the safety requirements for Contractors to follow while utilizing elevating work platforms on the Port of Seattle construction projects.

B. Purpose
This section is intended to define basic safety rules during the operation of elevating work platforms.

C. Reference
29 CFR 1926 Subpart L, WAC 296-24-875 WAC 296-869

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

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

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.

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 jobsites above ground:
    a. Extensible boom platforms;
    b. Aerial ladders;
    c. Articulating boom platforms;
    d. Scissor lifts
2. The Contractor shall allow only trained individuals to operate such equipment and shall maintain all documentation of training.
3. On a daily basis, before use, it shall be given a thorough inspection.
4. Lift controls shall 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 shall be removed from service until repaired.
6. Before it is elevated the operator must check the location of overhead obstructions.
7. Platforms shall maintain a minimum distance of ten (10) feet from energized overhead electrical lines.
8. Platforms utilized in areas subject to vehicle traffic shall be demarcated around the base.
9. Platforms utilized in areas frequented by other workers or the public shall also be demarcated around the base.
10. Certified flaggers and/or substantial barricade protection shall be used where lifts are subject to being struck by vehicles or equipment.
11. Wheels shall be chocked when parked on an incline.
12. Load limits specified by the manufacturer shall not be exceeded. Material to be lifted shall be contained inside the platform, basket, or on the manufacturers attachments. Guardrails shall not be used to support material.
13. Lifts shall 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 exiting 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 shall be secured in the lower traveling position by the locking device above the truck cab, and the Manually-operated device at the base of the ladder, or by other equally effective means (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 shall be worn and a lanyard attached to the point specified by the lift manufacturer when in operation.
2. Employees shall always stand firmly on the floor of the basket when moving the lift or working.
3. The brakes shall 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, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
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, the employee shall check for debris, un-tampered earth, drop-offs or holes.

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

3. Employees shall always stand firmly on the floor of the platform when moving the lift or working.
4. All guardrail sections shall be securely bolted to the machine.
5. The entrance rail or chain must be put in place once the employee has entered the lift.

Powered Industrial Truck

A. Scope
This section outlines minimum safety requirements to be followed by Contractor personnel operating and maintaining powered industrial trucks (forklifts) on the Port of Seattle construction projects.

B. Purpose
This intent of this program is to eliminate or minimize the potential for injury or property damage to personnel, equipment, and facilities.

C. Reference
29 CFR 1910.178, WAC 296-863, ANSI B56.1-1975, ASME B56.1-1993

D. Definitions
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.
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 the Contractor 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 the Contractor on or after March 1, 2000, must meet the applicable requirements of design, construction, and stability as defined in ASME B56.1-1993. The Contractor must 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 unscrubbed 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
    a. Due to the advances in technology and the availability of elevating work platforms, forklifts shall not be used to lift 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. The Contractor shall ensure that each powered industrial truck operator is trained in the safe operation of a 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), the Contractor must ensure that each operator has successfully completed the training required by this section.
    c. Operators must be in possession of 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: Any qualified person of the employer's choosing may give required training and evaluation.

    b. Training must consist of formal instruction and/or practical training, conveyed in a manner that the trainee understands.

NOTE: Formal instruction may include lecture, 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 operators 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. Retraining in relevant topics must 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 they are not operating the truck safely.
    d. The operator is assigned to drive a different type of truck.
    e. The condition of the workplace change in a manner that could affect the safe operation of the truck.

NOTE: Retraining must be provided to an operator if three years has elapsed since they last received training.

5. Avoidance and Duplicative Training. If an operator has previously received training in a topic specified in paragraph 3 of Training Program Content and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator can provide proof of such training has been within three years, and the Contractor can verify operator competency.
6. Record keeping
   Contractors shall keep records showing that each operator has been trained or received retraining as required by this section. These records shall include the name of the operator, the date of training or retraining, and the name of the person(s) giving the training or retraining.
7. Operator Identification. Operators who have successfully completed training shall be identified with a hardhat sticker that includes the date of course completion

G. Operating Powered Industrial Trucks

1. Industrial Trucks (Forklifts) shall be inspected at the beginning of each shift or when first used on that 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, the operator shall check the daily inspection sheet to ensure the inspection for that day has been completed. No operator may drive a truck up to anyone standing in front of a fixed object.
2. The truck shall have an audible reverse alarm.
3. No one may stand or pass under the elevated portion of any truck, whether loaded or empty.
4. Contractors must not allow persons to ride on industrial trucks unless the truck is equipped to do so.
5. Contractors must prohibit employees from placing any body parts between the uprights of the mast or outside the running lines of the truck
6. When an operator leaves the seat/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; and
   d. The brakes shall be set.
   e. If the truck is parked on an incline, the wheels shall be blocked.
7. The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car. Floor stops may be required.

8. There shall be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.
9. An active operator protection restraint device (such as a seatbelt or lap-bar) or system shall be used.

H. Traveling in a Powered Industrial Truck
1. The operator shall 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 shall look in the direction of, and keep a clear view of the path of travel.
5. Stunt driving and horseplay are prohibited.
6. The operator shall avoid running over loose objects on the roadway surface.

I. Traveling Speeds of Powered Industrial Trucks
1. The operator shall observe all traffic regulations, including authorized plant speed limits.
2. The operator shall slow down and sound the horn at cross aisles and other locations where vision is 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, it is not required.

3. The operator shall 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, the truck shall be operated at a speed that will permit it to be stopped safely.
5. The driver shall slow down for wet and slippery floors.
6. While negotiating turns, the operator shall 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 or safely arranged. Exercise caution when handling off-center loads that cannot be centered.

3. Take care when securing, manipulating, positioning, and transporting loads when attachments are used.
4. Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.
5. 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.
6. 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 shall be removed from service when not in safe operating condition. An authorized employee must make all repairs.
2. When repairs to fuel and ignition systems of industrial trucks involve fire hazards a fire extinguisher shall be available.
3. Industrial trucks in need of repairs to the electrical system must have the battery disconnected prior to such repairs.
4. Industrial truck parts must be replaced only by parts of equivalent safety.
5. Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured.
6. Trucks must not have additional counterweight added unless approved by the truck manufacturer.
7. Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease.

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 vehicle, 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.

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 between 1992-1998. 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%).

C. Reference

29 CFR Subparts O, P & W, WAC 296-155-605, WAC 296-155 Part E & M, and Excavation & Trenching section of this Manual.

D. General Requirements

1. The Contractor shall insure that only experienced, trained and qualified personnel are allowed to operate equipment.
    a. Proper licensing requirements such as Commercial Driver's License (CDL) shall be met.
    b. The operator must:
        i. Know, understand, and demonstrate the working limits and safe operation of the equipment, including any attachments.
        ii. Must be physically, emotionally, and mentally fit.
        iii. Must know and comply with the safety rules and attend at a minimum at least one toolbox safety meeting per week.
        iv. Must have read and understood the manufacturers operating instructions for the equipment they are operating.
        v. 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 equipment.
3. All personnel on the project shall utilize proper Personal Protective Equipment (PPE) as referenced in this Manual.

4. All equipment shall be inspected and serviced by a qualified mechanic on a pre-determined schedule. Such inspections shall be documented. A sample "Daily Checklist" is included in this section.
5. In the course of the work shift, it shall be operator's responsibility to report unsafe conditions that arise with the equipment or on the site.
6. Any equipment unsafe to operate shall be taken out of service and repaired.
7. All cab glass shall be safety glass, or the equivalent, that introduces no distortion.
8. Smaller vehicles such as pick-up and maintenance trucks shall 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 shall have seats firmly secured and adequate for the number of employees to be carried.
11. All equipment and heavy-duty vehicles shall 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. Backing of trucks with limited visibility shall have a spotter or video device to allow the vehicle operator to ensure that no workers are present in the area behind the vehicle and subject to being struck.
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 shall 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 shall not be moved until the operator is sure that all individuals are clear of the equipment.
18. Equipment operated near energized power lines shall follow the guidelines in WAC 296-155-428 (1) (E). All power lines shall be considered energized until supervision has verified that they are de-energized.
19. All vehicles shall have a service brake system capable of stopping and holding the equipment fully loaded an emergency brake system, and a parking brake system.
20. Equipment shall not be loaded beyond their rated capacities and all loads shall be secured to prevent shifting or loss.
21. When "breaker point", brush cutting, or other specialty attachments are utilized the Contractor shall follow the manufacturer's recommendations for cab/operator protection. Manufacturer's safety precautions shall be incorporated in the JHA.
22. No persons shall be permitted to remain in equipment that is being loaded by excavating equipment unless the cab is adequately protected against heavy impact.

23. Contractors shall have a procedure in place to deal with the hazards associated with "quick release" bucket mechanisms. A positive locking pin shall be placed to prevent accidental release if so equipped.

E. Maintenance, Repair, & Fueling

1. All equipment and vehicles in use shall 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. Seat and Seat Belt
   d. Windshields and Wipers
   e. Tires
   f. Reverse Alarm
   g. Horn
   h. Steering Mechanism
   i. Lights
   j. Steps and Handholds
   k. Hydraulic Hoses
   l. Fire Extinguisher

2. Heavy equipment or vehicles which are suspended or held aloft by the use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Likewise, bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment shall be either fully lowered or blocked when being repaired or not in use.
3. Equipment being repaired or adjusted shall have the key removed and a tag-out device placed on the control panel.
4. Only maintenance persons trained in the operation of equipment shall be allowed to move such equipment.
5. Equipment with obvious hydraulic, coolant, or oil leaks shall be promptly repaired.
6. Fuel storage and maintenance areas shall be kept clean and free of debris and spilled material. Oily and greasy rags shall be properly stored.
7. Proper fire protection, flammable liquid storage, and cutting and welding procedures shall be followed.
8. Gasoline powered engines shall 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 shall check in with the Contractor's supervision or grading supervisor.

3. Haul routes shall be built in accordance with WAC standards. Turnouts, emergency ramps, and berms shall be provided where needed.
4. Haul routes shall be properly maintained to prevent injury to employees and damage to equipment.
5. Where haul routes cross established roads or other haul routes, flaggers or warning signs shall be posted.
6. Berms or barricades shall be provided and maintained on roadways where drop –offs of sufficient grade or depth exist. They shall be at least mid-axle height of the largest equipment that travels the roadway.
7. Equipment speeds shall be appropriate to site and weather conditions if speed limits are not posted.
8. All equipment left unattended at night adjacent to a roadway in normal use, or adjacent to construction areas where work is in progress, shall be barricaded in conformance with the Uniform Traffic Code.
9. Everyone on the ground working around moving equipment shall wear high visibility vests or garments.
10. Before driving through or within an equipment operation, stop and observe long enough to become familiar with what equipment is working, or how much equipment is working.
11. When stopped to observe, be aware that material can come off of the top of the haul units, especially when they are in a turn.

G. Compaction Testing in Active Earthwork Fills

1. Technicians working among active earthmoving equipment shall utilize proper PPE including hard hats, high-visibility vest, and appropriate footwear.
2. 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 shall enter the fill areas by traveling with the flow of the equipment traffic, and take all prudent steps to avoid unsafe situations.
4. Technicians shall make contact with equipment operators and shall 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 shall communicate 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 shall promptly inform the 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. No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely, the movement of the equipment or vehicles involved.
2. Where trucks enter public highways, or cross-established routes, warning signs or flaggers shall be posted to alert the traveling public.
3. Equipment operated on public roads shall be equuipped with functioning lights, overhead beacon or strobe, and a slow moving vehicle placard. In addition, equipment shall be escorted by a vehicle liscensed for public roads when traveling from one location to another.
4. Before vehicles exit the project, they shall have had all loose or excess material removed.
5. All roadways used by the traveling public shall be kept clear of spilled material.
6. Drivers shall 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 regard 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: _____

Excavation & Trenching

A. Scope
This section defines minimum safety requirements for all open excavations made in the earth's surface located on the Port of Seattle construction projects. Excavations are defined to include trenches.

B. Purpose
To ensure that methods of protecting employees against cave-ins and safe work practices for employees during excavation and trenching operations are in place prior to work.

C. Reference
OSHA 29 CFR Subparts P & S, WAC 296-155 Parts N & Q, the Earthwork Activities and Confined Space Entry section of this Manual.

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

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.

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.

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.

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.

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 .

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.

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

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

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

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.

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

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.

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.

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.

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

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”.

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.

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.

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.

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

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

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 (4.6 m) (measured at the bottom of the excavation).

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”.

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 shall 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 shall be required. While the excavation/trench is open, underground lines shall be protected, supported, or removed as necessary to safeguard employees and the utilities.
   4. Employees in an excavation/trench shall 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 shall 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 shall 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 shall wear high visibility vests or garments.
   8. No employee shall be permitted underneath loads handled by lifting or digging equipment. No worker shall be permitted to remain in 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 shall be provided to ensure the stability of such structures for the protection of employees.

10. Adequate protection shall 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 shall be utilized around trenches and excavations.
12. If the excavation is exposed to vehicle or equipment traffic, berms or barricades shall 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 shall be provided where employees are required or permitted to cross over excavations. Standard guardrails shall be provided on walkways where the depth is 4 foot or greater. Ramps shall comply with WAC 296-155-24619 (1).
14. Upon completion of exploration and similar operations, temporary excavations, and shafts shall be back-filled.
15. Employees shall 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 shall 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

1. Per the Contractor Safety Responsibilities & Requirements section, the Competent Person shall be identified by name in the Contractor's Safety Program.
2. The Competent Person shall meet the definition set forth by OSHA.
3. The Competent Person shall be located on the project and be capable of classifying soils.
4. The Competent Person shall, as a minimum, perform and document daily inspections of the excavation and 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 shall 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 shall be conducted prior to the start of work and as required throughout the shift.
3. Inspections shall be performed after every rainstorm or as required by changing site conditions.
4. If conditions that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions are found, 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 in this section.

H. Confined Space Entry
   1. Excavations, pits, and trenches may be classified as confined spaces. The Contractor's Competent Person shall make the determination. The Port's procedures for Confined Space Entry can be found in this Manual.
   2. Emergency rescue equipment such as breathing apparatus, safety harness, lines, and basket stretcher shall be readily available where hazardous atmospheric conditions exist 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 shall be tested before employees enter excavations.
   4. The Contractor shall submit for acceptance a Contractor Health and Safety Plan (CHASP) for handling contaminated soils outlined within 02 61 13 – Handling Contaminated Soil 1.08.B.1.K.

NOTE: Port of Seattle Environmental may have important information regarding site conditions.

I. Protective Systems Requirements
   1. All employees in an excavation shall 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 shall have the capacity to resist without failure all loads that are intended, or could reasonably be expected to be applied, or transmitted to the system.
   3. Tabulated Data for such systems shall bear the stamp of a Professional Engineer and be located on the project.
   4. A 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 shall be free from damage or defects that may impair proper function.
   2. Manufactured materials and equipment used for protective systems shall be used and maintained consistent with manufacturer recommendations.
   3. When material or equipment that is used for protective systems is damaged, the Competent Person shall examine the material or equipment and evaluate its suitability for continued use.

K. Installation and Removal of Support
    1. Members of support systems shall be securely connected together to prevent sliding, failing, kick-outs, or other predictable failure.
    2. Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
    3. Removal shall begin at and progress from the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in or the sides of the excavation.
    4. Back filling of the excavation shall progress together with the removal of 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 members of the support system shall 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 shall extend 18” above the slope of the excavation to prevent material from rolling into the shield.
    3. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees, except when employees at the lower levels are adequately protected from hazards of falling material.
    4. Shield systems shall not be subjected to loads exceeding those that the system was designed to withstand.
        a. Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
        b. Employees shall not be allowed in shields when shields are being installed, removed or moved vertically.

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.

B. Definitions

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.

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

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

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

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

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

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

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

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

Stable Rock – Natural solid mineral that can be excavated with vertical sides and remains intact while exposed.
Submerged Soil – Soil that is underwater or is free seeping.

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

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:
   a. It is fissured; or
   b. Subject to heavy vibration from heavy traffic, pile driving, or similar effects; or
   c. 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.

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.

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 ¾:1.
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.

Excavation & Trenching

Excavation/Trenching Checklist

To be completed prior to any excavation or trenching work. This is an initial review of required procedures.

Job Name: _____ Date: _____ Time: _____

Competent Person: _____ Soil Type: _____

Excav./Trench Depth: _____ Excav./Trench Width: _____ Protective System: _____

General Site Conditions

Description	Yes	No	NA
Excavation, adjacent areas, and protective systems inspected by a designated competent person daily prior to start of work, or as hazards warrant.	❑	❑	❑
Competent person has the authority to remove employees from the excavation immediately and stop work.	❑	❑	❑
Surface encumbrances removed or supported.	❑	❑	❑
Employees protected from loose rock/soil that could pose a hazard by falling or rolling into the excavation.	❑	❑	❑
Spoils, materials, and equipment set back as least 2' from the edge of the excavation.	❑	❑	❑
Barriers provided at all remotely located excavations, wells, pits, shafts, etc.	❑	❑	❑
Walkways and bridges over excavations 6' (4' for WA) or more in depth are equipped with standard guardrails and toeboards.	❑	❑	❑
Warning vests or other highly visible clothing provided and worn by all employees exposed to vehicular traffic.	❑	❑	❑
Employees required to stand away from vehicles/equipment being loaded or unloaded.	❑	❑	❑
Employees are prohibited from going under suspended loads.	❑	❑	❑
Employees prohibited from working on the faces of sloped or benched excavations above other employees.	❑	❑	❑

Utilities

Description	Yes	No	NA
Utility company contacted and/or utilities located.	❑	❑	❑
Exact locations of utilities marked.	❑	❑	❑
Underground installations protected, supported, or removed when excavation is open.	❑	❑	❑

Means of Access & Egress

Description	Yes	No	NA
Unobstructed lateral travel to means of egress no greater than 25' in excavations 4' or more in depth.	❑	❑	❑
Ladders used in excavations secured and extended 3' above the edge of the trench.	❑	❑	❑
Structural ramps used by employees designed by a competent person.	❑	❑	❑
Structural ramps used for equipment designed by a registered professional engineer.	❑	❑	❑
Ramps constructed of materials of uniform thickness, cleated together on the bottom, and equipped with a no-slip surface.	❑	❑	❑
Employees protected from cave-ins when entering or exiting excavations.	❑	❑	❑

Wet Conditions

Description	Yes	No	NA
Precautions taken to protect employees from the accumulation of water.	❑	❑	❑
Water removal equipment monitored by a competent person.	❑	❑	❑

Surface wear or runoff diverted or controlled to prevent accumulation in the excavation.	❑	❑	❑
Inspections made after every rainstorm or other hazard increasing occurrence.	❑	❑	❑

Hazardous Atmospheres

Description	Yes	No	NA
Atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible, or other harmful contaminant posing a hazard.	❑	❑	❑
Adequate precautions taken to protect employees from exposure to an atmosphere containing less than 19.5 % or more than 23.5% oxygen and/or other hazardous atmosphere.	❑	❑	❑
Ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 10% of the lower explosive limit of the gas.	❑	❑	❑
Testing conducted often to ensure that the atmosphere remains safe.	❑	❑	❑
Emergency equipment, such as breathing apparatus, safety harness and lifeline, and/or basket stretcher readily available where hazardous atmospheres could or do exist.	❑	❑	❑
Employee trained to use PPE and rescue equipment	❑	❑	❑
Safety harness and lifeline used and individually attended when entering bell bottom or other deep confined excavations.	❑	❑	❑

Support Systems

Description	Yes	No	NA
Materials and/or equipment for support systems selected based on soil analysis, depth, width, and expected loads.	❑	❑	❑
Materials and equipment used for protective systems inspected and in good condition.	❑	❑	❑
Materials and equipment not in good condition have been tagged and removed from service.	❑	❑	❑
Damaged materials and equipment used for protective systems inspected by a registered professional engineer after repairs and before being placed back into service.	❑	❑	❑
Protective systems installed without exposing employees to the hazards of cave-ins, collapse, or threat of being struck by materials or equipment.	❑	❑	❑
Members of support system securely fastened to prevent failure.	❑	❑	❑
Support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.	❑	❑	❑
Excavations below the level of the base or footing supported and approved by a registered professional engineer.	❑	❑	❑
Removal of support systems progresses from the bottom and members are released slowly as to note and indication of possible failure.	❑	❑	❑
Backfilling progresses with removal of the support system.	❑	❑	❑
Excavation material to a level no greater than 2’ below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth.	❑	❑	❑
Shield system placed to prevent lateral movement.	❑	❑	❑
Employees are prohibited from remaining in shield system during vertical movement.	❑	❑	❑

Comments

Excavation & Trenching

Daily Excavation & Trenching Log

Job Name: _____ Date: _____ Time: _____

Location: _____ Competent Person: _____

Excav./Trench Depth: _____ Excav./Trench Width: _____ Exvac./Trench Length: _____

Protective System: _____ Weather: _____ Soil Type: _____

Protective system:
- ❑ Trench Shield (Box)
- ❑ Sloping
- ❑ Shoring
- ❑ Other_____

Purpose of excavation:
- ❑ Drainage
- ❑ Water
- ❑ Sewer
- ❑ Electrical
- ❑ Other_____

Were visual soil tests made: ❑ Yes ❑ No
If so, what type: _____
_____

Water conditions:
- ❑ Dry
- ❑ Wet
- ❑ Submerged

Hazardous atmosphere exists: ❑ Yes ❑ No
Action Plan: _____
_____

Confined Space Permit Required? ❑ Yes ❑ No

Follow Confined Space Program section

Is a ladder within 25' of all workers? ❑ Yes ❑ No

Is excavated material stored 2' or more from the edge of the excavation/trench? ❑ Yes ❑ No

Is excavation of materials to a level no greater than two feet below the bottom of the shield system. ❑ Yes ❑ No

Is an adequate barrier or physical protection warning system provided around the excavation? ❑ Yes ❑ No

Have all employees receive training in excavation & trenching? ❑ Yes ❑ No

Are sewer or natural gas lines exposed? ❑ Yes ❑ No

Are other utilities protected? ❑ Yes ❑ No

Are all surface encumbrances removed or supported as necessary to safeguard employees: ❑ Yes ❑ No

Is excavation/trenching exposed to public vehicular traffic? ❑ Yes ❑ No

If yes, have measures been taken to protect against exhaust fumes and are reflective vests, barricades, signage, etc. in place? ❑ Yes ❑ No

Action Plan:
_____
_____
_____
_____
_____
_____

Other:
_____
_____
_____
_____
_____
_____

Electrical Safety

A. Scope
This section defines the minimum safety requirements for low voltage electrical work on the Port of Seattle 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.

C. Reference
29 CFR 1926 Subpart K, WAC 296-155 Part I. NEC, WAC 800-280, Lock-out/Tag-out and Energized Electrical sections of this Manual and the Port of Seattle Lock-out/Tag-out Program.

D. Definitions
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”.)

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

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.

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.

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.

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.

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

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

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 overcurrent device protecting the circuit.)

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 overcurrent 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.

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.)”

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.

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

Device. A unit of an electrical system that is intended to carry but not utilize electric energy.

Disconnecting (or isolating) switch. (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

Electrical Outlets. Places on an electric circuit where power is supplied to equipment through receptacles, sockets and outlets for attachment plugs.

Enclosed. Surrounded by a case, housing, fence or walls that will prevent persons from accidentally contacting energized parts.

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.

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.

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”.)

Feeder**.** All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

Fuse**.** (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent 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.

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.

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 overcurrent protective device of the supply circuit.

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.

Isolated**.** Not readily accessible to persons unless special means for access are used.

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.

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.

Lighting outlet. An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

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.

Motor control center. An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

Overcurrent. 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 overcurrent protection are specific for particular situations.

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent 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".)

Power outlet. An enclosed assembly which may include receptacles, circuit breakers, fuseholders, 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.

Qualified person. One familiar with the construction and operation of the equipment and the hazards involved.

Receptacles**.** Outlets that accept a plug to supply electric power to equipment through a cord or cable.

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".)

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.

Service**.** The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

Service conductors. The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

Switchboard. A large single panel, frame, or assembly of panels that have switches, buses, instruments, overcurrent 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 "panelboard".)

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.

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.

Voltage. (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

Weatherproof. So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, 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. Contractors shall not permit an employee 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 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 Qualified Persons only, unless the equipment is de-energized or a Qualified Person is in supervision of the unqualified personnel making access.
3. Only Qualified Persons shall 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 shall be capable of working safely on energized circuits and shall 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 this Manual.

4. 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) shall not be worn if 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 Qualified Person may defeat an electrical safety interlock, and then only temporarily while they are working on the equipment. The interlock systems shall be returned to its operable condition when this work is completed.

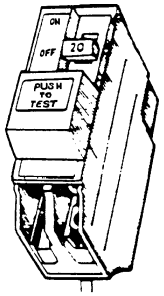
F. Working Near Energized Electrical Lines

1. Before work begins, the Contractor shall 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. The Contractor shall post and maintain proper warning signs where such an areas exists. The Contractor shall 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 bring employees into contact with those power lines shall begin until the location of the power lines has been positively identified.

4. Contractors shall not perform any work in proximity to electrical conductors or engage in any excavation, construction, demolition, repair, or other operation, until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.
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. The Contractor shall inspect and maintain the GFCI system. Documented inspections shall be monthly or more frequent as conditions dictate.
3. Temporary power supplied by the Contractor shall utilize GFCI.



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. The Contractor shall designate a Qualified Person 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 shall not be used and must immediately be tagged and removed from service and repaired by a Qualified Person.
3. The Contractor shall implement a cord management program that addresses: electrical cords running through access ways in a manner not to create trip and fall hazards; being run over by equipment; or being placed over sharp objects or subject to pinch points or other areas they may be damaged; and, cords being picked up on a daily basis.
4. Employee's hands shall not be wet when plugging and unplugging flexible cords and cord and plug connected equipment.
5. Extension cords or temporary lighting shall not be fastened with staples, hung from nails, or suspended by wire.
6. Power tools and portable equipment shall be handled in a manner that will not cause damage. Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment.
7. Cords passing through holes in covers, outlet boxes or similar enclosures shall be protected by bushings or fittings.
8. Cords shall not be used where run through holes in walls, ceilings, or floors or where concealed by walls ceilings or floors.
9. Cords may pass through doorways or other pinch points only if protection is provided to avoid damage.

I. Housekeeping
1. Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.
2. Electrically conductive cleaning materials (including conductive solids such as steel wool, metallic cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

J. Lighting & Illumination
1. Adequate lighting shall be provided throughout the building and in all work areas throughout the project, particularly passageways and strairways, and wherever necessary to avoid a hazard due to a lack of light.
2. The minimum level of task lighting for all indoor activities shall 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 activites shall be an average of five foot candles measured 30 inches above the floor or the task

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
Non-task 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.*		

4. Areas requiring the continuous use of temporary lighting shall be inspected regularly and defective lamps replaced.
5. Temporary lighting shall 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 and broken bulbs shall not be permitted.
8. High intensity task lighting shall not be left on after the work shift has concluded.

Hand & Power Tools

A. Scope
This section defines the minimum safety requirements for use of hand, power and powder actuated tools on Port of Seattle construction projects.

B. Purpose
To minimize hazards to employees due to improper use, worn, or damaged tools.

C. Reference
29 CFR 1926 Subparts I & Q, WAC 296-155 Parts G & O, WAC 296-800-280.

D. General
1. All hand and power tools and similar equipment whether furnished by the Contractor or the employee shall be maintained in a safe condition.
2. The Contractor shall not permit the use of unsafe tools. They shall be removed from service, tagged, and repaired.
3. When tools are designed to accommodate guards, they shall be equipped with such guards. Guards shall 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.
5. Equipment that can be electrically driven instead of gas or diesel is preferred.
6. All fuel-operated (diesel, gasoline) generators shall be located outside the building.
7. Fuel powered equipment placed outside of the building shall not be staged where the exhaust can be captured by air handling equipment or enter back into the building by other means.
8. The use of Liquid Propane (LP) below grade is prohibited by the either the Port of Seattle or Seattle Fire Department. Authorization to use LP Gas below grade shall be required by the governing fire department in writing.
9. LP equipment 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 the workers.

E. Hand Tools
1. Impact tools shall be kept free of mushroomed heads.
2. Wooden handles of tools shall be crack or splinter free and shall not be covered by tape.

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 shall operate the tool
2. Qualified operators shall have their operator's card in their possession while operating such equipment.
3. A lockable container shall be provided for each tool.
4. Signage shall be posted and maintained in plain sight where tools are used.
5. Loaded tools shall not be left unattended.
6. Proper hearing, eye, and face protection shall be utilized.
7. Tools shall be inspected prior to use.
8. Tools shall be used only on the recommended surfaces with the recommended loads - per manufacturer's instructions.
9. Unused or misfired loads must be properly disposed of.

H. Pneumatic Tools
1. Pneumatic power tools and hose sections shall be secured by threaded couplings or quick disconnect couplings or by 100 lb. tensile strength safety chain or equivalent across each connection to prevent the tool or hose connection from becoming accidently disconnected.
   a. Chicago couplings shall be pinned at the coupling(s).
   b. Whip checks shall be used at all hose-to-hose, hose-to-tool and compressor-to-hose connections.
2. Pneumatic hand tools shall 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 shall be protected to prevent vehicular damage.
4. Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 p.s.i.

I. Masonry Saws
1. Saws shall be guarded by a semicircular enclosure over the blade.
2. All table mounted saws shall 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 shall be grounded through conduit, water pipe, or a driven ground. Portable saws shall be guarded through a grounded electrical system and GFCI.

J. Come-A-Longs & Chain Falls
1. Damaged equipment shall not be used. Safety latches shall be maintained in working order.
2. A pick exceeding 75% of the rated capacity of the hoisting device is considered "Critical". A written plan shall be submitted to the Engineer before the work is performed.

Bloodborne Pathogen Exposure

A. Scope
This section defines minimum safety standards for personnel who are trained in first aid/cardiopulmonary resuscitation procedures as responders.

B. Purpose
First aid/CPR responders are deemed to have a reasonably anticipated exposure to blood, or other potentially infectious matter in the course of rendering first aid/CPR. It is the purpose of this section is to establish the means and methods to protect against such exposure.

C. Reference WAC 296-823

D. Infections
HBV—Hepatitis means “inflammation of the liver”. Hepatitis B virus is extremely contagious and is the major infectious blood borne hazard faced on the job. It infects approximately 8,700 health care workers a year, resulting in more than 400 hospitalizations and 200 deaths. The incubation period after exposure is from 1 to 6 weeks before onset of symptoms. At the onset flu-like symptoms occur, becoming so severe hospitalization may be required; or there may be no symptoms at all. Yet blood, saliva and other body fluids may be infectious. Urine will become dark in color, followed by jaundice (yellow color to eyes and skin). The liver becomes enlarged and in very serious cases it will become cancerous.

HIV—The Human Immune Deficiency Virus (AIDS), attacks the body’s immune system. Currently there is no vaccine to prevent infection. A person may carry the virus without developing symptoms for several years. They may suffer flu-like symptoms, fever, diarrhea and fatigue. The may develop AIDS-related illnesses including neurological problems, cancer and other opportunistic infections.

MRSA (Methicillin-resistant Staphylococcus aureus) - MRSA infection is caused by Staphylococcus aureus bacteria — often called "staph”. MRSA stands for methicillin-resistant Staphylococcus aureus. It is a strain of staph that is resistant to the broad-spectrum antibiotics commonly used to treat it. MRSA can be fatal.

E. Modes of Transmission
1. HBV and HIV are transmitted in the same ways in the work place, by body fluids such as saliva, semen, vaginal secretions and other fluids that contain blood. These fluids may enter your body through a variety of means including an accidental injury with a sharp object contaminated with infectious material. Open cuts, nicks and skin abrasions, even a rash or acne as well as the

mucous membranes of your mouth, nose or eyes can become a path of entry to your body. Indirect transmission can also occur from touching a contaminated object or surface and transferring the infectious material to your mouth, nose, skin, or eyes. HBV can survive on environmental surfaces dried at room temperatures for at least one week. Make sure after an accident that the area is thoroughly cleaned and disinfected.

2. MRSA Staph infections
   Staph bacteria are normally found on the skin or in the nose of about one-third of the population. If you have staph on your skin or in your nose but are not sick, you are said to be "colonized" but not infected. Healthy people can be colonized and have no ill effects. However, they can pass the germ to others. Staph bacteria are generally harmless unless they enter the body through a cut or other wound, and even then they often cause only minor skin problems in healthy people. However, staph infections can cause serious illness. This most often happens in older adults and people who have weakened immune systems, usually in hospitals and long term care facilities. However, in the past several years, serious infections have been occurring in otherwise healthy people in the community, for example athletes who share equipment or personal items.

F. Exposure Control Plan
   The risks of blood borne diseases in the work place are quite serious, yet there are effective ways of minimizing them. A good place to start is your employers written exposure control plan. This plan should identify the employees covered by the standard and the measures your company intends to take to minimize the risks. In the work setting, the persons with the highest risks are the medical personnel and safety personnel. Next in line would be first responders and anyone else who might be on the scene of an accident.

G. Methods of Control
   1. First treat all situations where there is blood or body fluids containing visible blood as if it were contaminated with an infectious disease. This is known as Universal Control.
   2. Isolating or removing hazards through the use of technology and devices is known as Engineering Control. e.g., puncture proof containers for used needles or minimizing exposure to sharp or jagged objects, etc.
   3. Alterations in the manner in which tasks are performed in an effort to reduce exposure are known as Work Practice Controls. Wash your hands as soon after exposure with a non-abrasive soap and water. Remove all contaminated clothing as soon as possible. Any assistance that is given to the injured should be done to minimize splashing, spattering or spraying.
      a. **What you can do in your community**
         Protecting yourself from MRSA in your community — which might be just

about anywhere — may seem daunting, but these common-sense precautions can help reduce your risk:

b. **Wash your hands.** Careful hand washing remains your best defense against germs. Scrub hands briskly for at least 15 seconds, then dry them with a disposable towel and use another towel to turn off the faucet. Carry a small bottle of hand sanitizer containing at least 60 percent alcohol for times when you do not have access to soap and water.
c. **Keep personal items personal.** Avoid sharing personal items such as towels, sheets, razors, clothing and athletic equipment. MRSA spreads on contaminated objects as well as through direct contact.
d. **Keep wounds covered.** Keep cuts and abrasions clean and covered with sterile, dry bandages until they heal. The pus from infected sores may contain MRSA, and keeping wounds covered will help keep the bacteria from spreading.
e. **Shower after athletic games or practices.** Shower immediately after each game or practice. Use soap and water. Do not share towels.
f. **Sit out athletic games or practices if you have a concerning infection.** If you have a wound that's draining or appears infected — for example, is red, swollen, warm to the touch or tender — consider sitting out athletic games or practices until the wound has healed.
g. **Sanitize linens.** If you have a cut or sore, wash towels and bed linens in a washing machine set to the "hot" water setting (with added bleach, if possible) and dry them in a hot dryer. Wash gym and athletic clothes after each wearing.
h. **Get tested.** If you have a skin infection that requires treatment, ask your doctor if you should be tested for MRSA. Doctors may prescribe drugs that are not effective against antibiotic-resistant staph, which delays treatment and creates more resistant germs. Testing specifically for MRSA may get you the specific antibiotic you need to effectively treat your infection.
i. **Use antibiotics appropriately.** When you are prescribed an antibiotic, take all of the doses, even if the infection is getting better. Do not stop until your doctor tells you to stop. Do not share antibiotics with others or save unfinished antibiotics for another time. Inappropriate use of antibiotics, including not taking all of your prescription and overuse, contributes to resistance. If your infection is not improving after a few days of taking an antibiotic, contact your doctor.

H. Personal Protective Equipment (PPE)
General - First aid/CPR equipment shall include the following items of protective equipment:

1. Gloves that will protect the skin from blood or other potentially infectious materials; Gloves shall be worn when the responder has the potential to have direct skin contact with blood or other potentially infectious body fluids or materials, or when handling items or surfaces soiled with blood or other potentially infectious body fluids or materials Gloves shall be changed when visibly soiled, torn, punctured or when their ability to function as a barrier is compromised. Gloves shall not be re-used.
2. Safety glasses equipped with side shields shall be worn if there is potential for splashing, spraying blood or other potentially infectious material
3. A face shield shall also be worn if there is a potential for splashing, spraying of blood or other potentially infectious material.
4. Mouthpieces or resuscitation bags shall be used to avoid “mouth-to-mouth” contact.
5. A disposable gown, apron or coverall will be utilized when there is the potential for splashing or spraying of blood or other potentially infectious materials on the work clothing.
6. Antiseptic hand cleanser and clean paper towel or cloth. Hands and other skin surfaces shall be washed immediately and thoroughly if contaminated with blood, potentially infectious body fluids or materials, or after handling soiled or contaminated equipment. Hands shall be washed immediately after gloves are removed.
7. Red biohazard bags shall be used for all blood soaked clothing, bandages or other infected items.

I. Hepatitis B Vaccination
Each responder shall be offered the opportunity to receive the Hepatitis B immunization vaccination. Information concerning the vaccination shall be covered in the training program. Responders shall be offered the vaccine within ten (10) days of the conclusion of their initial training. Those refusing the vaccine must sign a declination form.

1. HBV vaccine now being used in the USA is made from yeast and cannot be infected with HIV or other blood borne pathogen. The vaccine is perfectly safe and is administered in a series of 3 injections. The vaccine is 85 to 97 percent effective at protecting you from getting HBV or becoming a carrier for nine years or longer.

J. Procedures after Possible Exposure

1. If a worker suffers a needle stick, cut; mucous membrane (splash to eye, nasal mucous, or mouth); exposure; or has a skin exposure to blood when the workers skin is chapped, abraded, or otherwise non-intact, the employer shall

be informed of the incident. The worker shall be tested for HIV and HBV infections, after consent is obtained.

2. If consent is refused or if the employee tests positive, the individual shall be evaluated clinically and by HIV antibody testing as soon as possible and advised to report and seek medical evaluation of any acute febrile illness that occurs within 12 weeks after exposure. HIV zero negative workers shall be re-tested 6 weeks post-exposure and on a periodic basis thereafter (12) weeks and 6 months after exposure.
3. Follow-up procedures shall be taken for employees exposed or potentially exposed to HBV. The types of procedures depend on the immunization status of the individual (i.e. Whether HBV vaccination has been received and antibody response is adequate) and the HBV serologic status of the worker.
4. If an employee refuses to submit to the procedures in (2) or (3) above when such procedures are medically indicated, no adverse action can be taken on that ground alone since the procedures are designed for the benefit of the exposed employee.

K. Disposal of Wastes
   1. All blood soaked clothing, bandages or other materials shall be placed in red bags marked BIOHAZARD.
   2. If such bags are not available, tags shall be used as a means to identify potentially hazardous material. Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags shall contain a signal word and a major message. The signal word shall be BIOHAZARD or the biological hazard symbol. The major message shall indicate the specific hazardous condition to be communicated to the employee. The signal word shall be readable at a minimum of 5 feet or such greater distance as warranted by the hazard. They shall be attached by a positive means such as wire, string, or adhesive that prevents their loss.
   3. All materials shall be properly disposed of.

L. Recordkeeping basic requirement. You must record all work-related needle stick injuries and cuts from sharp objects that are contaminated with another person's blood or other potentially infectious material (as defined by chapter 296-823 WAC, Occupational exposure to bloodborne pathogens). You must enter the case on the OSHA 300 Log as an injury. To protect the employee's privacy, you may not enter the employee's name on the OSHA 300 Log (see the requirements for privacy cases in WAC 296-27-01119).
   1. What does "other potentially infectious materials" mean? The term "other potentially infectious materials" is in chapter 296-823 WAC, Occupational Exposure to BBP. These materials include:
      a. The following human body fluids: Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid,

peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

   b. Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and
   c. HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

2. Does this mean that I must record all cuts, lacerations, punctures, and scratches? No, you need to record cuts, lacerations, punctures, and scratches only if they are work-related and involve contamination with another person's blood or other potentially infectious material. If the cut, laceration, or scratch involves a clean object, or a contaminant other than blood or other potentially infectious material, you need to record the case only if it meets one or more of the recording criteria in WAC 296-27-01107.
3. If I record an injury and the employee is later diagnosed with an infectious bloodborne disease, do I need to update the OSHA 300 Log? Yes, you must update the classification of the case on the OSHA 300 Log if the case results in death, days away from work, restricted work, or job transfer. You must also update the description to identify the infectious disease and change the classification of the case from an injury to an illness.
4. What if one of my employees is splashed or exposed to blood or other potentially infectious material without being cut or scratched? Do I need to record this incident? You need to record such an incident on the OSHA 300 Log as an illness if:
   a. It results in the diagnosis of a bloodborne illness, such as HIV, hepatitis B, or hepatitis C; or
   b. It meets one or more of the recording criteria in WAC 296-27-01107.

Hearing Conservation

A. Scope
This section defines the minimum safety requirements for all Contractor's personnel exposed to Time Weighted Average (TWA) noise levels of 85 dBA or greater, areas with noise levels over 90 dBA, or equipment that generates noise levels in excess of 90 dBA.

B. Purpose
The Hearing Conservation Program is designated to protect against potential hearing loss by reducing or isolating personnel from exposure to potentially hazardous noise levels during the performance of their job.

C. Reference
WAC 296-817 and the PPE section of this Manual.

D. Definitions
Audiogram – The chart, graph, or table developed from hearing testing that documents a person's hearing threshold levels.

Audiogram, Baseline – A baseline test generally performed at the time of hire and/or prior to work site noise exposure, and is the test result against which all future audiograms are compared. **NOTE**: Baselines are adjusted after a Standard Threshold Shift (STS) has been confirmed and reported to the employee. The latest hearing test becomes the new Baseline Audiogram.

Audiogram, End-of-Exposure – The End-of-Exposure hearing test that is conducted after an individual leaves noise exposure due to change of jobs or termination of employment.

Decibel (dBA) - Unit of measurement for sound level, or sound pressure.

End-of-Exposure – End of noise exposure due to transfer, retirement, termination, or reduction in noise exposure due to implementation of noise controls.

Impulsive or Impart Noise – Intermittent noise levels (e.g. riveting, blasting, firearm discharge) that involve impulses or impacts. If intervals are greater than one second the noise levels are considered to be continuous.

Noise Dose – An individual's accumulated noise exposure over a specified time period (usually an 8 hour work shift). It is a ratio relative to a reference noise level of 90 dBA for an 8 hour period, which is equivalent to 100% of the allowable noise exposure.

Noise Dosimeter – An instrument that measures an individual's personal sound pressure exposure over a period of time. Such measurements of noise dose are expressed in percent.

Representative Exposure – Measurement of a given personnel's noise dose averaged, usually, over a period of eight (8) hours, and believed to be representative of other personnel in the work site.

Standard Threshold Shift (STS) – An average change in an individual's hearing acuity, relative to the baseline audiogram, of 10 dB or more at 2000, 3000, 4000 Hz in either ear.

Sound Level Meter – An instrument that measures an individual's sound pressure exposure instantaneously.

Time Weighted Average (TWA) – The time weighted means, or average, of sound levels. It is usually measured for an 8 hour period or work shift.

85 dBA – This noise level can be described as a noise level in which, if three feet apart, individuals must speak with raised voices. 85 dBA refers to 85 decibels measured on what is called an A-weighted sound level scale.

E. General Requirements
    1. Contractors shall actively participate in the Hearing Conservation Program by:
        a. Identifying high noise areas and equipment, as well as possible noise control methods.
        b. Ensure personnel are properly wear hearing protection in designated high noise areas or when operating high noise equipment/tools
        c. Ensure employees keep appointments for hearing tests, follow-up testing or medical referral.
    2. The Contractors primary responsibilities are:
        a. Perform noise monitoring (initially and when conditions change), and provide this information to hearing test provider.
        b. Train affected personnel regarding the Hearing Conservation Program.
        c. Provide personnel the opportunity to observe noise monitoring and provide noise measurement information to them.
        d. Document high noise level areas and equipment at each site.
        e. Implement feasible noise controls with appropriate outside assistance.
        f. Install appropriate warning signs for high noise areas and equipment.
        g. Maintain an "approved list" of hearing protection suitable for use.
        h. Ensure that personnel receive hearing tests and any appropriate follow-up designated by the Hearing Conservation Program.

i. Ensure that personnel that have experienced a Standard Threshold Shift (STS) on a hearing test are re-tested within 30 days of notification.
j. Maintain hearing test records.

F. Program Elements

1. Program Scope

WISHA has adopted an 8-hour Time Weighted Average (TWA) of less than 85 dBA. Contractors shall identify personnel exposed to noise at or above this level and include them in the Hearing Conservation Program. Additionally, personnel exposed to noise levels at or above 90 dBA in specifically definable areas (boiler rooms, emergency generator rooms, metal fabrication shops) or operating specifically identifiable equipment (power tools, jack hammers/high volume air compressors), shall be mandated to wear acceptable hearing protection devices.

G. Identification of Exposed Personnel & High Noise Areas/Equipment

1. Personnel potentially exposed to high levels of noise on the job are initially identified through interviews with supervisors, employees, safety committee members, fellow personnel and through a survey of the work area.
2. Representative noise monitoring of the individual, the work area or equipment shall be conducted with sound level meters or noise dosimeters.
3. Monitoring should be coordinated through the personnel's supervisor and the employee should be briefed on the monitoring process. Personnel should be given the opportunity to observe noise monitoring and will be informed of the monitoring results.
4. The job titles to which the Hearing Conservation Program currently apply shall be listed in the Contractor's Job Title Matrix. This Matrix should be revised periodically to reflect current employee noise levels.
5. The Contractor shall maintain a list of the work areas or equipment that have the potential for noise levels of 90 dBA or greater.

Table 1 - Noise Evaluation Criteria		
Criteria	**Description**	**Requirements**
85 dBA TWA_8	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	– Hearing protection – Training – Audiometric testing
90 dBA TWA_8	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	- Noise controls – Hearing protection – Training – Audiometric testing - Caution Signs posted
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Noise controls - Hearing protection - Training - Audiometric testing - Danger Signs posted
140 dBA measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

Table 2 - Examples of Task Specific Noise Readings		
Task	**Duration (hrs:min)**	**Max level (dBA) / 8-hr. dBA Reading**
Carbon Arc gouging and Grinding; welding	8.02	121.6 / 98.3
Pressure Washing	8.05	120.0 / 86.4
Inspector observing Sawcutting Concrete Panels	7:00	137.7 / 106.0
Lawnmower	7:52	102.9 / 76.9
Backhoe/Forklift	7:50	113.7 / 86.3

H. Noise Monitoring Methods

1. Dosimeters or sound level meters used for noise monitoring shall meet the requirements of the WISHA Hearing Conservation Standard.
2. The equipment shall be factory-calibrated according to the manufacturer's instructions, and be field calibrated before and after each test.
3. Monitoring results of all continuous, intermittent, and impulsive sound levels shall be integrated into the personnel's exposure records.
4. Monitoring shall be repeated whenever changes in production, process, equipment, or controls significantly alter the employee noise exposure.

5. Noise levels changing the hearing protection effectiveness shall also be re-evaluated.
    a. If these changes elevate the personnel's noise exposure to 90 dBA, Time Weighted Average (TWA) or greater, the feasibility of engineering noise controls must be re-evaluated.

I. Noise Controls
1. Whenever an individual's noise exposure equals or exceeds an 8-hour Time Weighted Average of 90 dBA, the feasibility of administrative or engineering controls must be determined and documented.
2. Feasible controls shall be implemented, even though the control may not reduce the personnel's exposure to less than a 90-dBA Time Weighted Average.

J. Warning Signs
1. Warning signs shall be posted to focus attention on areas and/or equipment that produce unusually high noise exposure levels. These signs shall warn personnel when hearing protection is required.
2. Caution signs shall be posted at entrances to or on the periphery of all work areas with noise levels at or above 90 dBA (e.g. emergency generator rooms, crane cabs, etc.).
3. Danger warning signs shall be posted at entrances to or on the periphery of all work areas with noise levels at or above 115-dBA.

NOTE: Warning signs in areas where noise is intermittent must indicate that hearing protection is required when equipment is operating. They must also be attached to or near tools, which operate above 90 dBA (e.g. table saws, routers, air compressors).

K. Hearing Protection Selection of Hearing Protection Devices:
1. Personnel shall be given the opportunity to select their hearing protection from at least two different types (molded, self-molded, custom-molded, or ear muffs).
2. Hearing protection shall be worn by personnel with the following exposures:
    a. An 8 hour Time Weighted Average of 85 dBA or greater
    b. Noise exposures of 90 dBA or greater within well-defined areas or generated from equipment noise.
    c. Any duration of noise greater than 115 dBA.
    d. Any duration of impulsive or impact noise at or above 140 dBA.
3. Evaluation of Hearing Protection Effectiveness:
    a. Hearing protection devices shall be evaluated in accordance with the Hearing Conservation Standard (WAC 296-62-09053m Appendix D), and ordered from the Contractor's "approved list".

b. Specific considerations shall include the hearing protections noise attenuation, suitability in the work environment, and interference with communication, durability, worker acceptance and sanitation.
c. Hearing protection shall also be evaluated to determine its effectiveness in reducing employee noise exposure to less than or equal to 85 dBA.
d. Each type of hearing protection carries a Noise Reduction Rating (NRR). This rating will be used in combination with the highest noise exposure in an area to determine the effectiveness of the hearing protection being used.

Use the procedure outlined in the following table to determine if a certain type of hearing protection is adequate for a given noise level:

Step	Action
1	Find the Noise Reduction Rating (NRR) of the hearing protection. **NOTE**: It should be listed on the container.
2	Subtract 7 from this number.
3	Subtract the remainder from the measured noise level for the area or equipment.
4	If the result is less than 85 dBA, the hearing protection is adequate for this application.

Example:
An employee is exposed to noise levels reaching 97 dBA. This employee is utilizing hearing protection with an NRR of 28.

28-7 = 21
97-21 = 76 dBA

The hearing protection is adequate for this level of noise exposure. If the number calculated using this method is greater than 85 dBA, the hearing protection is inadequate and better protection is required. In some cases double protection (ear muffs over ear plugs) may be required in order to reduce the personnel's noise exposure level to 85 dBA or less.

L. Audiometric Testing
    1. General
        a. Audiometric tests shall be performed by a licensed or certified audiologist, Otolaryngologist or other qualified physician, or by a technician who is certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC).
        b. A technician performing the tests must be responsible to an audiologist, Otolaryngologist or other qualified physician.
    2. Baseline and Annual Audiograms
        a. Personnel shall be given an initial hearing test or Baseline Audiogram within thirty (30) days of their first exposure to noise at or above a TWA of 85 dBA. Personnel will thereafter be given audiograms on an annual basis.
        b. Annual audiograms shall be compared with their current baseline to determine if a hearing loss has occurred. The result of each audiogram will be discussed with the employee immediately after the test.

Baseline Audiogram testing shall be preceded by at least fourteen (14) hours of quiet time (no loud noise exposure). This may be accomplished by the use of hearing protection. Supervisors must notify personnel of the need to avoid exposure by using the Noise Avoidance Notification Form (Appendix A).

    3. End-of-Exposure Audiograms
        a. Personnel who are no longer exposed to noise levels addressed by the Hearing Conservation Program (transfer, leave/retire, reduce noise levels through noise control) shall receive an End-of-Exposure Audiogram.
            i. For personnel remaining within the company, this can be the next regularly scheduled annual audiogram.
            ii. Personnel transferring to another company will be given their End-of-Exposure Audiogram within 30 days of their transfer from a noise-exposed position
        b. Testing for an End-of-Exposure Audiogram will also be preceded by at least fourteen (14) hours of quiet time (no loud noise exposure).
    4. Audiometric Evaluation and Employee Notification
        a. The audiogram test provider will compare an individual's Baseline Audiograms to the most recent audiogram to determine if a Standard Threshold Shift (STS) has occurred. A certified audiometric technician may make this comparison. An audiologist, Otolaryngologist or other qualified physician shall confirm that an STS has occurred, and whether or not further evaluation of the employee is necessary.
        b. The following information will be available to the individual evaluating the audiogram:
            i. A copy of the Hearing Conservation Standard.

ii. Baseline and most recent audiogram reports.
iii. Records of background sound pressure levels in the audiometric test rooms (as received from the test provider).
iv. Records of audiometer calibrations required by WAC 296-62-09029 (5) (as received from the test provider).

c. The audiogram provider will inform each employee verbally at the time of testing, of his/her results and whether or not there has been a hearing level decrease or improvement since the previous test. The employee shall be notified in writing of any Standard Threshold Shift within 21 days of notification by the hearing Test Provider.
d. The audiometric test provider will provide an annual summary of the hearing test data to the Contractor.

5. Audiograms – Follow-up
   a. The Test Provider will carry out the following:
      i. Send a summary of audiometric tests to the Contractor after each testing period.
      ii. Send copies of letters describing test results for distribution to the employee and to required agencies such as Worker's Compensation. Letters will follow all baseline exams. Letters will follow annual exams only if an STS is detected or if a medical or audiologist referral is being made.
      iii. Substitute the annual audiogram for the baseline audiogram, when, in the judgment of the audiologist, Otolaryngologist or other qualified physician who is evaluating the audiogram:
         - The Standard Threshold Shift revealed by the annual audiogram is persistent
         - The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram
      iv. Fit, re-fit, and re-train personnel regarding hearing protection who have had an STS.

The Contractor shall:

a. Forward provider letters to personnel.
b. Shall review the report and take appropriate action.
c. Obtain a re-test within 30 days of notification, if an STS has occurred. (The results of the re-test will be considered the annual audiogram.)
d. Coordinate additional testing, either "diagnostic" (extensive hearing evaluation) or "medical" (less extensive check-up, e.g., for wax accumulation) if recommended by the provider.
e. See that confirmed STSs are reported on the OSHA 300 Log.

M. Recordkeeping
1. All records of noise exposure monitoring shall be retained by the Contractor for a minimum of 2 years.
2. All audiometric test records shall be retained for the duration of the affected personnel's employment. Audiometric test records will contain the following information:
    a. Audiograms with name, job classification, date, examiner's name, date of the last acoustic or exhaustive calibration of the audiometer.
    b. Audiometric test room measurements.

N. Education and Training
1. All personnel within the program must complete an annual education and training program in conjunction with their hearing testing.
2. The program shall be updated annually to incorporate changes in hearing protection technology and work processes.
3. Employee education for the Hearing Conservation Program will address the following elements:
    a. The effects of noise on hearing.
    b. The purpose of hearing protection, the advantages, disadvantages, and attenuation of various types, instruction on selection, fitting, use, and care.
    c. The purpose of hearing testing and explanation of test procedures.
    d. Information regarding the right to access audiometric test records.
    e. A demonstration on the proper insertion/use of hearing protection devices.
    f. Information regarding the personnel's right to access his/her records.

Appendix A

Hazard Avoidance Notification Form

Date:_____

To: _____
(Employee)

From: _____ _____
(Supervisor) (Contractor)

Subject: **NOISE AVOIDANCE NOTIFICATION**
Prior to Baseline and End-of-Exposure Hearing Tests

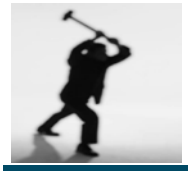
In order to obtain an accurate measurement of hearing thresholds, Washington State Hearing Conservation regulations (WAC 296-62-09015) require that a baseline or End-of-Exposure audiogram be preceded by at least fourteen (14) hours of quiet time (no loud noise exposure such as loud music, driving in traffic with windows open, operating a power tools, etc.). Please wear hearing protection if necessary to meet this requirement.

Your exam is scheduled for:

Date:_____

Time: _____

Place: _____



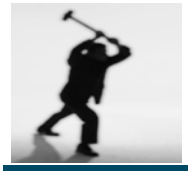
Demolition

A. Scope
This section defines minimum safety requirements for Contractor personnel performing any alteration, demolition, dismantling or renovation of existing structures.

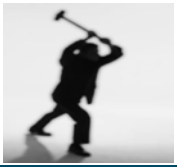
B. Purpose
To prevent injury to employees or members of the public and eliminate property damage during such operations.

C. Reference
29 CFR Subpart T; WAC 296-155-775 Part S; ANSI/ASSE A10.6-1990 and Master Specifications/Division 2 - Site Work/02 41 13 – Site Demolition

D. General
1. Prior to permitting employees to start demolition operations, an engineering survey shall be performed, by a Qualified Person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where workers may be exposed shall also be similarly checked. An Industrial Hygiene or other survey identifying regulated material or other hazardous materials such as gases, explosives, flammable materials or similarly dangerous substances shall be obtained and those materials abated prior to demolition activities begin. The employer shall have, in writing, evidence that such a survey has been performed.
2. The Contractor shall utilize, as a minimum, the National Association of Demolition Contractors Engineering Survey.
3. In addition, the Contractor shall submit for acceptance, a demolition plan and Job Hazard Analysis to the Engineer that as a minimum addresses the following:
    a. Worker Safety.
    b. Protection of the public in areas surrounding the demolition site.
    c. Emergency procedures and fire protection.
    d. Work sequence.
    e. Protection of the environment.
    f. Means and methods to minimize waste and maximize salvage.
    g. Disposal procedures.
    h. Fall protection methods.
    i. Hazardous Materials procedures, including Contractor Health and Safety Plan (CHASP) for handling contaminated / hazardous material.
    j. Employee protection while operating heavy equipment and / or mobile equipment.
4. A copy of the survey report and of the plans and/or methods of operation shall be maintained at the job site for the duration of the demolition operation.
5. Federal and state codes, safety standards, rules, regulations and ordinances governing any and all phases of demolition work shall be afforded the employee.



6. Before any demolition begins all utilities such as electric, gas, water, steam, sewer, and other service lines shall be de-energized, shut off, capped, or otherwise controlled.
7. A survey shall be performed to determine whether asbestos, hazardous materials, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. A copy of the survey shall be kept on the project.
8. Demolition of all buildings and structures shall be conducted under the supervision of a Competent Person. The Competent Person shall conduct field inspections as the work progresses, to ensure that the demolition plan is being implemented and adhered to by the Contractor and to detect hazards that may have developed during the course of the demolition process. A daily inspection shall be documented and any deficiencies corrected immediately.
9. Prior to concrete cutting operations where energized utilities may be present, the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electrical power circuit, exposed or concealed, is so located that the performance of the work may bring a person, tool, or machine into physical or electrical contact with the electrical power circuit and marked.
10. The Contractors shall implement and follow their submitted dust control plan throughout the demolition process as required.
11. All floor and wall opening created during the course of demolition shall be guarded and posted according requirements set forth in this program.
12. All protruding nails or other sharp objects shall be pulled, bent over, or rendered harmless.
13. No demolition debris shall be dumped from heights greater than 10 feet without the use of enclosed debris chutes. Use of barricades, delineation or spotters shall be used whenever debris is being dumped from any height. Delineation or barricades shall be placed at a distance far enough to prevent exposure from falling debris.
14. All stairways, passageway, and ladders being used for access and egress shall be positively identified. All others shall be barricaded and closed entirely.
15. Housekeeping shall be maintained at all times. Walkways and passages shall be kept clear and defined.
16. The Contractor shall follow the Personal Protective Equipment requirements found in this Manual.
17. The Contractor shall have a Fire Protection/Hot Work policy in place.
18. Additional fire protection requirements may be required when direct area suppression systems have been deactivated.
19. The following is a National Association of Demolition Contractors Engineering Survey.



Demolition Engineering Survey

Type of Structure _____

Location _____ Basement _____

Stories or Height _____ Size of Structure _____

Locate Party Walls _____

Are wall ties required? _____ How many? _____ What type? _____

Structural Hazard _____

Is shoring of walls or floors required? _____

Type of shoring and location(s) _____

Protection for adjacent properties _____

Existing damage in adjacent structures (include photos) _____

Protection for the public _____

Methods of demolition _____

Utilities and their locations (power lines, telephone, cable lines, etc.) _____

Location of tanks _____

Previous use of tanks _____

Have tanks been purged & tested? _____ By whom/date? _____

Safety Data Sheets provided by Owner (attach all SDSs) _____

PCBs _____

Asbestos (attach survey) _____

Lead (attach survey) _____

Location of pits or open holes (attach map if necessary) _____

Special hazards and remedies _____

Comments _____

_____ _____

Signature Date

Public Hazard Control

A. Scope
This section defines minimum requirements for the protection of the general public subject to hazards arising from operations connected with the construction, maintenance and repair, and 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 the Port facilities.

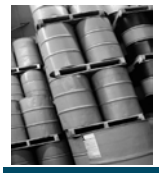
C. Reference
Port of Seattle Project Manual Division 1, 01 50 00 – Temporary Facilities and Controls, Uniform Manual of Traffic Control Devices, & ANSI A10.34-2001.

D. General Requirements
1. Port properties are operating facilities that must remain in full operation throughout the term of this contract. The Contractor shall conduct all operations with the least possible obstruction and inconvenience to the Port, its tenants and the public.
2. The Contractor shall develop a Public Hazard Control Plan for the project.
3. The Plan shall ensure the safety of passengers, tenants, employees, suppliers or vendors traveling on Port property, 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 shall be addressed.
4. The plan shall communicate to all employees, including subcontractor employees at any tier, their responsibilities under the plan.
5. The Contractor shall appoint one employee as the Contractor's point of contact. The appointed representative shall have the authority to act on behalf of the Contractor and shall be available, on call, twenty-four hours a day, throughout the duration of the contract. A twenty-four hour telephone number shall be provided to the Engineer for use in case of an off-hour emergency. The Contractor shall provide immediate response to correct all deficiencies upon notification.
6. The Contractor shall be responsible for the placement and maintenance of all devices and signage required for the protection of the public.
7. The Contractor shall perform daily inspections of the work to ensure their plan is fully implemented and operational. All inspections shall be documented.
8. All necessary measures shall 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.
9. Barricades shall be provided to delineate the work area from areas used by the public. The barricades shall be suitable for the hazard and location and shall be constructed in accordance with the requirements found in Division 1 –01 50 00 – Temporary Facilities and Controls.

10. The Contractor shall construct 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.
11. The Contractor shall perform daily inspections of the work to ensure their plan is fully implemented and operational. All inspections shall be documented.
12. In the event an accident occurs involving the public, the Contractor shall notify the Engineer and Program Safety Director immediately. The Contractor shall conduct an investigation and submit a written report within 24-hours to the Engineer and Program Safety Director.
13. The plan shall also include the names and phone numbers of fire, police, ambulance, and Port personnel.
14. Any statements to the news media shall be made through the Port of Seattle's Public Affairs Department.

E. Hazards to Consider
   1. Traffic Hazards
      a. The Contractor shall prepare a traffic control plan. The plan shall be in accordance with 01 55 26 – Traffic Control as found in the Port of Seattle Project Manual / Division 1.
      b. The Contractor shall provide and maintain controls as required to warn and protect the public, tenants, and Port employees from injury or damage caused by the Contractor's operations. No work shall 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 found in Division 1 / 01 50 00 – Temporary Facilities and Controls/ Part 1.08.
      d. Where pedestrian access is impacted, suitable safe access shall be provided. The pathway shall be clearly marked with lighting provided.
      e. Ensure that hazards that may cause slipping, tripping, or falling are eliminated or minimized.
      f. Non-level surfaces shall be delineated with high visibility markings and/or signage.
      g. Stairs, ramps, and elevated walkways shall be provided with standard guardrails. Those exposed to weather shall be constructed with non-slip surfaces.
      h. All welding, cutting or grinding operations shall be provided with shields. Welding fumes shall 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 shall be restricted by the Contractor by the use of barricades, fencing, warning signs, or personnel.
    b. When equipment or other vehicles must enter or exit the construction site, the Contractor shall warn the public by use of electric reader boards, flaggers and traffic control devices.
    c. The Contractor shall provide and maintain crushed rock roadway traffic zones at staging areas and site access locations to ensure entrance, staging areas and surrounding roads are free from mud.
    d. Contractor's equipment that is operated on public roadway traffic areas shall be equipped with "slow moving vehicle" placards and overhead warning lighting.
    e. The Contractor shall not hoist any loads over any active public roadway, sidewalks, or areas utilized by the public.
    f. All construction vehicles and equipment on the 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 windblown 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, the Contractor shall install barriers, catch platforms, enclosures, debris netting, or implement other administrative or engineering controls.
    b. Controls that are implemented shall be of sufficient strength to prevent public impact.
6. Security
    a. Provide security and facilities to protect the work and the Port's operations from unauthorized entry, vandalism, and theft.
    b. The construction area shall be closed to the public at all times.
    c. For outdoor areas, a 6-foot chain link fence with gates shall be provided around the perimeter of the site during the entire length of construction unless approved otherwise by the Port.
    d. The 24-hour contact number(s) of the person(s) responsible for security of the work area shall be furnished.



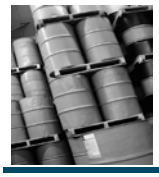
Material Handling & Storage

A. Scope
This section defines the minimum requirements for material handling and storage on all Port of Seattle construction projects.

B. Purpose
To reduce or eliminate the potential of injury to Contractor employees and visitors performing work on Port of Seattle construction projects.

C. Reference:
WAC 296-155 Part F [Storage, use, and disposal] and Part F-1 [Rigging requirements for material handling].

D. General material storage safety
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.
4. Do not store materials on scaffolds or runways in excess of supplies needed for immediate operations.
5. 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.
6. Do not place materials stored inside buildings under construction within 6 feet of any hoistway or inside floor openings, or within 10 feet of an exterior wall that does not extend above the top of the material stored.
7. Segregate non-compatible materials in storage.
8. Stack bagged materials by stepping back the layers and cross-keying the bags at least every ten bags high
9. Do not stack bricks more than 7 feet high. When a loose brick stack reaches a height of 4 feet, 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.
10. 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.
11. 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.
12. 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 shall comply with WAC 296-155 Part F-1 [Rigging requirements for material handling]:
   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.

Pile Installation & Extraction

A. Scope
This section defines the minimum requirements for the installation and removal of piles during construction and demolition operations

B. Purpose
The prevention of injuries and illnesses to persons exposed to hazards associated with pile driving and extraction operations.

C. Reference
ANSI STD A10.19, 2.19 Trenching and Excavation of this Manual, Fall Protection section of this Manual

D. Definitions:
Anvil. The bottom portion of a pile hammer that receives the impact of the ram and transmits energy to a pile.

Batter Pile. A pile driven at an inclination to the vertical to provide resistance to horizontal forces.

Bounce. The hoisting of a load, momentarily releasing the brake, catching the load with the hoist line and braking again.

Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.

Cushion Block. A pad, most commonly comprised of plywood, placed on top of a pre-cast concrete pile to eliminate spalling.

Cushion Pad. A pad of resilient material or hardwood placed between a helmet and drive cap adapter.

Deflector Sheave. Sheave(s) used to change the direction of travel of a crane hoist line.

Drive Cap Adapter. A steel unit designed to connect a specific type of pile to a specific pile hammer, most commonly connected to the pile hammer by steel cables.

Drive Cap Insert. A steel unit that is shaped to fit over the top of various types and shapes of piling, and which positions the pile under the drive hammer and connects it to the drive cap adapter.

Drive Cap System. The assembly of components used to connect and transfer energy from a pile hammer to a pile.

Drive Head. A steel accessory placed over a pile to prevent damage from driving. A driving head is suspended beneath a pile hammer by cables; it contains a well or recess on its top for cushion material and for seating an anvil (if used). Its bottom is formed to accept a specific shape of pile, along with its cushion (if used). Its outside incorporates a lug or insert slot for attachment to the lead system. A driving head is also referred to as an anvil block, bonnet, cap helmet, follow cap, rider cap, or shield.

Fall. A measure of a rigging component's vertical length.

Follower. An extension used between a pile and pile hammer that transmits blows to the pile when the pile head is either below the reach of the pile hammer (below the guides/leads) or under water. A follower is commonly a section of pipe or "H" pile with connections that match both the pile hammer and the pile being driven.

Ground Conditions. The condition of the ground as it relates to its adequacy for support of pile driving equipment and stored materials, including the ground's slope, compaction, and firmness.

Ground Release Shackle**.** A specially designed shackle with a rope attached to a release mechanism actuated from ground level.

Guide Rails. That part of the pile hammer leads which forms a pathway for the pile hammer and which consists of parallel members that mate with the side channels of the pile hammer. Guide rails are also referred to as "Lead Rails" or "Hammer Guides".

Hammer, Drop Impact. A pile hammer (also referred to as "Drop" Hammer or "Hair Pin" Hammer). For purposes of this section, there are four types:

1. Cable Operated Drop Hammer. A drop impact (pile) hammer consisting of a machine lifted weight that is allowed to free fall to drive the pile.
2. Steam Drop Hammer. A drop impact hammer consisting of a cylinder that acts as the falling weight that is lifted by steam pressure.
3. Hydraulic Drop Hammer. A drop impact hammer consisting of a segmented ram, which is lifted by hydraulic pressure to a pre-set height. The pile hammer is then allowed to fall onto a driving cap. The weight and height of the ram can be varied to suit site conditions.

4. Diesel Drop Hammer. A drop impact hammer consisting of a cylinder, which acts as the falling weight, which is operated by compression-ignition as a result of the weight falling and compressing the contents of the cylinder.

Hammer Energy. The amount of potential energy available to transfer from a pile hammer to a pile, usually measured in foot-pounds.

Kicker. The strut between the crane and the pile leads. (Also referred to as a "Spotter".)

Leads. Two parallel members of a wooden or steel frame for guiding the pile hammer and piles in correct alignment. There are three types of leads:

1. *Fixed Leads.* Leads that are fixed to a pile rig at its top and bottom.
2. *Swinging Leads*. Leads that are supported at the top by a cable attached to a pile rig.
3. *Semi-Fixed or Telescopic Leads.* Leads that are allowed to translate vertical in relation to a pile rig's boom tip.

Lifting Bail. Rigging apparatus used to attach a crane hoist line to the pile driving equipment.

Mandrel**.** A full-length steel core set inside a thin shell casing for cast-in-place concrete piles. A mandrel assists in maintaining pile alignment and prevents the shell from collapsing. It is removed after driving is complete.

Moonbeam**.** A device attached to the end of a lead brace, which will allow a pile to be driven with a side batter pile.

Penetration**.** The amount of downward movement of a pile measured in blows.

Pile. A concrete, steel, or wood column, which is driven or otherwise introduced into the soil, usually to carry a vertical load or to provide lateral support.

Pile Butt. A term commonly used in connection with timber piles. The upper or larger end of a pile closest to the pile hammer.

Pile Contractor**.** A contractor whose scope of work on a particular project includes the installation and/or extraction of piles.

Pile Gate. A hinged section attached to the pile leads, at the lower end, which serves to keep the pile within the framework of the pile leads.

Pile Hammer. A device, which develops and expends the energy used to drive piles, the two main parts of which are the ram and the anvil. Also referred to as a "Pile Driver Hammer".

Pile head. The upper end of a pile.

Pile Rig. The crane or other type of equipment used to support the leads and pile driving assembly during a pile driving or extraction operation.

Power Plant. A prime mover consisting of an engine and generator, hydraulic pump or compressor used to provide electricity, hydraulic power, or compressed air to portable construction equipment such as a vibratory pile hammer/extractor or impact pile hammer/extractor.

Project Constructor**.** A person, firm or corporation i.e. the construction manager, general contractor, prime contractor or other entity, as designated in the project documents, responsible for supervising and controlling all construction work performed on the project.

Ram**.** The moving part of a pile hammer, consisting of a piston and a driving head, or driving head only.

Rated Speed. The number of blows per minute of a pile hammer when operating at its maximum rated efficiency.

Sheave. An assembly consisting of a pulley wheel, side plates, shaft, and bearings over which a cable or rope is passed. For purposes of this section, there are two types of sheaves:

1. *Deflector Sheave.* A sheave use to change the direction of travel of a crane's hoist line.
2. *Turn-Around Sheave*. A fixed sheave mounted to a pile hammer for increasing the mechanical advantage of a crane hoisting capacity.

Sheeting Shackle**.** A specialized rigging assembly used to hoist and set sheet piles.

Spotter. The strut between the crane and the pile leads (also see "Kicker").

Spudding. The driving of a short and stout section of pile-like material into the ground to penetrate or break up a hard ground strata and permit pile driving, common in the driving of timber piles.

Stroke. The length of a fall of a ram.

Supporting Material. Blocking, mats, cribbing, marsh buggies or similar supporting materials or devices.

Template. A fabricated guide of almost any shape, sued to align piling before driving.

Tip. The first part of a pile to penetrate the ground, (also referred to as a "Pile Tip").

Trip Latch. A block in the leads of a drop impact hammer that causes the release of the pile hammer's weight at a predetermined height or a mechanical device used with a diesel hammer to pick up and release the piston to start the pile hammer. Also referred to as a "Trip Block" or "Tripping Device".

E. General.
   1. Planning and Site Conditions
      a. A Site Specific Safety Plan (SSSP) and Job Hazard Analysis (JHA) that identifies the specific sequence, hazards associated with each step, and procedures to minimize or eliminate the hazard potential. Public Hazards Controls shall be identified in areas that intrude with the contractors operations.
      b. A geotechnical report should be developed to identify subsurface conditions and provide geotechnical conclusions and recommendations for design and construction.
      c. For landside pile driving/extraction operations, the ground conditions for equipment operations are firm, graded and degree on level are met according to manufacturer's recommendations.
      d. A control access zone shall be established, delineated around the installation, driving, hoisting and/or extraction to prevent access by persons not directly involved in the operation. The zone shall be maintained under the supervision of a Competent Person.
   2. Delivery and Storage of Piles
      a. Piles or sheet piling shall be adequately supported by blocking
      b. Pipe piles shall be stacked in well supported and braced racks or frames or other effective dunnage
      c. Pre-cast concrete piles shall be handled in a manner that prevents damage to the pile.
         i. Care shall be taken to place bearers only at lifting positions
         ii. Piles shall only be lifted at those points indicated on the plans.
         iii. Piles shall not be driven until they have attained sufficient compressive strength.

   3. Material Handling
      a. Only rigging of adequate size, configuration, and capacity shall be used to handle piles.

   b. Piles shall not be hoisted with open hooks or open sheeting shackles. Piles shall not be sorted with open hooks or sheeting shackles unless they are designed for that purpose.
   c. Piles shall not crossover any portion of boarding ramps during any portion of the pile driving process.

4. Power Equipment
   a. Air Quality monitoring should be performed to ensure a safe working environment. Continuous air quality monitoring shall be performed if atmospheric hazards are suspected or present.
   b. Fuel-operated power plants shall not be operated in an enclosed area unless exhaust is adequately ventilated or ducted away from the work areas.
   c. Boilers, air compressors, and hydraulic power units shall be inspected, maintained, and operated in accordance with their manufacturers' requirements.
5. Specific Pile Driving Requirements
   a. All employees involved in pile installation, extraction, and related operations shall wear head, eye, hearing, hand and foot protection.
   b. The manufacturer's recommendations for the assembly and disassembly, inspection, maintenance, and operation of the installation equipment and piling elements installation shall be followed.
   c. A blocking device capable of safely supporting the weight of the pile hammer shall be utilized for placement in the leads under the pile hammer and used at all times while employees are working under the pile hammer.
   d. Where the boom, counterweight, or other structural part of a crane has been modified to accept equipment related to pile driving (e.g. leads, pile hammers, power supply), the user shall demonstrate that the modification(s) have been certified and will not affect the safe operations of the crane.
   e. No person shall stand under the kicker or directly under, in front of, or within at least 12 feet of the pile hammer or pile when a pile is being driven.
   f. During pile hoisting, tag lines or similar devices shall be used where necessary to control rotation of the load. Safety lugs shall be welded to steel pipe piles to prevent the pile line from slipping off the pile during hoisting. Whenever possible the top of the pile shall be guided under the pile hammer from the ground to eliminate the need for climbing the leads to set the pile.
   g. If an employee is required to climb the leads, the operator of the equipment will apply all brakes and necessary safety switches to ensure no uncontrolled motion of the equipment.
   h. The driving hammer shall be inspected at least once every shift. If hard driving is encountered, more frequent inspection is required. All bolts, cable clamps, cables, cushion blocks, fuel lines, rail bolts,

cocking and trip mechanisms, fuel pumps, injectors, and drive head retaining pins shall be inspected on the same schedule.

i. Shackles shall be secured against unintended opening by steel wire of equivalent. Field-made lifting devices are prohibited. Shop-made lifting devices shall be designed and certified by a registered professional engineer that complies with ANSI/ASME B30.10.
j. All driving operations shall be momentarily suspended if the load line from a pile being driven is or becomes detached.
k. Stop blocks shall be provided for the leads to prevent the pile hammer from being raised against the head block.
l. All employees shall be kept clear when piling is being hoisted in the leads.
m. When driving or jacking piles in pits or pile caps four (4) feet or more in depth, the excavation shall be evaluated by a competent person for cave-in and atmospheric hazards according to this Manual.
n. Hoisting and driving of piling shall be performed in a manner that positively prevents accidental detachment of the pile from the hoisting equipment's lifting hook. A shackle may be used in lieu of a hook.
o. Taglines should be used for controlling unguided piles and free hanging pile hammers.
p. Where a drop impact hammer is used for driving piles other than sheet piling, a driving head or bonnet shall be provided to bell the bead of the pile and hold it true in the leads.
q. Pile hammers shall be lowered to the bottom of the leads while the pile driver is being moved.
r. When driving with a crane-suspended vibratory pile hammer, the person operating the remote on/off clamp switch shall be in direct visual contact with the signal person
s. Power units shall be operated at full recommended operating speed during the driving cycle.
t. A vibratory pile hammer shall not be unclamped from a pile when there is any line pull on the suspension or when the pile hammer is still vibrating.
u. Cable stays used for aligning sheet pile(s) during driving operations shall be removed from the sheet pile(s) that are being driven.
v. When the leads must be inclined in the driving batter piles, provisions shall be made to stabilize the leads.
w. Guy wires, outriggers, thrust-outs or counter-balances shall be provided as necessary to maintain stability of pile driver rigs.
x. Pile hammers, when stored, shall be secured against accidental displacement.

NOTE: Laminated cushion blocks have a tendency to catch fire after an extended driving session. Caution is needed when handling to avoid severe burns or equipment damage

6. Specific Pile Hammer Requirements
    a. Vibratory.
        i. The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment, such as the couplings, support and lifting equipment, rigging, and retaining bolts shall be inspected before each shift and periodically during use.
        ii. The power unit's engine and hydraulics shall reach recommended operating temperatures before the hammer is operated.
        iii. Rigging attached to the lifting pin of the pile hammer shall be capable of supporting the weight of the pile hammer and piling to be driven or extracted. These weights shall not exceed the manufacturer's specifications.
        iv. The pile shall be firmly gripped by the exciter jaws when clamping. The correct clamp shall be used for the shape of the member being driven or extracted.
        v. The exciter (vibratory pile hammer) shall not be unclamped from the pile when there is any line pull on the suspension or when the pile hammer is still vibrating.
    b. Steam.
        i. The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment, such as the boiler, support and lifting equipment, rigging, couplings and retaining bolts shall be inspected before each shift and periodically during use.
        ii. All steam supply piping and hoses shall be properly sized to prevent undue flow restrictions.
        iii. Only driving heads of the correct size and shape for the pile to be driven shall be used.
        iv. Driving heads shall be kept aligned with the pile and pile hammer as a pile is driven.
        v. Employees shall remain clear of the exhaust, valve mechanism and slide bar, columns, supporting rig, ram, pile cap, and ram point when the pile hammer is in operation.
    c. Hydraulic
        i. The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment, such as the boiler, support and lifting equipment, rigging, couplings and retaining bolts shall be inspected before each shift and periodically during use.

ii. All hydraulic supply piping and hoses shall be properly sized to prevent undue flow restrictions.
iii. Only driving heads of the correct size and shape for the pile to be driven shall be used.
iv. Driving heads shall be kept aligned with the pile and pile hammer as a pile is driven.
v. Employees shall remain clear of the exhaust, valve mechanism and slide bar, columns, supporting rig, ram, pile cap, and ram point when the pile hammer is in operation.

d. Pneumatic.
   i. The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment, such as the boiler, support and lifting equipment, rigging, couplings and retaining bolts shall be inspected before each shift and periodically during use.
   ii. All pneumatic supply piping and hoses shall be properly sized to prevent undue flow restrictions.
   iii. Only driving heads of the correct size and shape for the pile to be driven shall be used.
   iv. Driving heads shall be kept aligned with the pile and pile hammer as a pile is driven.
   v. Employees shall remain clear of the exhaust, valve mechanism and slide bar, columns, supporting rig, ram, pile cap, and ram point when the pile hammer is in operation.

e. Diesel.
   i. The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment, such as the boiler, support and lifting equipment, rigging, couplings and retaining bolts shall be inspected before each shift and periodically during use.
   ii. The pile hammer and leads shall be of a compatible size, shape and capacity.
   iii. The pile driving crewmembers shall be familiar with how the specific diesel-powered pile hammer is started and stopped during normal and emergency conditions.
   iv. Cold starting of a diesel pile hammer shall be in accordance with the manufacturer's recommendations. Extreme caution shall be observed in preventing flammable material explosion(s) and forceful ejection(s) of exhaust.
   v. Diesel-powered pile hammers shall not be lubricated, serviced or repaired while in operation.
   vi. All crew members shall be trained in and demonstrate familiarity with:

- The safe operation of the hammer's diesel trip mechanism; and,
- The fire, explosion and exhaust-related hazards associated with cold starts.

7. Pile Leads
    a. Leads shall be assembled in accordance with their manufacturer's specifications using only the approved fasteners and required torque values. Bent or otherwise deformed or damaged lead sections shall not be used. All repairs to leads and lead components shall be made in accordance with their manufacture's specifications.
    b. Shop made piling leads and attachment connections shall be designed and certified in writing by a registered Professional Engineer who has demonstrated familiarity with such equipment.
    c. Stop blocks shall be provided for the leads to prevent the pile hammer from being raised against the head block.
    d. A blocking device, capable of safely supporting the weight of the pile, hammer, shall be provided for placement in the leads under the pile hammer whenever an employee is working under the pile hammer.
    e. Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.
    f. When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads. Pile gates shall be of a size sufficient to secure piling at the bottom of the leads during driving operations. At no time is an employee to open the gates while a pile hammer is driving a pile.
8. Access To Pile Leads
    a. Pile leads shall be provided with a ladder or horizontal bracing that is uniformly spaced at intervals no greater than 18" and which prevent employees from contacting the pile hammer. Such assemblies shall be equipped with adequate anchorages for personal fall protection equipment. If the leads are provided with loft platform(s), all open sides shall be protected by standard guardrails as defined in this Manual, except between the platform and the pile hammer leads.
    b. Unless there is no other feasible means to perform the task, no employee shall remain aloft in or on the leads during the driving or extraction of piles. A Job Hazard Analysis will be developed to identify suitable alternate safe practices.
    c. Prompt, safe, emergency rescue procedures will be identified in the Contractor's Fall Protection Work Plan as discussed in this Manual.
9. Sheet Pile Access
    a. Employees shall not ride the pile hammer, crane load blocks or overhaul ball to take position on sheet piling. Employees shall use ladders, aerial lifts, or suspended work platforms (according to guidelines established in this Manual) for elevated access.

b. Stirrups shall be provided for use by employees who must take a position on sheet piles. When used, the sheet piling shall be secured from movement so it does not run when the next sheet is threaded in to lock. A suitable anchorage for personal fall protection shall be provided and identified in the Fall Protection Work Plan.

10. Pile Templates
    a. Walkways on templates shall be kept clear of tripping hazards.
    b. Each employee on a walking/working surface (horizontal and vertical) with an unprotected side or edge four (4') feet or more above any part of a temporary or permanent structure, template, or cofferdam shall be protected from falling to lower levels by standard guardrails, nets, or personal fall protection equipment in accordance with this Manual.
    c. A ladder or equivalent safe access shall be provided to templates when a break in elevation of 18" or greater exists at personnel points of access.
11. Hoisting of Personnel
    a. When an employer can demonstrate that there is no less hazardous alternative means of access to the piling rig, refer to the Suspended Work Platform section for POS acceptance procedures
12. Working Over or Near Water
    a. In every crew there shall be a designated signal person, and the deck engine, winch, or crane operator shall receive signals from no other person.
       Exception: When an employee is aloft, the pile hammer shall not be moved except on the signal of the employee aloft.
    b. All deck engines, not operated by an operator on the throttle side, shall be equipped with a cross extension of the throttle that is within the reach of the spool tender.
    c. Every hoisting drum used on a pile driver that uses a dog and ratchet assembly to hold it in position, shall be equipped with an adequate dog. This dog shall be readily visible from the engine operator's station or shall be provided with a directly connected and positive telltale device that will be visible.
    d. Counterweights or springs on the dog, which would allow the dog to be automatically disengaged by relieving the load or rotating the drum, shall not be permitted.
    e. Land based cranes or derricks working from floating barges or pontoons, shall operate at less than their rated capacities on land. The manufacturer's recommended load rating and allowable list and trim for such cranes working from water shall not be exceeded. All deck surfaces or the crane pontoon or barge shall be above the water and the entire bottom of the pontoon or barge shall be submerged.
    f. Each employee on a walking/working surface (horizontal and vertical) with an unprotected side or edge four (4') feet or more above any part of a temporary or permanent structure, template, or cofferdam shall be

protected from falling to lower levels by standard guardrails, nets, or personal fall protection equipment in accordance with this Manual.

g. Careful consideration of derrick deck hazards shall be addressed in a Job Hazard Analysis. Subjects should include but not be limited to: spud cable hazards, crane turntable swing radius hazard, etc…

13. Pile Extraction
    a. At no time shall the operator of the crane cause the load to bounce.
    b. When piles are extracted with a vibratory pile hammer suspended from a crane:
        i. The crane shall have a lifting capacity of at least five (5) times the weight of the pile hammer and pile.
        ii. The rated capacity of the vibratory pile hammer's suspension shall not be exceeded. The manufacturer's recommendations for extracting piling shall be observed at all times.
    c. When piles are extracted by drop impact:
        i. The connection between the pile hammer and the piling shall be sound and inspected often during the extraction process.
        ii. The rated capacity of the drop impact hammer's suspension shall not be exceeded. The manufacturer's recommendations for extracting piling shall be observed at all times.
        iii. The crane shall have a lifting capacity of at least five times the weight of the pile hammer and pile.

Confined Space Entry

A. Scope
This section outlines the minimum safety requirements to be followed while conducting work in a confined space.

NOTE: The POS Construction Confined Space Entry Program is more stringent than the WISHA or OSHA requirements. The Contractor's program must meet or exceed these requirements.

B. Purpose
The intent of this program is to reduce the potential for injury to personnel, fire, explosion and damage to property while engaged in confined space entry work.

C. Reference
WAC 296-809 and ANSI Z117.1-2003

D. Definition
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, the work, or project.

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

Confined Space is a space that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work;
2. Has limited or restricted means for entry or exit;
3. Is not designed for continuous occupancy.

Some typical examples of confined spaces found on this project are electrical vaults, excavations & trenches (where potential or known hazards exist), utility manholes, sewers, elevator shafts/pits. The Contractor's Qualified Person will be required to make a determination as to what is and what is not a confined space.

NOTE: There are no minimum depth requirements for confined spaces.

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.

Permit Required Confined Space is a space that:

1. Meets the criteria for a confined space listed above.
2. 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 overlook the obvious – animals, insects or reptiles can create hazards during a confined space entry.

Confined Space Survey is a survey that is initially conducted by the Contractor's Qualified Person of the project or operations to identify confined spaces a defined by the standard.

E. Requirements

1. Contractors entering into confined spaces on the Port Projects must first complete the Contractor Confined Space Entry Program Certificate found in Appendix B of 01 35 29 -Safety Management and forward to the Engineer. This form must also be completed for each subcontractor with personnel that enter confined spaces.
2. A Job Hazard Analysis (JHA) must also be completed for this operation.
3. 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 shall be tested before employees enter excavations 4 feet or greater than in depth.
4. Prior to excavating activities, Contractor shall submit for acceptance a Contractor Health and Safety Plan (CHASP) for handling contaminated soils outlined within 01 35 29 1.08.B.1.k.

NOTE: Port of Seattle Environmental may have important information on site conditions and potential soil contaminates that can be used to assist in preparation of the CHASP.

F. Training

1. Training in confined space entry and rescue procedures shall be the responsibility of the Contractor/Employer involved in the work. Training shall be given to all personnel who will or may perform such work prior to initial assignment in confined space and at least annually thereafter. As a minimum, training shall cover the following procedures and related personnel:
    a. Hazard recognition.
    b. Emergency procedures.
    c. Use of personal protective equipment.
    d. Electrical/mechanical lockout and tagout procedures.
    e. Proper use and limitations of atmospheric testing devices.
    f. Proper use of special equipment and tools.

g. Refresher training of personnel shall occur when employees are noted to be in violation of the standard 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 Contractor personnel or Contractor designated personnel who provide rescue and emergency services.
5. Documentation - The names, dates, and type of training performed shall be documented and maintained in the Contractor's file. This shall also include any subcontractor employees involved. The Contractor's records must be available to the Construction Safety Staff and Engineer to verify that the employees are trained.

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.
4. Employees exposed to physical hazards shall utilize appropriate Personal Protective Equipment (PPE) for the work to be performed.
5. 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.
6. 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 cannot 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	Toxicity Threshold Limit Value (TLV) PPM
Carbon Monoxide (CO)	Colorless Odorless	12.5%	35 PPM
Carbon Dioxide (CO_2)	Colorless Odorless	Nonflammable	5000 PPM
Methane (CH_4)	Colorless	5%	500 PPM
Hydrogen Sulfide (H_2S)	Colorless Suffocating Odor	Nonflammable	2 PPM
Nitrogen Dioxide (NO_2)	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.

3. Airport Projects: Entry into vaults containing energized systems requires notification 7 days in advance to the STIA Electrical Shop. Work on systems that are not de-energized requires proper PPE as found in WAC 296-45 Safety Standards for Electrical Workers and this Manual.

K. Clean and Purge the 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 scale buildup on the inside walls, the configuration of the space, and the size and location of manholes, hatches, and 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 vessel and drain or pump out remaining sludge and residue.
    b. Flush the vessel if possible. Flushing can range from simply hosing the walls and floor to completely filling and draining the container.
    c. It may be necessary to purge the vessel further with steam, nitrogen, or an inert gas after it has been flushed. The environment inside the vessel should be tested at this point to determine if further purging is necessary. If sediment adheres to the walls or floor, or if corrosion scale or rust is heavy, purging is almost always necessary.

L. Ventilate the 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: It is the responsibility of the Contractor’s Qualified Person to determine the dimensions of the confined space and the number of air changes required in that space before the space is entered.

2. Ventilation is required to eliminate oxygen deficiency, accumulated combustibles or toxic substances. 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. When combustibles are purged, any spark source outside the space such as an electric or combustion motor 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

1. After the 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, the Engineer and POS Safety are to be notified.

NOTE: Contractor shall provide copies of confined space entry permits to the Engineer and to Construction Safety for any positive atmosphere tests.

3. When testing the atmosphere within the space from the outside is not possible, Self-Contained Breathing Apparatus, Supplied Air or other means shall 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 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 shall be dictated as to whether an explosive atmosphere exists in areas of intended use.

O. Entry Permit

1. All work performed in confined spaces shall be completed under a Confined Space Entry Permit System. It is the Contractor's responsibility to complete and monitor the 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.

3a. Airport Projects: The Contractor shall use the Confined Space Entry Permit found in this section.

3b. Seaport Projects: The Contractor shall use the Confined Space Entry Permit found in this section.

4. It is the responsibility of the 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.
5. The confined space entry permit shall be posted at the entrance into the confined space.

NOTE: Under WAC the Contractor must retain each cancelled confined space entry permit for at least one year.

P. Attendant

1. At least one 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 an attendant is not required but recommended. The attendant shall have no other duties.
2. The attendant shall remain at this station until the entry is terminated or another attendant relieves them of their duties.
3. Shall terminate the entry if a hazardous condition is detected.
4. Communication with the authorized entrants is a duty of the attendant.
5. The attendant must also monitor the activities of the entrants in the space and order an evacuation of the space if required.
6. The attendant shall summon rescue or emergency personnel to the space if required.
7. The attendant must also be properly trained, equipped, and capable of removing the worker in an emergency.

NOTE: Attendants are instructed not to *enter* the confined space to perform rescue unless another attendant is present and they have been thoroughly trained and equipped in confined space entry rescue. In this case, attendant shall be current in 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 shall not be entered. The Contractor shall notify the Engineer and the POS Safety Department.

2a. Airport Projects: If the space is deemed "permit required" the Contractor shall make arrangements prior to entry with the POS Fire Department by calling Fire Dispatch at (206) 787-4653. The Contractor shall inform Fire Dispatch of the location of the space to be entered the identified hazards, the time of entry and duration of entry.

NOTE: In the event of any emergency, the attendant shall call POS FD Emergency Rescue at (206) 787-5380. **DO NOT CALL** 911 as it may delay the emergency rescue response. The number for POS FD Rescue shall be written on the posted entry permit.

2b. Seaport Projects: Contractor shall make sure adequate rescue and emergency services are available during confined space entry operations. (Refer to item T of this section.)

3. Access and egress shall be maintained at all times while work is being performed in a confined space
4. All personnel entering confined spaces shall wear a full body harness. If the space is deemed "permit required" a lifeline shall be employed and attached from the harness to the retrieval system unless being attached would increase the overall risk of injury to the entrant or would not contribute to the rescue of the entrant. This shall be identified within the Job Hazard Analysis.
5. Before entry is made into any energized electrical cable vault or manhole, an infrared tester or equivalent shall 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 shall not be made. The Contractor shall contact the Engineer and the POS Electrical Shop.
6. Airport Projects: When work is completed the Contractor shall call Fire Dispatch at (206) 787-4653 and inform them that all entrants are out of the space and work has been completed and the permit cancelled.
7. The Contractor shall notify the Engineer and the Manager of Construction Safety Services of any problems created or identified during the course of the entry.

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 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 detected by the 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, both the Entry Permit and the Re-classification Permit must be completed. Monitoring of atmospheric conditions is required.
2. Employees entering the non-permitted confined space must be wearing a full body harness and a retrieval device must be readily accessible.

T. Rescue and Emergency Services
1. An employer whose employees have been designated to provide confined space rescue and emergency services must take the following measures:
    a. Provide and train employees with the required PPE.
    b. Train employees to perform their duties.
    c. Train employees in Basic First Aid and CPR.
    d. At least annually, train rescue personnel on removing victims through openings and portals of the same size, configuration, and accessibility as those spaces from which as actual rescue may take place.
2. An employer who designates rescue and emergency services must:
    a. Select a rescue team or service (prior to beginning work) that has the capability to reach the victims within the time frame that is appropriate for the confined space hazards identified.
    b. Is equipped for and proficient in performing the needed rescue services.
    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 permit spaces from which rescue may be necessary.

U. Illumination
1. Personnel shall 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 area 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.
5. Temporary illumination used in areas other than where flammable atmospheres are present shall meet all National Electrical Codes and local requirements, and be of the grounded type. Illumination is covered within this Manual.

V. Fire Protection

The following conditions shall be assured in confined spaces at all times. Refer to the Fire Prevention & Hot Work 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 the user prior to confined space work.
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 shall 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 shall be removed from the confined space. Fuel gas and oxygen hoses shall not be disconnected from the torch or other gas-consuming device while in the confined space.

Confined Space Entry

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.

AIRPORT

PORT OF SEATTLE "PERMIT REQUIRED" CONFINED SPACE ENTRY PERMIT

EMPLOYEES SHALL NOT ENTER A CONFINED SPACE UNDER ANY CONDITIONS UNTIL IT HAS BEEN PROPERLY EVALUATED!

1. Contractor: _____ 2. Date: _____ 3. Time: _____

4. Name & location of confined space:_____

5. Reason for entry: _____

6. Name of Entry Supervisor: _____

		YES	NO	N/A
7.	POS FD called prior to entry (206) 787-4653 and #1, 3, 4, C5&19 discussed?			
8.	JHA completed and discussed prior to entry? (attach to permit)			
9.	Fall protection is in place prior to opening the hatch/lid of space?			
10.	The atmosphere been monitored at various depths prior to entry?			
11.	The space is being ventilated?			
12.	All entrants are utilizing full body harnesses and retrieval system?			
13.	Communication between entrant(s) and attendant established?			
14.	All electrical equipment disconnected, locked & tagged out?			
15.	All mechanical and physical hazards are isolated, locked & tagged out?			
16.	Infrared scan of cables/connectors has been performed prior to entry?			
17.	Attendant is standing by the space during entry?			
18.	The completed permit is posted at the entrance to the space?			
19.	**How work required and hot work permit obtained from POS FD? (206) 787-5327**			
20.	**Emergency procedures and POS FD Emergency Rescue Phone # (206) 787-5380 have been discussed? Calling 911 may delay rescue!**			

21. List all employees who are trained and authorized to enter the space and those acting as attendant(s):

Authorized Entrant(s) _____
_____
_____

Designated Attendant(s) _____
_____
_____

22. Record of atmospheric testing:

Contaminant Tested For: - Limits	**Results**	**Time**	**Results**	**Time**	**Results**	**Time**
Oxygen (19.5-23.5% only)						
Combustible gas (LEL) 10% max.						
Carbon Monoxide 35ppm max.						
Hydrogen Sulfide 10ppm max.						
Other						

23. Name of person(s) conducting atmospheric testing: _____

24. Testing equipment utilized by (name): _____
Calibration Date: _____ Type:_____ID #_____

25. PPE and safety equipment required for this operation:

_____ Hardhat _____ Eye protection _____Gloves
_____ Face Shield _____ Hearing protection _____ Respirator
_____ Lighting _____ Fire Extinguisher _____ Insulated Clothing/Barrier

26. POS FD Dispatched shall be called to cancel permit @ (206) 787–4653 when work is completed.

27. Permit cancelled: Date: _____Time :_____

SIGNED: _____ (Entry Supervisor)

THIS PERMIT IS VALID FOR ONE (1) SHIFT ONLY

SEAPORT

Port of Seattle "PERMIT REQUIRED" CONFINED SPACE ENTRY PERMIT

EMPLOYEES SHALL NOT ENTER A CONFINED SPACE UNDER ANY CONDITIONS UNTIL IT HAS BEEN PROPERLY EVALUATED!

1. Contractor: _____ 2. Date: _____ 3. Time: _____

4. Name & location of confined space:_____

5. Reason for entry: _____

6. Name of Entry Supervisor: _____

		YES	NO	N/A
7.	Emergency Rescue plan established?			
8.	JHA completed and discussed prior to entry? (attach to permit)			
9.	Fall protection is in place prior to opening the hatch/lid of space?			
10.	The atmosphere been monitored at various depths prior to entry?			
11.	The space is being ventilated?			
12.	All entrants are utilizing full body harnesses and retrieval system?			
13.	Communication between entrant(s) and attendant established?			
14.	All electrical equipment disconnected, locked & tagged out?			
15.	All mechanical and physical hazards are isolated, locked & tagged out?			
16.	Infrared scan of cables/connectors has been performed prior to entry?			
17.	Attendant is standing by the space during entry?			
18.	The completed permit is posted at the entrance to the space?			

19. List all employees who are trained and authorized to enter the space and those acting as attendant(s):

Authorized Entrant(s) _____
_____
_____

Designated Attendant(s) _____
_____
_____

20. Record of atmospheric testing:

Contaminant Tested For: - Limits	**Results**	**Time**	**Results**	**Time**	**Results**	**Time**
Oxygen (19.5-23.5% only)						
Combustible gas (LEL) 10% max.						
Carbon Monoxide 35ppm max.						
Hydrogen Sulfide 10ppm max.						
Other						

21. Name of person(s) conducting atmospheric testing: _____

22. Testing equipment utilized by (name): _____
Calibration Date: _____ Type:_____ID #_____

23. PPE and safety equipment required for this operation:

_____ Hardhat _____ Eye protection _____Gloves
_____ Face Shield _____ Hearing protection _____ Respirator
_____ Lighting _____ Fire Extinguisher _____ Insulated Clothing/Barrier

24. POS FD Dispatched shall be called to cancel permit @ (206) 787–4653 when work is completed.

25. Permit cancelled: Date: _____Time :_____

SIGNED: _____
(Entry Supervisor)

THIS PERMIT IS VALID FOR ONE (1) SHIFT ONLY

AUTHORIZATION FOR ENTRY INTO A PERMIT-REQUIRED CONFINED SPACE RE-CLASSIFIED TO NON-PERMIT REQUIRED STATUS

Location and Description of Confined Space:

_____

Date and Time of Entry:

_____

Purpose of Entry:

_____

Name of Entrant(s):

_____

CERTIFICATION REQUIREMENTS FOR NON-PERMIT REQUIRED STATUS:

NOTE: All requirements must be marked YES and the Entry Supervisor must sign and date prior to entry.

YES / NO	This confined space poses no actual or potential atmospheric hazards, and the work to be conducted during entry does NOT include welding, the use of chemicals, or other activity that could create an atmospheric hazard.
YES / NO	The lockout/tagout procedures necessary to eliminate all hazards from mechanical, electrical, or other energy sources within the space have been completed.
YES / NO	All recognized serious safety hazards with the space have been eliminated.

Entry Supervisor Signature: _____

Date: _____

Hot Work

A. Scope

This section outlines the minimum safety requirements for Hot Work operations conducted by the contractor, subcontractors, and sub-tiered contractors.

B. Purpose

The purpose of the "Hot Work" permit procedure is to implement fire protection precautions, minimize the potential of fire and property damage, as well as possible interruption of Port of Seattle operations.

C. Reference

29 CFR 1926 Subparts F & J, WAC 296-155 Parts D & H, as well as the Cutting & Welding, Flammable and Combustible Liquids and Fire Protection sections of this Manual. Seattle Fire Department Fire Code including permit requirements (105.3.5), including a list of designated hot work facilities.

For the purpose of this section, references made to Port of Seattle Fire Department are for Airport Projects, and references made to Seattle Fire Department are for Seaport Projects.

D. Definition

Hot Work – The use of open flame equipment, gas or arc cutting, welding, brazing, cad welding, or any spark-producing activity.

E. General

The Contractor shall follow all regulations as outlined in the Port's hot work program/procedures, Seattle Fire Department Permit Requirements for cutting and welding, as well as State and federal safety requirements, uniform fire codes, national fire codes, and NFPA standards.

Seattle Fire Department Hot Work Permit Department: 206-386-1400
The following general conditions shall apply to each hot work operation.

1. Airport Projects: A Hot Work Permit is required and shall be issued by the Port of Seattle Fire Department. Call Fire Dispatch at (206) 787-4653 to have the fire department respond to your location to inspect and issue all permits.
2. Seaport Projects: A Hot Work Permit is required and shall be issued by the Prime/General Contractor's designated site safety representative. The permit and permit conditions shall be posted.
3. All Projects: The permit must be in the Contractor's possession before any work begins. Each crew involved in hot work operations is required to have a permit.
4. Hot Work operations will be limited to the area specified on the permit.
5. Airport Projects: POS Fire Prevention shall conduct an inspection of the area in which the Hot Work to take place prior to the work beginning.

6. Seaport Projects: The Prime/General Contractor's designated site safety representative shall conduct an inspection of the area in which the hot work is to take place. The inspection shall take place prior to the work to ensure flammables or combustibles are not present and no possibility of fire exists.
7. When practical, objects to be welded, cut, or heated shall be moved to a designated location.
8. Flammable/combustible materials subject to Hot Work operations shall not be closer than 35 feet of the operation.
9. If the object to be welded, cut, or heated cannot be moved and the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag and protect the immovable hazard or in place property from damage. This can be accomplished through the use of fire retardant plastic or blankets.
10. A fire watch shall be employed and assigned no other duties than those related to observation of the hot work area. This individual shall be trained in the basic operation of firefighting equipment, warning system, and facility layout.
11. The fire watch must observe the area in question through lunch and/or coffee breaks and up to the prescribed time on the Hot Work permit after work has been completed.
12. The Contractor shall supply as a minimum, a 2A:10BC rated fire extinguisher.
13. An additional fire watch may be required on the other side of any wall, partition or lower level if the Hot Work is performed adjacent to a wall or partition or upper level.
14. Airport Projects: The Contractor shall contact Fire Dispatch at (206) 787-5380 in case of fire.
15. Should the use of a fire extinguisher be necessary, a fully charged replacement is required before work can resume. Port of Seattle Construction Safety should be notified for any fire.

16. When air monitoring is required, the Lower Explosive Limit (LEL) must be non-detectable prior to any type of burning, welding, or hot work conducted by the Contractor. (Air monitoring shall be required around or near any areas, which may pose a potential fire or explosion threat from flammable or combustible vapors).
17. The use of open flame devices such as flares, burners or salamanders requires prior review by the POS FD.
18. Open flame heating devices shall not be left unattended while in use.
19. When air monitoring is required, the Lower Explosive Limit must be non-detectable prior to any type of burning, welding, or hot work conducted by the Contractor. (Air monitoring shall be required around or near any areas, which may pose a potential fire or explosion threat from flammable or combustible vapors).

HOT WORK PERMIT

BEFORE INITIATING HOT WORK, CAN THIS JOB BE AVOIDED ? IS THERE A SAFER WAY?

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to : Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding.

PART 1

INSTRUCTIONS

1. Fire safety Supervisor:

A. Verify precautions listed at right (or do not proceed with the work).

B. Complete and retain PART 1

C. Issue PART 2 to person doing job.

_____

HOT WORK BEING DONE BY:

☐ EMPLOYEE _____

☐ CONTRACTOR _____

DATE _____ JOB NO. _____

LOCATION/BUILDING & FLOOR

_____

NATURE OF JOB

_____

NAME OF PERSON DOING HOT WORK

_____

I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work.

_____

SIGNATURE: (FIRE SAFETY SUPERVISOR)

PERMIT EXPIRES:

DATE _____ TIME _____AM / PM

NOTE EMERGENCY NOTIFICATION ON BACK OF FORM. USE AS APPROPRIATE FOR YOUR FACILITY.

REQUIRED PRECAUTIONS CHECKLIST

☐ Available sprinklers, hose streams and extinguishers are in service/operable.

☐ Hot Work equipment in good repair.

Requirements within 35 ft. (11 m) of work

☐ Flammable liquids, dust, lint, and oily deposits removed.

☐ Explosive atmosphere in area eliminated.

☐ Floors swept clean.

☐ Combustible floors wet down, covered with damp sand or fire-resistive sheets.

☐ Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal sheets.

☐ All wall and floor openings covered.

☐ Fire-resistive tarpaulins suspended beneath work.

Work on walls or ceilings

☐ Construction is noncombustible and without combustible covering or insulation.

☐ Combustibles on the other side of walls moved away.

Work on enclosed equipment

☐ Enclosed equipment cleaned of all combustibles.

☐ Containers purged of flammable liquids/vapors.

F

ire watch/Hot Work area monitoring

☐ Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks.

☐ Fire watch is supplied with suitable extinguishers, charged small hose.

☐ Fire watch is trained in use of this equipment and in sounding alarm.

☐ Fire watch may be required for adjoining areas, above, and below.

☐ Monitor Hot Work area for ___ hours after job is completed.

Other Precautions Taken

☐ _____

_____

_____

WARNING!

HOT WORK IN PROGRESS **WATCH FOR FIRE!**

PART 2

INSTRUCTIONS

1. Person doing Hot Work: Indicate time started and post permit at Hot Work location. After Hot Work, indicate time completed and leave permit posted for Fire Watch.
2. Fire Watch: Prior to leaving the area, do final inspection, sign, leave permit posted and notify Fire safety Supervisor.
3. Monitor: After 4 hours, do final inspection, sign and return to Fire safety Supervisor.

_____

HOT WORK BEING DONE BY:

☐ EMPLOYEE _____
☐ CONTRACTOR _____

DATE _____ JOB NO. _____

LOCATION/BUILDING & FLOOR

_____

–

NATURE OF JOB

_____

–

NAME OF PERSON DOING HOT WORK

_____

I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for this work.

_____
SIGNATURE: (FIRE SAFETY SUPERVISOR)

PERMIT EXPIRES:
DATE _____ TIME _____AM / PM

FIRE WATCH SIGNOFF
Work area and all adjacent areas to which sparks and heat might have spread were inspected during the fire watch period and were found fire safe.
Signed: _____

FINAL CHECKUP
Work area was monitored for 4 hours following Hot Work and found fire safe.
Signed: _____

REQUIRED PRECAUTIONS CHECKLIST MAY BE RETAINED AS RECORD OF HOT WORK ACTIVITY

- ☐ Available sprinklers, hose streams and extinguishers are in service/operable.
- ☐ Hot Work equipment in good repair.

Requirements within 35 ft. (11 m) of work

- ☐ Flammable liquids, dust, lint, and oily deposits removed.
- ☐ Explosive atmosphere in area eliminated.
- ☐ Floors swept clean.
- ☐ Combustible floors wet down, covered with damp sand or fire-resistive sheets.
- ☐ Remove other combustibles where possible. Otherwise protect with fire-resistive tarpaulins or metal sheets.
- ☐ All wall and floor openings covered.
- ☐ Fire-resistive tarpaulins suspended beneath work.

Work on walls or ceilings

- ☐ Construction is noncombustible and without combustible covering or insulation.
- ☐ Combustibles on the other side of walls moved away.

Work on enclosed equipment

- ☐ Enclosed equipment cleaned of all combustibles.
- ☐ Containers purged of flammable liquids/vapors.

Fire watch/Hot Work area monitoring

- ☐ Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks.
- ☐ Fire watch is supplied with suitable extinguishers, charged small hose.
- ☐ Fire watch is trained in use of this equipment and in sounding alarm.
- ☐ Fire watch may be required for adjoining areas, above, and below.
- ☐ Monitor Hot Work area for ____ hours after job is completed.

Other Precautions Taken

- ☐ _____
  _____

Lock Out/Tag Out & Conveyor

1. A Shut down notice is filed in advance of the work.

2. Work area/exposed conveyor/conveyor belts protected. When work is performed on a catwalk, a barrier should be placed on the catwalk to prevent material from falling to the work area below.

3. Those working around "moving parts" should refrain from wearing jewelry or loose clothing and restrain long hair from possible contact.

4. Locations for Lockout/Tagout
   - Main Panel Lockout
   - Local Disconnects
   - Bag Diverters/Pushers
   - **NOTE:** Engaging an "E-stop" may shut down the entire system and should only be utilized in an emergency.

Main Panel Disconnect

Step 1 - Notify the controlling Contractor of your intent to perform work on or within 36 inches of the conveyor system.
- If the Conveyor or panels are under the control of the Port, notify the conveyor and electrical shops to assist in the LO/TO of the system.
- If the section of conveyor to be LO/TO is under the control of the Contractor you are working for, they will assist in performing the procedure and coordinating the work.
- If the conveyor is under the control of another Contractor, the procedure will need to be coordinated with that Contractor.
- If working on screening equipment, a LO/TO of that system will need to be performed.

Step 2 – Turn off the power at the Main Control Panel.
- Lock and tagout the switch. Complete the information areas on the tag.
- A lock and tag is required for every employee that will be working on the system.
- Proceed to the location that work will be performed and attempt to start the conveyor to verify it has been de-energized.

Lock Out/Tag Out & Conveyor

Belt Lockout/Tagout

Step 1 – LO/TO at the first local disconnect.
Step 2 – LO/TO at the downstream disconnect.
Step 3 – LO/TO at the upstream disconnect.
Step 4 – LO/TO Bag Diverters/Pushers
Step 5 – Attempt to start the conveyor to verify it has been de-energized.

Start up

STEP 1 – Ensure all employees, tools, and materials have been removed and are clear of the system.
STEP 2 – Notify the controlling Contractor, conveyor, and electrical shops that work is complete.
STEP 3 – Verify with the Contractor and/or Conveyor shop that Step 1 has been completed.
STEP 4 – Remove all locks and tags.
STEP 5 – Restart the system.

- They will remove their LO/TO and restart the system if the system is under the control of the Port or if the system is under the control of another Contractor.

NOTE: Failure to follow these procedures may result in the following:

1. Traumatic injury to unprotected employee(s).
2. Damage to the belts or conveyor system.
3. Damage to the baggage of the public.
4. Delays to the airlines.
5. Suspension or termination of employee(s) involved under the disciplinary action program of the Contractor.

MAIN PANEL LO/TO

BELT LO/TO

LO/TO AT THE LOCAL DISCONNECT (I.E. MOTOR #10)

LO/TO AT UPSTREAM DISCONNECT (I.E. MOTOR #11)

LO/TO AT DOWNSTREAM DISCONNECT (I.E. MOTOR #9)

BAG DIVERTER LO/TO

LOCKOUT / TAGOUT

A. Scope

This section defines the minimum safety requirements for lockout tagout to assure the safety of 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 personnel and property from injury caused by the release of stored energy, or the accidental activation of processes, systems, or equipment.

C. Reference

29 CFR 1910 Subpart S, 29 CFR 1926 Subpart G, WAC 296-803, and WAC 296-155-429, NFPA 70E, Port of Seattle Lockout/Tagout Program, Electrical Safety and Energized Electrical Work sections of this Manual.

D. Definitions

Lockout 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 lockout devices include, but are not limited to, blank flanges, bolted slip blinds, or other similar means.

Tagout Device – A tag used in the Lockout/Tagout Procedure. Examples: Danger, Do Not Operate, Do Not Start.

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 lockout/tagouts, utility outages, utility disruptions, and re-energization/re-pressurizations shall be coordinated through the Engineer.
2. The Contractor's Qualified Person is responsible for ensuring adequate protection is provided through lockout/tagout procedures for all processes, systems, or equipment and personnel under their control.
3. The 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 activate it to ensure positive lockout will then test the system.

5. A lock and tagout device and attachment apparatus shall 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 shall apply their own lock and tag.
7. This procedure applies to energy sources that are mechanical, air, hydraulic, thermal, electrical, chemical or spring loaded.

F. Specific Requirements for Contractors

1. The Contractor's Qualified Person shall brief all employees who will be performing work on the equipment or system to familiarize them with the lockout/tagout procedure before any work is started. The following procedures shall be read and discussed with all craft persons to ensure complete understanding of the procedures.

G. Lockout/Tagout 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 lockout all isolation points and disconnects.
4. Tag all isolation points and disconnects.
5. Airport: Where the main electrical switches and circuit breakers must be used to de-energize a system, Aviation Maintenance shall be contacted to identify the proper controls to be locked and tagged out.

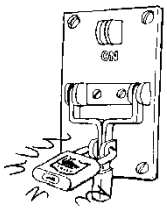
H. Lockout Procedure

1. When more than one employee is working on a system or piece of equipment, each shall apply their own lock and tag to the lockout device.
2. Padlocks are the preferred lockout devices.
3. Locks shall not be a common key type.
4. The individual installing the lock shall retain the key.
5. After the equipment or system has been locked out, attempt to start it to test the effectiveness of the lockout
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.
8. A written procedure must be in place in order to remove any lock and tag when the tag signer is absent from the job site. In addition, the procedure

shall 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 employee. This includes their full name, Contractor name, badge number, and the date.
   2. A signed tag shall always accompany a lock.
   3. Tags shall 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 shall be made by an authorized individual.
      a. 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:
         i. Valve line-up to avoid product spills
         ii. Pressure tests on hydro or pneumatic systems
         iii. Flushes for cleanliness
         iv. Electrical tests for shorts or ground
         v. Rotational/functional tests
   2. A final check of the system should 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 shall be locked and tagged out by a Qualified Person(s).
      b. All electrical gear shall have devices installed or be capable of installation of multiple locks.
      c. In the event a positive lockout cannot be made (such as a toggle switch), the individual switch shall be de-energized and a tagout device installed by the person working on it.
      d. All tagout devices shall be signed and dated by the individual placing it with instruction as to why the tag was placed.
      e. It is the Contractors responsibility to ensure that no work is performed beyond the protection of the lock and tags installed.
      f. The Contractor's lock and tag may not be removed unless the electrical gear is turned over to and accepted by the Port of Seattle. The only exception is the function test performed by the Contractor, after which the Contractor immediately reinstalls their lock and tag.
   2. Energizing New Equipment for the First Time

a. Prior to energizing, the Contractor's Qualified Person and the Port's electrical representative shall inspect all electrical gear to ensure compliance with Part I of this procedure.
b. The Contractor shall furnish and install a "DANGER – HIGH VOLTAGE" sign on all switchgear 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 to be visible from any approach. A sticker reading "HOT" or "ENERGIZED" shall identify all energized circuits in the distribution panels and switchgear. These stickers shall 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. Turnover of Equipment to the Port
   a. As energized, the Contractor turns over equipment to the operations representative, who installs a Port of Seattle lock and "Danger" tag that reads "Port of Seattle" on each starter or breaker released.
   b. After equipment has been turned over to the Port of Seattle and a need develops for the Contractor to work on the equipment, clearance must be obtained from the Seaport Maintenance Electrical Shop in order to accomplish the required work. Locks and tags must be installed as a part of the lockout procedure.
   c. If sections of an energized Motor Control Center are needed to operate equipment turned over to Port of Seattle and the Motor Control Center is still under the Contractor's control, each party will lock and tag the center. This required each party's permission to work in the Master Control Panel involved.
4. 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 persons associated with that activity shall obtain a lock and two (2) Warning tags from the Contractor's Qualified Person. These locks and tags shall be installed on the associated switchgear and the local equipment control switch.
   b. A "Warning" tag that identifies the person by name, badge number, or company shall accompany each lock.
   c. Only the individual who placed the lock and tag shall remove it from the equipment.

CONVEYOR POLICY

A. Scope

This section defines the minimum safety procedures for working around live conveyors at the Port of Seattle.

B. Purpose

The intent of this section is to minimize the dangers and risks associated with working around moving belts and pulleys.

C. Reference

29 CFR 1910, WAC 296.155-545, WAC 296-806, ANSI B20.1-2000 and the Lockout/Tagout section of this Manual.

D. Definitions

Barricade - A temporary structure set up over, under and/or next to a conveyor system to protect personnel from injury and prevent damage to or loss of the conveyor system.

Guard - A device, attachment or covering, either temporary or permanent, put on a conveyor system to protect personnel from injury and prevent damage to or loss of the conveyor system.

E. General

1. Baggage Handling Conveyor Systems start and stop without notice! The Baggage Carousels and transfer belts located in both the public and bag well areas are deemed a part of this system.
1. Contractors shall not use Baggage Handling Conveyor Systems for a work surface, or for access to/from any work surface.
2. Contractor's personnel shall be trained on the above procedures. Training can be set-up through the Construction Safety Department.
3. The Contractor shall submit procedures for working over, under or next to conveyors to the Port of Seattle for review and acceptance, prior to beginning any work. These procedures will be submitted using the Job Hazard Analysis Worksheet contained in the Port of Seattle Construction Safety & Health Manual.
4. A 36-inch clear space above the conveyor must be maintained at all times while working over operating conveyors.
5. At all times while working above an operating conveyor or public work area, the conveyor or work area must be protected from any tool, materials, or workers from landing on the conveyor belt, by use of a temporary barricade.

Lock Out/Tag Out & Conveyor

F. Energy Isolation Procedures for Working Above, Below or Next to an operating conveyor
    1. Lockout/Tagout shall be accomplished in accordance with the Port of Seattle Construction Safety & Health Manual.
    2. Guards and Barricades shall be comprised of Fire Resistant material.
    3. If you must work within the 36-inch window, you must perform the work under/during a Port of Seattle accepted shutdown request with the conveyor system locked and tagged out.
    4. A temporary barricade or solid guard must be placed on the underside of the conveyor pan any time you must perform work below an operating conveyor in close enough proximity to which any tools, equipment, materials, or workers may come within 36-inches of moving conveyor belts, pulleys, or rollers.
    a. Guards must be installed under/during a Port of Seattle accepted shutdown request with the conveyor system locked and tagged out.
    5. A conveyor shall be shutdown, locked and tagged out prior to any work close enough in proximity for any tools, equipment, materials, or workmen to come within 36-inches above, below or next to a conveyor, which cannot be guarded.
    6. If there is an unguarded chain or V-belt drive or other hazard within the work area, it must be temporarily barricaded or guarded to prevent any tools, equipment, materials, or workmen from coming in contact or entangled in a drive, prior to the commencement of work.
    7. Emergency Stops (E-Stops) are only for emergencies and not to be utilized as an isolation device

NOTE: Notify the Port of Seattle Maintenance Shop of any removed/missing Conveyor System guards.

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 and impacts to the public.

C. Reference
International Fire Code (IFC) Section's 305 and 605 for the heaters; and IFC Chapter 38 for Liquid Propane Gas

D. Definitions
Below Grade – Any underground level deeper than the Bag Well.

Carbon Monoxide - CO

Liquid Propane – LP

E. General Requirements
1. Portable heaters shall be listed, installed, used, and maintained in accordance with the manufacturer's recommendations.
2. Portable heaters, while in operation and unattended shall be bracket mounted and elevated above the floor surface.
3. Portable heaters shall be equipped with "tip-over" protection.
4. Portable heaters shall be switched "off" at the end of each shift unless a following work shift will occupy the area.
5. Proper housekeeping shall be maintained in areas of portable heaters.
6. Portable heaters shall be installed with proper clearance in regard to combustible material, equipment, and construction.
7. Portable heaters shall be monitored for safe operation and maintained in proper working condition.
8. When operated in enclosed structures, adequate ventilation shall be maintained.
9. Building materials shall be fastened securely or guarded so as not to contact portable heaters.
10. Contractors violating these procedures shall remove the portable heaters from service.

F. Requirements for Liquid Propane Heaters/Devices
   1. The use of Liquid Propane below grade is prohibited by the Port of Seattle Fire Department. Authorization to use LP Gas below grade shall be required by the POS FD in writing.
   2. Liquid Propane is Carbon Monoxide producing. When CO producing equipment is utilized “indoors”, the Contractor shall have a plan in place to monitor and mitigate the hazard to workers.
   3. A Hot Work Permit is required for LP heaters and salamanders.
   4. Adequate ventilation shall 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 shall 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 shall 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 shall be stored in a suitable ventilated area.
   4. Cylinders shall be secured against displacement.
   5. Cylinders shall be stored away from fire, flame, or heat.
   6. Warning signs prohibiting smoking or open flames shall be posted, maintained, and enforced 25 feet around storage areas.
   7. Fire protection shall be provided with at least one approved portable fire extinguisher with a rating of not less than 20:BC.

Energized Electrical Work

A. Scope
This section defines the minimum safety requirements for all Contractor personnel to ensure compliance with regulatory requirements applicable to electrical systems on the Port of Seattle construction projects.

B. Purpose
To minimize hazardous electrical exposures to all personnel who perform work in any electrical substations, rooms, cabinets, vaults and manholes within reach of live parts (electrical wires, cables and equipment) of 50V to ground or higher, on POS construction sites.

C. Reference
29 CFR Part 1926-Subpart K, 1910-Subpart S, WAC 296-45, The National Electrical Code (NEC), ANSI Z89.1 & Z87.1, and NFPA Article 70, 70E, & 79, and the Electrical Safety and Lockout/Tagout sections of this Manual..

D. Definitions
Attendant System - A safety system that employs one person functioning as a dedicated Qualified EEW Attendant while another is performing Energized Electrical Work. A single person may function as an EEW Attendant for two persons if they are working on the same system and are both in a single line of sight from a single observation point.

Blast Suit - Properly rated hood, face shield, gloves, hardhat, and Nomex or equivalent outer clothing combination.

Classified Location Rating – Ratings applied to Hazardous Locations based upon the presence of flammable gases or vapors; the handling, use or processing of flammable vapors; the presence of combustible dust or easily ignitable fibers or filings.

Compelling Reason - A situation where greater operational health, safety or environmental hazard exists if equipment is de-energized or if an essential continuity of service is halted. Examples of Compelling Reasons include:

a. Operational Limitations: Includes impacts to critical Tenant Operations, Homeland Security, Security Systems, Emergency Alarm Systems, Illumination and Life Safety Systems, US Customs, Public, or unmarked circuits.
b. Troubleshooting/Systems Analysis: Includes tracing circuits, and Troubleshooting.
c. Emergency Situations: (usually completed post event)

Electrical Hazard - An electrical condition where the possibility of injury or incident is present due to an exposed energized circuit.

Energized Electrical Work

Energized Electrical Work (EEW) - Any work requiring performance of duties on or near an exposed energized circuit with magnitude greater than 50 volts to ground or 240 volt-amps.

EEW Permit - Document authorizing Qualified Persons to perform installations or repairs on energized electrical equipment and/or systems.

Hazardous Locations - Class I, Division 1 and 2 Locations as specified in the NEC and NFPA.

Infeasible Shutdown – A situation, determined by a senior level manager where EEW must be performed in lieu of de-energizing the system to complete the work.

Metering – The task of electrical testing with an approved electric indicating instrument such as a voltmeter, ammeter, etc.

One-Hand Rule – The EEW Attendant/Standby Person physically reaching the person performing EEW with one hand in the event of an accident. The one hand rule shall not be used when a single EEW attendant is functioning for two persons.

Properly Rated and Tested – The term itself applies to specific tools or equipment and cannot be universally applied to ***all*** tools or equipment. Given that, PPE, such as rubber insulated gloves or sleeves or tools, such as mats that require a certification must be properly rated and tested.

Qualified EEW Attendant - A person assigned to monitor the individual performing Type 4 EEW.

Qualified Person - A person who is familiar with the construction, operation, and hazards of the specific equipment involved and has had training in avoiding the electrical hazards of working on or near exposed energized parts. This person shall meet the requirements of this document.

Qualified Person as an EEW Attendant - A person assigned to monitor the individual performing Type 5 EEW.

Qualified Supervisor – The individual responsible for all aspects of the work, issuing EEW permits, and maintaining safe working conditions in relation to this section.

Safe Work Distances – The minimum distance personnel may approach exposed energized parts without protective insulation or PPE.
Testing & Metering – Diagnosis and analysis of electrical systems to trace or determine voltage and/or current on circuits.

Troubleshooting – Investigation techniques employed to locate the source of an equipment malfunction.
Volt-amps – Circuit voltage (volts) multiplied by current (amperes).

E. General
   1. All personnel who perform work on electrical systems shall be qualified.
   2. Work is to be performed de-energized at all times in accordance with the Port of Seattle's Lock-out/Tag-out Procedures found in this Manual unless it can be demonstrated that the use of de-energized work practices introduces additional or increased hazards or is not feasible. Documented Compelling Reasons must be provided.
   3. Only Qualified Persons shall work on electric circuits/systems that have not been de-energized.
      a. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.
   4. Access into electrical substations, rooms, cabinets, vaults and manholes is restricted to Qualified Persons only, unless the equipment is de-energized or a Qualified Person is in supervision of the unqualified personnel making access:
      a. Before entry and upon exit, the Contractor shall notify the Resident Engineer and either the Seaport Maintenance Electrical Shop or the STIA Electrical Shop and file a Shutdown Notice if required.
      b. Before entry is made into energized electrical cable vaults or manholes, an infrared tester shall 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 shall not be made. The Contractor shall notify the Engineer and the Maintenance Electrical Shop.

F. Protection of Employees
   1. The Contractor shall identify any medium or high voltage areas that may be involved in the project and immediately notify the Engineer if they have not been properly identified.
   2. A Task Specific Job Hazard Analysis (JHA) shall be conducted and documented prior to beginning any Energized Electrical Work.
   3. The scope of work must be communicated and understood by all parties involved.
   4. Personnel shall not wear conductive items when working on or within the defined Safe Working Distance of energized electrical equipment. These items include, but are not limited to watches, bracelets, rings, conductive-framed glasses, earrings, badge clips, and clothing with metal snaps and buttons. If conductive items cannot be removed they must be covered with a non-conductive material.
   5. EEW in Hazardous Locations should be avoided. This work should only be performed after a thorough analysis has been made to verify the work can be performed safely. Compelling Reasons shall be documented on the EEW Permit.
   6. Clearances around electrical cabinets, transformers, switchgears, etc. shall be maintained in accordance with WAC 296-155-444(10) and POS requirements.

7. The use of temporary coverings (blankets), insulated tools, mats, and PPE reduces the risk to the employee conducting the work however; it does not reduce the Energized Electrical Work to a lower type.
8. No EEW may be performed without approved insulated tools. The hand tools must be specified in the JHA and be manufactured to meet the requirements of the work.
9. Areas around exposed/energized equipment must be properly barricaded and/or secured to prevent accidental contact and maintain a safe work environment.
10. Personnel should not employ practices that provide a current path through any part of their body. Every effort should be made to practice the "one-hand rule" when the task allows.
11. Unless identified for use in the operating environment, no conductors or equipment shall be located or operated in damp or wet locations. Ground Fault Circuit Interrupters (GFCI) shall be used when any work must be performed in these locations. The Contractor shall inspect and maintain the GFCI system. Documented inspections shall be monthly or more frequent as conditions dictate.

G. Safe Working Distances
   1. The Contractor shall ensure that no person approaches or takes any conductive object closer to exposed energized parts than set forth below unless:
      a. Personnel are insulated from the energized part; or;
      b. The energized part is insulated from personnel.

Voltage Range (phase to phase)			Minimum Approach Distance
< 300 V			Avoid Contact
> 300 V	and	< 750 V	1 ft. 0 in. (30.5 cm)
> 750 V	and	< 2 kV	1 ft. 6 in. (46 cm)
> 2 kV	and	< 15 kV	2 ft. 0 in. (61 cm)
> 15 kV	and	< 37 kV	3 ft. 0 in. (91 cm)
> 37 kV	and	< 87.5 kV	3 ft. 6 in. (107 cm)
> 85.5 kV	and	< 121 kV	4 ft. 0 in. (122 cm)
> 121 kV	and	< 140 kV	4 ft. 6 in. (137 cm)

H. Electrical Work in Hazardous Locations:
   1. Work on equipment that is rated for use in Hazardous Locations that will violate the Classified Location Rating is not permitted. For example, work that requires the opening of explosion proof enclosures in a classified location must be performed de-energized, locked and tagged out.
   2. If there is a potential for combustible vapors in a work area a test of the area shall be made with a combustible gas meter prior to and during the duration of any EEW. Work must be halted immediately if any combustible gas or vapor is detected.

Energized Electrical Work

I. Appropriate Safe Work Practices Matrix
The appropriate safe work practices to be used for a project or task are based upon the highest Electrical Work Type and Energy Magnitude until proven to be a lesser type.

Electrical Work Type:	Energy Magnitude	Work Specifics	Testing/ Metering Operations	Typical Minimum Safety Equipment Required **	Attendant Required	EEW Permit Requirement
Type # 1* **	Zero Volt Amps	De-energized, locked and tagged out, meter and check all sources of power before beginning work.	Meter only to ensure no power.	Safety glasses and hardhat or as defined by a Job Hazard Analysis	**No**	**No**
Type # 2* **	Covered Energized Circuits less than 600 Volts	Permanent covers in place, equipment designed for metering and testing that will prevent any accidental bodily contact with electrical or RF energies	Meter and test only by means of designed testing points with all covers in place.	Safety glasses and hardhat or as defined by a Job Hazard Analysis	**No**	**No***
Type # 3* **	Less than 240 Volt-Amps and less than 50 Volts, visual inspections less than 600 Volts	Obtain approval to perform work, verify test equipment functionality, determine location of shutdown points and voltage, and ensure proper tools are available	Meter, test, or troubleshoot within voltage and Volt Amp ranges.	Safety glasses w/ non- conductive frames or as defined by a Job Hazard Analysis	**No**	**No***
Type # 4	Energized Electrical Work on exposed circuits 50 to 600 Volts	Determine “Compelling Reason”, verify test equipment, determine shutdown locations and voltage, tag breakers, ensure area is properly barricaded,	Metering and testing with any covers removed allowing for direct contact within this voltage range.	Reference Part J. of this Section	**Qualified EEW Attendant**	**Yes**
Type # 5	Energized Electrical Work on circuits greater than 600 Volts	Work involving potential direct physical contact with energized exposed circuits greater than 600 Volts. Ensure the area is properly barricaded with non-conductive material.	Metering and testing with covers removed exposing over 600 volts.	Reference Part J. Of this Section	**Qualified Person as an EEW Attendant**	**Yes**

* ANY energized work (Types 2-5) performed in a Hazardous Location requires an EEW Permit
** Individual tasks must be reviewed for PPE requirements.
*** Work should be classified at the highest level until testing is complete

J. Energized Electrical Work Types/Procedures

Energized Electrical Work

NOTE: The following procedures should be common to all electrical work for the respective types. Additional task specific procedures and equipment should be included when developing the work plan. In all cases the work should be classified at the higher rated level until it has been determined to be a lower one.

1. Type 1 - De-energized, Locked & Tagged out
   a. File Shutdown Notice for the equipment/systems.
   b. De-energize all power sources including backup power, lock and tag-out and verify all electrical sources are at zero voltage. Ensure that POS Lock-out/Tag-out procedures are followed.
   c. Verify functionality of test equipment and ensure it is properly rated for maximum potential voltage to be tested, including valid calibration date. .
   d. No Attendant System or EEW Permit/Checklist is required.
   e. PPE to consist at a minimum of hardhat and safety glasses.
2. Type 2 - Covered, Energized Circuits Less Than 600 volts
   a. Verify that all covers are in place..
   b. Verify functionality of test equipment and ensure it is properly rated for work to be performed, including valid calibration date.
   c. No Attendant System or EEW Permit/Checklist is required.
   d. PE to consist at a minimum of hardhat and safety glasses
3. Type 3 – Energized Work On Exposed Electrical Systems (50 Volts or less)
   a. Obtain approval from owner to do work.
   b. Verify functionality of test equipment and ensure it is properly rated for work to be performed and calibrated.
   c. Determine the voltage, location of shutdown points, and any other associated hazards.
   d. Ensure proper tools and test equipment are available for the work to be done and in proper working conditions.
   e. No Attendant System is required.
   f. EEW Permit is required if the work to be performed is in a Hazardous Location.
   g. PPE shall consist of as a minimum non-conductive hardhat and safety glasses.
4. Type 4-Energized Work on Exposed Electrical Systems Greater Than 50 Volts and Less Than 600 Volts
   a. A Compelling Reason for performing EEW must be provided by the Contractor's Project Manager on the EEW Permit.
   b. Verify functionality of test equipment and ensure it is properly rated for work to be performed and calibrated.
   c. Determine voltage, location of shutdown points, and other potential hazards.
   d. Apply warning tags that inform others that work is being completed on interrupting breakers/switches. The tag should be placed at the nearest level

up-stream power source to prevent re-closure and re-energizing of equipment/systems. (Power distribution systems only)

e. The specific safety equipment will vary based on the potential hazard. The correct PPE, insulated tools, and procedures for safe practices should be documented in the job hazard analysis. The safety equipment may include but is not limited to the following:
   i. ANSI approved hard hat
   ii. ANSI approved safety glasses with non-conductive frames
   iii. Rubber insulated mats or boots
   iv. Properly rated and tested rubber gloves
   v. Properly rated and tested rubber sleeves
   vi. Body hook
   vii. Approved insulated tools
   viii. Face shield
   ix. Fire extinguisher
   x. Nomex or equivalent outer clothing
   xi. Properly rated and tested Blast Suit
   xii. Cotton clothing
   xiii. Insulated mats and/or boots shall be used when working on conductive surfaces for Type 4 and 5 work
   xiv. Barricade and/or secure the area.

f. Upon completion of job or shift:
   i. (Power distribution systems only) Retrieve all upstream warning tags.
   ii. Return upstream warning tags to the Qualified Supervisor (power distribution systems only).

5. Type 5 - Greater than 600 volts
   a. In addition to Type 4 requirements above:
   b. All Type 5 Energized Electrical Work must be planned with documentation of sequenced steps, safety precautions, and equipment needed to perform the job safely. An electrical engineer will approve the documentation. If this work is routine, procedures should be outlined in PM procedures and on line checklists.

K. Permit System
   1. Contractor's Project Manager shall complete the Compelling Reason portion of the EEW Permit and sign.
   2. Qualified Supervisor shall complete and sign the EEW Permit and Checklist, ensure all other appropriate signatures are on EEW permit, forward a copy to the Resident Engineer and Construction Safety Services Manager, and post the permit at the work area.
   3. EEW Attendant shall sign permit
   4. See Appendix A for a copy of the EEW Permit

L. Responsibilities

Equipment Owner/Operator and Maintainer of Equipment.

1. Ensure Contractors have proper procedures to safely perform the work.
2. Assist in scheduling to minimize system downtime.

Contractor's Project Manager

1. Reads, understands and conveyed the application and importance of this EEW Program to their Qualified Supervisor.
2. Evaluate tasks performed at Types 4 & 5 for engineering controls that would reduce the work to Type 3 or below.
3. Understands the scope & hazards associated with the work they are approving
4. Establish a means to enforce compliance with the requirements of this program.
5. Ensure that there are a sufficient number of personnel trained and available to perform the work.

Contractor Qualified Supervisor

1. Has read and understands this EEW Program.
2. Understands the scope & hazards associated with the work they are performing.
3. Ensure that permits are completed, understood, and signed for all EEW.
4. Verifies that all employees performing electrical work have current training certifications and skills necessary to perform the work.
5. Ensures either POS STIA Electrical Shop or Seaport Maintenance Electric has been notified
6. Ensure that the Attendant System is used.
7. Completes and explains the JSA to all employees involved.
8. Predetermines emergency procedures.
9. Ensure the maintenance and calibration of testing equipment
10. Ensures the availability and use of PPE.
11. Submitted completed EEWP to Resident Engineer and Manager of Construction Safety Services

Qualified Person

1. Has read and understands this EEW Program.
2. Understands the scope of work.
3. Understands and complies with all electrical safe work procedures and requirements as described in the EEW Program.
4. Has the experience required to perform work on the respective equipment and understand the hazards associated with the work.
5. Completed the following training requirements:
    a. CPR/First Aid -Every two years
    b. Hazardous Energies – annual

Qualified EEW Attendant

1. Has read and understands this EEW Program.
2. Understands the scope of work.

3. Understands and complies with all electrical safe work procedures and requirements as described in the EEW Program.
4. Knows location of disconnects and how to de-energize.
5. Has no other duty than to observe the work without interfering with worker and without participating in the work.
6. Has completed the following training requirements:
7. CPR/First Aid -Every two years
8. Basic Electrical Safety

Qualified Person as an EEW Attendant

1. In addition to the responsibilities listed for an EEW Attendant, the Qualified Person as an EEW Attendant must also have:
2. Equivalent knowledge of the Qualified Person and of the equipment.
3. Understand the scope of work.
4. Complete the following training requirements:
    a. CPR/First Aid -Every two years
    b. Basic Electrical Safety
    c. Intermediate Electrical Safety
    d. Advanced Electrical Safety - Annually

Contractor's Health & Safety Manager

1. Has read and understands this EEW Program.
2. Ensure quality training is provided.
3. Ensure documentation of training and procedures.
4. Audits the work process to assure that safe electrical work practices are being implemented.
5. Coordinates the completion of the Job Hazard Analysis with the Qualified Supervisor.
6. Communicate requirements to and concerns Sr. Management.

Energized Electrical Work Permit

CONTRACTOR: _____PROJECT #: _____

EQUIPMENT TO BE WORKED ON: _____

EQUIPMENT/PANEL: _____ VOLTAGES: _____

EEW TYPE: _____

WORK TO BE PERFORMED:

_____

_____

_____

Has the EEW Permit Checklist been completed? _____

The Compelling Reason a shutdown is infeasible:

_____ Operational Limitations _____ Troubleshooting / System Analysis _____ Emergencies

Detailed explanation of Compelling Reason:

_____

_____

_____

_____

I authorize the Energized Electrical Work due the above reason(s):

Project Manager: _____ Date: _____

INDIVIDUALS ASSIGNED TO THE WORK CREW

I certify that I am qualified to carry out the work described above, and that I understand and will follow the EEW Program and all safety procedures necessary to complete the job safely.

Qualified Person	_____ Print	_____ Signature	_____ Date
Qualified Person	_____ Print	_____ Signature	_____ Date
EEW Attendant	_____ Print	_____ Signature	_____ Date
Qualified Supervisor	_____ Print	_____ Signature	_____ Date

Energized Electrical Work Permit Checklist

Please check each of the following as they are completed

___A Emergency telephone number: _____ (verified).
___B. Location of nearest telephone: _____.
___C. Emergency equipment is located at the work area.
___D. Up-line breaker has been tagged for panel distribution systems: Yes: ____ No: ____
Location of up-line source of power: Building: _____ Area: _____
Panel: _____ Circuit: _____
___E. Location of Emergency Power Off (EPO) or Emergency Machine Off (EMO) buttons confirmed (if applicable).
___F. Test meter available, calibrated and tested for reliability and accuracy.
___G. The attendant is to perform no other duties than observe and ensure that safety procedures are followed.
___H. Cable temperature readings taken prior to entry into manhole or vault and are acceptable.
___I. A current copy of the panel schedule verified breaker positions are attached to this permit.
___J. Task specific JSA completed and reviewed with the workers.
___K. All work other procedures reviewed. (If possible, open equipment in de-energized state and review work to be done.)
___L. Barriers placed to keep unauthorized personnel clear of work area.
___M. Other forms of Hazardous Energy not required for work are properly locked/tagged out
___N. Confirmed adequate illumination. (Flashlights are not acceptable.)
___O. All conductive personal articles removed or covered.
___P. Metal fasteners on clothing (zippers, snaps, buttons & pins) are not exposed.
___Q. Clear evacuation path identified.
___R. Tools in good condition. (Check insulation on handles.)
___S. Appropriate Personal Protective Equipment in place (includes properly rated and tested gloves, sleeves, face shields and blankets).

CLOSING CHECKLIST - POST SERVICE

___1. Visual inspection/test performed to verify all tools, jumpers, grounds, etc. removed.
___2. Employees exposed to hazards associated with re-energizing are notified of systems impending status change.
___3. Visually confirm all employees are clear of circuits and equipment.
___4. Equipment re-energized.
___5. Barriers Removed
___6. Upstream warning tags removed (if applicable)
___7. EEW Permit filed.

This checklist shall be attached to the EEW Permit.

STS Controlled Entry Procedure

A. Scope
This section defines the procedures for entry into the STS tunnels by Contractors, subcontractors, and sub-tier contractors.

B. Purpose
The intent of this section is to minimize the dangers and risks to personnel.

C. Reference
Port of Seattle

D. General
All Contractor, Consultant, or POS personnel requesting access to the STS Tunnels shall follow this procedure:

1. All personnel shall first undergo a training class on STS procedures. This training is held in the STS Maintenance facility and can be scheduled through the STS staff.
2. Prior to any access, a Shutdown Request must be submitted through and approved by the STS Manager or authorized representative.
3. At the start of each work shift, the Contractor's supervisor shall contact the STS Supervisor by radio and meet in person in the STS Maintenance shop area for authorized access into the tunnels.
4. The Contractor's supervisor requesting access to the STS tunnels shall in person describe the Contractor's work plan and request any assistance required by the STS Supervisor.
5. The STS Supervisor shall log into the STS FDR Log System a list of all Contractors working in the STS Tunnels, the status of STS Tunnel roadway power and any special tunnel setup requests or conditions.
6. It is the responsibility of the Contractor's supervisor to make sure all individuals under their control follow the work plan for the shift.
7. Contractor's persons found in the STS Tunnels not checked in with the STS Supervisor and logged into the FDR Log System will be asked to leave will be subject to disciplinary action.
8. Each Contractor (and subcontractor) must check in and be logged into the STS FDR Log by the STS Supervisor each work shift. Check in is good for one work shift only.
9. If the Contractor's work plans change, the supervisor shall notify the STS Supervisor immediately.
10. When work is complete, the Contractor's supervisor shall make radio contact with the STS Supervisor and shall acknowledge that all persons within his supervision are out of the tunnels. Radio communications shall be very clear and understandable. If communication is unclear, the persons shall make arrangements to meet and confirm a complete understanding.
11. It is the responsibility of the STS Supervisor to log in STS FDR log the clearing of the STS Tunnels by each Contractor or subcontractor.
12. The STS Supervisor will then perform a physical check of the entire tunnel area before the trains are placed into automatic operations.
13. In the event of an emergency where STS needs to move trains through the work area for failure management, verbal radio verification by the Contractor shall be made to ensure personnel are cleared.

Under Dock Work

A. To Whom Does this Apply? Contractors who work under docks must receive education in potential hazards, reporting procedures and use of radios and life jackets. The procedures outlined in this summary apply to all Contractors who must work under marine docks whether in work boats or on platforms

B. Key Program Elements

Use of Life Jacket and Radio – Contractors must wear a life jacket and take a marine radio.

Contractor Departure, Check-In, and Return Reporting Responsibilities:

1. Advise Contractor Safety Representative* when leaving the boat moorage of estimated time of arrival where dock work will be done.
2. Contact Contractor Safety Representative* before going under dock. Give estimate of the time when you will be coming out from under the dock. Do not proceed without confirmation that message has been received by Dispatch.
3. Contact Contractor Safety Representative* at scheduled lunch break even if work is not complete.
4. Contact Contractor Safety Representative* when you are finished under dock. Give the following information:
    a. Next location for under dock work or advise of intent to return to moorage;
    b.. Estimate time of arrival at next location or moorage.
5. Contact Contractor Safety Representative* to notify, when you have returned to moorage and are out of the water.

Contractor Safety Representative* Responsibilities – Contractor Safety Representative will log all communications on the status board. The Contractor Safety Representative will ensure that contractor(s) check-in as required and will advise relief Contractor Safety Representative of status of under dock work. In case of lost communications the Contractor Safety Representative will make appropriate contacts with 911, and the Resident Engineer. The Resident Engineer will contact facilities and Port of Seattle Seaport Maintenance.

NOTE: The Resident Engineer is responsible for monitoring under dock activity at the Seaport. It is the responsibility of the Contractor to manage the communications and monitoring for under-dock work and to keep the Resident continually aware of the under-dock work status. Any other projects requiring under-dock work must establish a similar contact for monitoring the progress and safety of employees doing this type of work.

C. Education and Training

Employees must be informed of safe practices for under dock work.

Under Water Confined Space Hazards for SCUBA Divers

Underwater Confined Spaces Pose Serious Hazards for SCUBA Divers
In March 1997, a tragic fatality incident occurred involving inadequately trained SCUBA divers entering an inverted, underground irrigation siphon used to convey water under roadways and other terrain. The underground siphon is a permit-required confined space. Four divers were killed; two of them were rescue divers. Additionally, two backup rescue divers nearly perished. These diving fatalities emphasize the need to ensure that dive personnel entering a confined space are commercial divers, specifically trained for confined space diving. Moreover, employers must ensure a comprehensive dive plan is in place as well as appropriate supervision for these types of extremely dangerous diving scenarios.

What is an underwater confined space?
Any underwater confined space is any underwater situation in which there is an "overhead environment" obstructing direct vertical access to the open water surface. Underwater confined spaces also may exhibit the characteristics of other confined spaces such as limited number or size of openings for entry and exit.

The following examples are typical underwater confined space diving situations:

- Sewer line installation, repair, and maintenance
- Irrigation siphon repair, maintenance, and debris removal
- Underwater dredging and construction activities, which involve an overhead environment, with limited direct access to the water's surface
- Ice diving
- Recovery and rescue operations (which can be necessary in the above situations)

Washington Administrative Code (WAC) further defines confined space through its Permit-required Confined Space Entry Standard (WAC 296-809). This standard protects workers from the hazards associated with confined space entry operations.

Some hazards associated with underwater confined space diving:

Because underwater confined spaces contain many unique dive hazards, confined space diving (also known as "cave diving" or "penetration diving") requires highly specialized training. A primary hazard is the existence of a "ceiling" which restricts direct access to the surface, requiring the diver to be completely dependent upon properly functioning equipment. Should an emergency occur, the diver cannot make a free ascent to the surface. Many divers, unaware of the consequence of having a ceiling, fail to plan for such an emergency.

Other hazards associated with the confined space "ceiling" include the fact that normal open water rules for air reserves are inadequate. It often takes more air to exit a confined space than it takes to enter. Additionally, any kind of labor intensive diving requires much more air. It is also imperative that divers be aware of elevation changes

in confined space dives. Deeper dives result in increased air volume requirements due to increases in pressure. Yet another frequently unrecognized confined space diving hazard is disorientation. Divers in confined spaces can easily lose sight of landmarks and thereby lose direction. This can cause confusion and ultimately lead to panic.

These are only a few of the many hazards associated with confined space dives. Before entering a confined space, divers must always acquire the necessary training and certification. In addition, employers who contract divers to perform work of this nature must be aware that this is considered a special category of commercial diving, requiring substantial experience and skill. Employers must also comply with the rules regulating commercial diving and confined space (Washington Administrative Codes (WAC) 296-37 and 296-809, respectively).

Some safety recommendations:

- Ensure that the dive is absolutely necessary and that all alternatives have been considered
- Prepare a dive plan
- Accurately calculate air supply with special attention to elevation changes, i.e. pressure changes during the dive which can increase air requirements
- Tether and tend all divers in the water
- Utilize open circuit SCUBA only after all other alternatives (such as surface supplied air) have been exhausted
- Utilize communication and retrieval systems that can be operated from the surface
- Implement a permit-required confined space entry program with formal training and practice

Need more information?

More information about confined space diving is available from:

- Professional Association of Diving Instructors (PADI): (800) SAYPADI
- http://www.padi.com/scuba/default.aspx
- National Association of Underwater Instructors (NAUI)
- http://www.naui.org/
- Association of Diving Contractors (ADC)
- http://www.adc-int.org/
- Scuba Schools International (SSI)
- http://www.divessi.com/
- National Association of Cave Divers (NACD)
- http://www.safecavediving.com/

See pages 253-282

READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any "Notes" boxes such as this one--you should remove these "Notes" sections as you go. Also, do a search for all bracket characters " [ ] " as they are used to show you areas containing options or project specific details (you can use Microsoft Word's Find feature {Ctrl-F} to jump to an open bracket " [" character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document's built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style "Numbered Material" and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the "Numbered Material" format.

PART 1 GENERAL

1.01 CONTRACTOR FULLY RESPONSIBLE FOR SAFETY

A. The Contractor assumes full and sole responsibility for and shall comply with all laws, regulations, ordinances, and governmental orders pertaining to safety in the performance of this Contract. The Contractor shall conduct all operations under this Contract to offer the least possible obstruction and inconvenience to the Port, its tenants, the public and abutting property owners. The Contractor shall be responsible for employing adequate safety measures and taking all other actions reasonably necessary to protect the life, health, and safety of employees, the public, and to protect adjacent and Port-owned property in connection with the performance of the Work.

B. The Contractor shall have the sole responsibility for the safety, efficiency, and adequacy of the Contractor's plan, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the Project Site, including safety of all persons and property in performance of the Work. This requirement shall apply continuously, and is not limited to normal working hours. Nothing the Port may do, or fail to do, with respect to safety in the performance of the Work shall relieve Contractor of this responsibility.

1.02 REFERENCES

A. The Contractor shall comply with the provisions found in the Port of Seattle Construction Safety & Health Manual, the Federal Occupational Safety and Health Act of 1970 (OSHA), including all revisions and amendments thereto; the provisions of the Department of Safety & Health (DOSH) Washington Industrial Safety Act of 1973 (WISHA); and the requirements of the following chapters of the Washington Administrative Code:

1. Chapter 296-24 WAC General Safety and Health Standards.
2. Chapter 296-62 WAC General Occupational Health Standards.
3. Chapter 296-155 WAC Safety Standards for Construction Work.
4. Chapter 296-800 WAC Safety & Health Core Rules

5. ANSI/ASSE Standards

B. In addition, the Contractor shall comply with the following requirements when they are applicable:

1. Local Building and Construction Codes.
2. POS Fire Department Standards
3. Latest FAA Advisory Circular regarding Operational Safety On Airports During Construction.
4. United States Coast Guard
5. Seattle Fire Department Codes
6. NFPA 70E
7. National Electrical Code

NOTE: In cases of conflict between different safety regulations, the more stringent regulation shall apply.

Seaport Projects: Delete 1.02.B.2 & 1.02.B.3. Airport Projects: Delete 1.02.B.4 & 1.02.B.5

1.03 DEFINITIONS

A. Manager, Construction Safety Services

An employee of the Port or designated consultant who is responsible for the day-to-day management of the Port of Seattle's Construction Safety Program, and such agents, including the Field Safety Manager, as authorized to act in his/her behalf.

B. Field Safety Manager

An employee of the Port or designated consultant who conducts and monitors jobsite inspections and verifies Contractor compliance with identified corrective actions.

1.04 SUBMITTALS

A. The Contractor shall submit the following information as found in paragraph 1.05 A

B. The Contractor shall submit a site specific Chemical Exposure Plan prepared by a Certified Industrial Hygienist for any products containing isocyanates, methylene chloride, Hydrofluoric Acid, lead, silica, and processes involving floor sealers, traffic coatings, terrazzo sealers, or specialty paints. The plan shall include employee exposure control methods, isolation methods to prevent spread of chemicals outside the work area and safeguarding of the public.

1.05 CONTRACTOR RESPONSIBILITIES

A. SITE SPECIFIC SAFETY PLAN

1. The Contractor shall submit, for the Port's review and comment, a Site-Specific Safety Plan in connection with the Work. The submittal shall be made in accordance with Section 01 32 19, Pre-Construction Submittals. An outline of the matters to be address in the Safety Plan is set forth in Appendix A to this Division. The Port's review of, or comment on, the Safety Plan shall not, in any way, relieve the Contractor of any

responsibility or liability for the Safety Plan. Delay in submitting a written safety plan will not constitute grounds for a contract schedule extension or delay claim.

2. The Port will not issue a Notice to Proceed (NTP), until the Safety Plan has been received and accepted by the Engineer and Manager of Construction Safety Services.

B. GENERAL OBLIGATIONS

The Contractor is responsible for accident prevention and job site safety. This responsibility cannot be delegated to Subcontractors, suppliers, the Port, or other persons. To this end, the Contractor shall:

1. Promote a safe and healthy work environment.
2. Provide an accident prevention program.
3. Promote training programs to improve the skill and competency of all employees in the field of occupational safety and health.
4. Instruct all employees of safe work methods and practices when assigning work.
5. Ensure that employees have and use the proper protective equipment and tools for the job.
6. Ensure that all heavy equipment operators (i.e. cranes, loaders and forklifts) are properly qualified and trained on the specific piece of equipment in use.
7. Plan and execute all work to comply with the stated objectives and safety requirements contained in the contract provisions, Federal, State, local laws and regulations, and industry standards.
8. Cooperate fully with the Port and its Consultants and insurers (if applicable) in connection with all matters pertaining to safety.
9. Maintain an orientation program for new employees, including subcontractor employees, that includes at a minimum, a review of:
    a) Potential hazards in the work areas
    b) Required personal protective equipment and apparel
    c) The following prohibited conduct shall result in the immediate removal from the project: gambling, fighting or horseplay, possession of firearms, alcohol or illegal use, possession or sale of a controlled substance or being under their influence.
    d) Emergency procedures
10. Perform documented daily inspections of the project in the Contractor Daily Report. Review and direct immediate action to correct any substandard safety conditions or practices, including those of any Subcontractor, regardless of classification.
11. Hold a minimum of one weekly scheduled safety meetings with its employees. Such meetings shall include a discussion of all observed unsafe work practices or conditions, a review of the accident experience

and all corrective actions. The Contractor shall encourage safety suggestions from employees.

12. Hold a minimum of one monthly all-hands safety meeting with its employees, and subcontractor employees - subcontractors at any tier. An agenda shall be prepared and distributed for this meeting. The meeting shall include a safety update, and pertinent safety information for upcoming work. The Contractor shall encourage input and involvement from the subcontractors.

13. Ensure prompt medical treatment is administered to any injured employee.

14. Undertake a complete investigation of all accidents and implement corrective action to prevent a recurrence.

15. Prepare and implement a site safety plan as set forth in Paragraph 1.05. A hereof.

16. Comply with the Administrative Procedures set forth in Paragraph 1.08 hereof.

17. Provide the Engineer and Manager of Construction Safety Services with copies of all DOSH citations immediately upon receipt.

18. Ensure that all of its subcontractors, suppliers, etc., are provided with a copy of this specification and are informed of their obligations regarding safety.

19. Ensure that all Contractor and subcontractor personnel at any tier have completed a one and one-half (1 ½) hour Port of Seattle safety orientation to be held by the Port of Seattle at a time and location to be to be specified by the Port, prior to commencing work. The time expended and any associated costs such as travel time, parking, and other expenses are to be borne by the Contractor.

C. CONTRACTOR SAFETY REPRESENTATIVE

1. It is recognized that the responsibility for safety lies with the Contractor. Each Contractor shall appoint an individual(s) responsible for safety on each contract. This individual(s) must be employed in a supervisory position, empowered by their employer to take corrective action; be present on the project while work is being performed; and spend the amount of time necessary to ensure the Contractor's compliance with safety requirements.

2. A safety inspection shall be performed and documented for each shift worked, by the Contractor's safety representative.

3. The Contractor shall submit a resume of the experience and qualifications for the proposed Safety Representative(s) as part of the Safety Plan submittal. Please refer to part D. Definitions, subparagraphs 1 and 2 below. The Port will review the resumes and a personal interview may be required. The Port may reject anyone it deems "Not Qualified."

Add the following paragraph 4 when applicable. To determine applicability, consult the Manager of Construction Safety Services and Construction Manager.

4. [The Prime contractor shall provide three (3) of their site management personnel and three (3) - four (4) of their major Subcontractors shall

provide one (1) site management person, to attend a two (2) day Safety Management training, presented by the Port. The Port shall make the final determination on the attendees.]

D. FOREMAN SAFETY RESPONSIBILITIES:

1. Foremen are key individuals in an effective safety program. Their pro-active efforts toward accident prevention on their daily assignments help determine the degree of safety that exists on the job. A foreman's safety responsibilities include the following as a minimum:

a) Inspect his/her assigned job areas to ensure that unsafe acts or conditions are identified and corrected

b) Ensure that safety requirements are adhered to and enforced

c) Provide and require the use of proper personnel protective equipment and suitable tools for the job

d) Set a good example for his/her crew in the matter of safety

e) Ensure that orderliness and good housekeeping are maintained

f) See that his/her assigned crew is properly instructed in the safe work practices when assigned to job tasks

g) Investigate all accidents that occur in areas under their direction to determine facts necessary for corrective actions

h) Promptly assist in the completion of accident reports per contract requirements

i) Conduct weekly toolbox safety meetings with personnel to discuss unsafe work practices and conditions identified

j) Review accident investigations and corrective actions implemented

k) Encourage personnel to make suggestions regarding safety and to pass these on to supervision

l) Ensure that prompt first aid is administered

E. DEFINITIONS

1. Fulltime Safety Professional qualifications include:

a) Shall have no other duties.

b) An individual possessing a minimum of five years progressive experience managing safety programs on large construction projects comparable to this contract in scope and complexity.

c) Be knowledgeable concerning all federal, state, and Port of Seattle regulations applicable to construction safety.

d) Possess "Competent Person" certification in construction safety disciplines related to the work performed and possess verifiable training. This individual shall also be responsible for identifying "Competent Persons" required by State and Federal safety standards for which they are not certified.

e) Have successfully completed the OSHA 500 Safety and Health Course. This requirement may be waived in lieu of a safety and health degree or professional safety certification.

f) Training and current certification for CPR and First Aid is preferred.

g) Be capable of performing accident investigations and developing a concise report.

h) Is proficient in the development and presentation of “tool box” meetings and safety training.

2. Site Safety Officer qualifications include:

a) An individual assigned to perform safety functions on any contract not requiring a Fulltime Safety Professional. This can be a collateral duty position held by a supervisor. Safety duties shall take priority over other collateral duties.

b) Possess a minimum 5 years progressive experience in their trade.

c) Be knowledgeable concerning all federal, state, and Port of Seattle regulations applicable to safety.

d) Have successfully completed the OSHA 30-hour Safety & Health Course.

e) Possess “Competent Person” certification in construction safety disciplines related to the work performed and possess verifiable training. This individual shall also be responsible for identifying “Competent Persons” required by State and Federal safety standards for which they are not certified.

f) Be trained in, and possess current certification for CPR and First Aid.

g) Possess verifiable training and be capable of performing accident investigations and developing a concise report.

h) Possess verifiable training in the development and presentation of “tool box” meetings and safety training.

For Port Construction Services small works contracts, replace OSHA 30-hour with OSHA 10-hour in 2 d above.

F. DETERMINATION

1. When the number of personnel on any shift is under 40 (including Subcontractor employees), the Contractor’s safety representative will meet the definition of “Site Safety Officer” as defined above for each shift.

2. For Contractors with a total of 40 or more personnel (including Subcontractor employees) on any shift, a Fulltime Safety Professional as defined above shall be required for each shift.

3. For each additional 75 employees (including Subcontractors employees) on any shift, a second Fulltime Safety Professional shall be required.

4. At the Port's discretion the requirements for Contractor safety personnel can be reviewed and action taken to decrease or increase the number of individuals.

5. The Contractor Safety Officer/Professional (s) shall be primarily responsible for ensuring Contractor's compliance with the safety requirements provided in this Division. Without limiting the generality of the foregoing, the Contractor Safety Officer/Professional (s) shall:

   a) Review all subcontractor and sub-tier contractor's Site Specific Safety Programs and Job Hazard Analysis (JHA) for compliance with applicable POS Construction Safety, State and Federal Standards and ensure that they receive a copy and are briefed on Document 01 35 29 Safety Management.

   b) Perform a site-specific safety orientation for all employees, subcontractors and sub tier contractors prior to beginning work. This is in addition to the Port's safety orientation.

   c) Perform daily safety inspections of the Contractor and Subcontractor's project to evaluate the project for unsafe conditions and/or practices, and take the appropriate corrective action when required.

   d) Immediately report all injuries of personnel, vehicles, "Near Miss" incidents and property damage to POS Manager, Construction Safety Services and insure immediate corrective action is taken. Assist in the preparation of all accident investigations and ensure reports are submitted within 24-hours.

   e) Ensure meaningful, weekly safety meetings are held for all on-site employees. Provide the job foremen with appropriate training materials to conduct weekly "tool box" safety meetings and attend safety meetings to evaluate their effectiveness. Maintain documentation of topics discussed and attendees, with copies submitted to the Engineer or included with Contractors Daily Construction Report.

   f) Be responsible for the control, availability, and use of necessary safety equipment, including personal protective equipment and apparel for the employees.

   g) Shall attend a monthly safety committee meeting scheduled by the Manager of Construction Safety Services to discuss and resolve relevant issues related to safety and health on Port of Seattle projects.

6. Contractor Safety Officer/Professional (s) not performing their duties in accordance with this document, shall be replaced at the Port's discretion by an individual meeting the requirements of this section. In addition, the Contractor Safety Officer/Professional (s) may not be removed from this contract or replaced without the Port's advanced written approval. The Contractor shall notify the Engineer and Manager of Construction Safety Services when this person cannot be on duty while work is being

performed and shall submit the name(s) and qualifications of the individual assigned to perform said duties.

G. ACCIDENT PREVENTION

1. The Contractor has the responsibility to correct hazardous conditions and practices. When more than one Contractor is working within a given job site, any project management personnel shall have the authority to take action to prevent physical harm or significant property damage. If it is determined there is “Imminent Danger” the Contractor shall:

   a) Take immediate action to remove workers from the hazard and stabilize or stop work until corrective actions can be implemented to eliminate the hazard.

   b) Immediately identify and implement corrective action to eliminate the hazard.

   c) Immediately notify the Engineer, and Manager of Construction Safety Services or others as necessary. The Engineer will notify the proper authorities if the damage cannot be promptly corrected and could develop into an emergency.

   d) Each worker shall immediately report any condition suspected to be unsafe or unhealthy to their job foreman or safety representative. If there is no resolution of the concern at that level, the employee shall report the concern to the Engineer and Manager of Construction Safety Services.

H. ON SITE FIRST AID

1. This section is designed to assure that all employees in this state are afforded quick and effective first-aid attention in the event of an on the job injury. To achieve this purpose the presence of personnel trained in first-aid procedures at or near those places where employees are working is required. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

   a) Each employer must have available at all worksites, where a crew is present, a person or persons holding a valid first-aid certificate.

   b) All crew leaders, supervisors or persons in direct charge of one or more employees must have a valid first-aid certificate.

   c) For the purposes of this section, a crew means a group of two or more employees working at any worksite.

   Additionally, the Contractor shall:

   d) Post emergency procedures which shall include telephone numbers and locations of facilities including, but not limited to, hospitals, physicians, police, fire and emergency medical services, in conspicuous locations at the job site and at all telephone locations.

e) Provide in a readily accessible location, first-aid supplies of sufficient size and number to handle common first-aid incidents.

f) Identify personnel qualified to render first aid with suitable emblems affixed to the rear of their hard hats for identification.

g) Regularly discuss actions to be taken during emergencies with the Contractor's supervisory personnel and at "tool box" safety meetings.

1.06 PORT OF SEATTLE'S RIGHTS

A. INSPECTIONS/INVESTIGATIONS

1. The Port may, in any reasonable manner, observe and inspect the Contractor's safety and accident prevention procedures for all activities and personnel working at the construction sites, including the Contractor, subcontractors, visitors, and materials or equipment suppliers. This specifically includes, but is not limited to, the right to attend all safety meetings.

2. The Port shall receive written copies of accident or incident reports completed by the Contractor within 24-hours of occurrence, using the accident investigation reports found in the Port of Seattle Construction Safety & Health Manual or contractor equivalent. This reporting shall include but not be limited to those reports prepared pursuant to OSHA and/or DOSH regulations.

3. The Port may, in any reasonable manner, observe or participate in any accident investigation conducted by the Contractor or anyone performing work for, on behalf of or under the Contractor. The Port may also, at its sole discretion and in any reasonable manner, undertake its own accident investigation.

B. CORRECTIVE ACTIONS/STOP-WORK

1. The Port shall have the right to require the Contractor to address unsafe working conditions, including taking corrective action when unsafe working conditions are observed (i.e., lack of good housekeeping practices, use of equipment in obviously poor condition, failure to adhere to statutory construction regulations, etc.).

2. The Port shall have the right to require the removal from the work site of any person, property or equipment that, in the Port's opinion, is deemed unsafe.

3. The Port shall have the right to require the Contractor to immediately cease any action and/or stop the Work (or any portion thereof) in the event that any condition exists that, in the Port's opinion, constitutes an imminent danger or serious harm.

4. The Port shall have the right to suspend the Work (or any portion thereof) pending the completion of any accident/incident investigation, whether undertaken by Contractor, the Port or others.

C. PORT'S ACTION/INACTION DOES NOT RELIEVE CONTRACTOR

1. Nothing the Port may do, or fail to do, with respect to safety in the performance of the Work shall relieve the Contractor of its responsibility to comply strictly with this Division and all standards referenced in Section 1.02 of this document.

D. PORT'S ACTION/INACTION NO BASIS FOR ADJUSTMENT

1. The Port's exercise of any rights under this Paragraph 1.06 shall not be a basis for any adjustment in the Contract Price or Time.

E. PORT OF SEATTLE INCLUDES CONSULTANTS

1. As used in Document 01 35 29 the terms "Port of Seattle" and "Port" specifically includes the Port's designated consultants.

1.07 PORT MANDATED SAFETY REQUIREMENTS

A. Prior to Notice to Proceed (NTP), the Contractor's Project Manager and Safety Representative shall meet with the Engineer and Manager of Construction Safety Services to review and discuss the safety requirements of this contract.

B. SPECIFIC SAFETY PROVISIONS

1. In addition to Federal, State, and Local regulations pertaining to operations and safety, the Contractor shall adhere to the following Port mandated safety requirements:

a) Asbestos and Contractor Personnel Asbestos Training: Ensure that all Certified Asbestos workers have current certifications, and ensure that all other site workers, including subcontractors, have received the initial and annual Asbestos Awareness training prior to the start of work.

b) Entry into Confined Spaces: Work on this project may require entry into confined spaces as defined by WAC 296-809. The Contractor shall read and follow the requirements of the Port of Seattle's Confined Space Entry Program, as found in the Port of Seattle Construction Safety and Health Manual. The Contractor's Confined Space Entry Program must meet or exceed these requirements.

1) The Contractor shall provide the Engineer a copy of its Confined Space Entry Program as part of the Contractor's Safety Plan Submittal. As part of this submittal, the Contractor shall complete the "Confined Space Entry Program Certificate" (Appendix B).

2) Should the Contractor employ subcontractors to work in confined spaces it shall be the Contractor's responsibility to submit the required documentation for each subcontractor.

3) No work shall be allowed to start in a confined space until the required submittals have been made. In the event the Contractor does not comply with these regulations, ACCESS WILL BE DENIED and the Engineer notified. Delays caused by failure to submit the required documentation shall not be considered a reason for extension of contract time.

c) Electrical - Safe Clearance Procedures

1) Entry into High Voltage Areas: Work on this project may require entry into manholes, vaults, electrical rooms or other High Voltage areas.

2) In the event entry is required, the Contractor is obligated to identify any High Voltage areas that may be involved in the project and immediately notify the Engineer if they have not been properly identified. Before entry into a High Voltage work area the Contractor shall notify the Engineer and contact STIA Electrical Shop at (206) 787-5311(Airport) or the Seaport Electrical Shop at (206) 787-3350.

d) Fire Prevention: The Contractor shall ensure that fire prevention measures on-site are in accordance with OSHA, DOSH, NFPA and POS standards. Approved safety cans shall be used for flammable and combustible liquids. Signs and fire extinguishers shall be provided where required.

e) Traffic Control: Ensure compliance with Section 01 55 26 Traffic Control.

f) Hazardous Materials: Ensure compliance with Section 01 57 23 Pollution Prevention Planning and Execution.

g) Open Flame Devices: Prohibit the use of unapproved fuel-burning types of lanterns, torches, flares or other open-flame devices on Port property.

h) Hot Work Permit:

1) Seaport: Open Flame Welding and spark producing equipment and tasks require the Contractor to implement a formal “Hot Work Permit” Program outlined in the Port of Seattle Construction Safety and Health Manual. Cutting and Welding tasks also require the Contractor to secure a “Hot Work Permit” from the Seattle Fire Department in accordance with Supplementary Conditions 00 80 00 Article SC-04.12 Permits, Licenses, Fees and Notices.

2) Airport: Open Flame Welding and spark producing equipment and tasks require the Contractor to secure a “Hot Work Permit” from the Port Of Seattle Fire Department in accordance with Supplementary Conditions 00 80 00 Article SC-04.12 Permits, Licenses, Fees and Notices

i) Liquid propane storage and use below grade is prohibited.

j) Excavating & Trenching: Coordination with the Engineer shall be required for work performed on the site.

k) Construction activities that pose a potential risk of exposure to contaminated soil (such as excavations) shall be supervised by personnel who have both a current 40-hour Hazardous Waste certification, and an 8-hour Hazardous Waste Supervisor’s certification. These individuals shall be able to identify the potential

need for upgrading the level of health and safety protection. All personnel working in direct contact with contaminated soil shall have a current 40-hour Hazardous Waste certification and medical monitoring, as required in Hazardous Waste Operations, Chapter 296-843 WAC and in accordance with OSHA regulations. The plan shall also include emergency procedures and medical treatment, fire protection, Job Hazard Analysis (JHA), and PPE requirements.

l) The Contractor is responsible for soil sampling and air monitoring to determine hazards and exposures to their employees.

m) Safety plan shall include guidelines for the protection of construction-related workers against occupational musculoskeletal injury risk factors arising from operations connected with the construction, maintenance and repair, and demolition of structures, using a hierarchy of controls. Manual Material Handling, Body Positioning and Dynamic Stretching shall be addressed. Contractors will need to consult with their Safety Professionals to determine which tasks require an ergonomics prevention program and which selection of controls are needed to minimize injury.

n) As defined in WAC 296-155 – Part L, individuals involved in operating hoisting equipment, including but not limited to cranes, boom trucks, and forklifts so configured, shall possess recognized certification. Additionally, qualified riggers and signal persons shall also possess recognized certifications. Copies of the certification(s) shall be submitted in accordance with Section 01 32 19 Pre-Construction Submittals.

o) Personal Protective Equipment Policy: To reduce the possibility of injuries, the Contractor shall implement a policy that requires 100% use of hardhats, safety glasses, and gloves for all personnel under their control. It is the responsibility of the Contractor to supply the proper personal protective equipment for the task.

p) Protection of the Public: The Contractor shall submit a plan for the protection of the public on or adjacent to construction and demolition operations. This plan shall include, but not be limited to, barricades, fencing, and signage. "Public" is defined as anyone not associated with the project - general public, POS and tenant employees.

q) At the Port’s request, provide safety awareness training for Contractor supervisory personnel and Port management in one or more of the following: cranes & rigging, electrical, fall protection, trenching & excavation, steel erection, heavy equipment, public protection.

r) AOA Operations: Ensure compliance with Section 01 35 13.13 Operational Safety on Airports during construction.

s) Foreign Objects Debris (FOD): Ensure compliance with Section 01 35 13.13 Operational Safety on Airports During Construction.

For Port Construction Services small works contracts, remove 1.07.B.1.r above. Seaport Projects; Delete 1.07.B.1.s

C. DISCIPLINARY ACTION MATRIX:

1. Defining “The Plan”

a) The object of this matrix is to consistently and effectively control safety hazards such as unsafe acts, and unsafe conditions that lead to injuries of employees, the general public, or that cause property damage.

b) The matrix also provides a basis for the Contractor’s program by standardizing how safety infractions committed by those employees will be handled.

c) All employees of the Contractor, subcontractor, sub tier contractor, vendor, or tenant are covered under this matrix regardless of classification.

d) Damage to equipment or property due to unsafe act or using damaged equipment.

e) Listed are the minimum requirements for discipline. The Contractor has the right to incorporate more stringent procedures from their corporate policy into this matrix. The Contractor shall not submit two Disciplinary Action Programs.

f) Individuals observed by the Contractor’s management shall be disciplined under this matrix.

g) Individuals observed by the Port of Seattle management shall also be subject to disciplinary action. POS management shall immediately contact the Contractor’s management or provide written information to the Contractor’s management as to violation, time, date, employer, and employee.

h) The Contractor’s Safety Manager shall perform the act of documenting and distributing the “Written Violation Notice.”

2. Defining “Violation”

a) Violations are defined as:

b) “General Violations” are considered to be those infractions that may not cause serious injury or illness to an individual but are still violations of written safety policies and procedures. Examples include housekeeping, unregulated ACM incidents, property damage, mushroomed tools, etc. “General Violations” do not necessarily require a written warning unless they become classified as “Repeat Violations.”

c) “Serious Violations” are those violations that if left uncorrected could cause serious injury or illness to an individual. Examples include employees exposed to fall or impalement hazards or serious bodily harm.

d) "Imminent Danger" are violations/situations that will most likely cause permanent disability or death to an individual. Examples can include falls, electrical, or trenching hazards and unsafe equipment.

e) "Repeat Violations" are situations that arise as a result of a previously identified infraction not being abated in the time frame required or numerous violations of the same classification. "Repeat Violations" can also be defined as a situation where one supervisor has multiple employees working under their direction who are in violation of a written Federal, State, project, or company policy.

f) Violations are not limited to the examples listed above.

NOTE: An "employee" may be removed from the project at any time for a safety violation that endangers his life or the life of a fellow employee.

3. Defining "Employee"

a) As mentioned earlier, all employees of the Contractor, subcontractor, vendor, or tenant are included in this program.

b) Job title classifications can include but are not limited to trades person, foreman, supervisor, superintendent, etc.

c) Any person (s) directly reprimanded for their own actions or inactions, regardless of their position, shall be reprimanded as a "Worker."

4. Defining the "Procedure"

a) Individuals observed committing infractions of written Federal, State, site, or company safety policies shall be brought to the attention of the Contractor's management.

b) The contractor shall in a timely manner, notify the identified employee(s) that they are in violation of written safety rules or procedures and shall abate the hazard.

c) In the event of "Imminent Danger or" a "Serious Violation", the Contractor or POS shall immediately notify and remove the employee(s) from the hazardous situation.

d) The Contractor shall provide timely written warning to the identified individual(s), as well as the direct supervisor and superintendent of that individual(s). The supervisor's names shall be recorded on the "Written Violation Notice."

e) To discourage "Repeat Violations" or supervisor apathy, the supervision is subject to disciplinary action as stated in the matrix.

f) The Contractor shall utilize the "Written Violation Notice" provided in this section.

5. Defining the "Results"

a) Personnel (including supervisors) receiving a Written Violation Notice shall be retrained in the appropriate standard or procedures.

Said training shall be documented in writing and submitted to the Engineer.

b) Written Violation Notices received will remain in force for the duration of the project.

c) Removal from the project of an "employee" for a minimum of 3 working days.

d) Removal of an "employee" from any Port of Seattle project for one year.

e) Written notice sent to the appropriate corporate president.

f) Copies of all "written violation notices" are to be submitted to the Engineer with a copy forwarded to the Manager of Construction Safety Services within 24-hours of issuance of notice.

DISCIPLINARY ACTION MATRIX

FOCUS POINT /INCIDENT	1ST VIOLATION	2ND VIOLATION	3RD VIOLATION	NOTES
Worker	Verbal & Written Notice	3 Days Off	Removed From POS Projects For One Year	
Worker's Direct Foremen	Written Notice	Written Notice	3 Days Off	3 Worker Lay-offs = Removal From POS Projects For One Year
Worker's Direct Superintendent	Written Notice	Written Notice	Written Notice to Sub/Prime Superintendent and President of Sub/Company	3 Worker Lay-offs = 3 Days Off For Superintendent
Prime Contractor's Superintendent	Written Notice	Written Notice	Written Notice to President of Prime Company	3 Worker Lay-offs = 3 Days Off For Superintendent*

*Document 01 35 19 - Safety Management, this individual may also be removed from the project.

DISCIPLINARY ACTION MATRIX

WRITTEN VIOLATION NOTICE

PROJECT NAME: _____ PROJECT #: _____

CONTRACTOR: _____

EMPLOYEE BEING REPRIMANDED _____

DATE: _____ TIME: _____

VIOLATION:

_____
_____
_____
_____
_____

TASK BEING PERFORMED:

_____
_____
_____
_____
_____

CORRECTIVE ACTION/TRAINING REQUIRED:

_____
_____
_____
_____
_____

WITNESS: _____

FOREMAN: _____

SUPERINTENDANT: _____

GC SUPERINTENDANT: _____

FIRST NOTICE: _____ SECOND NOTICE: _____ THIRD NOTICE: _____

EMPLOYEE LAY-OFF OR REMOVAL REQUIRED (YES/NO): _____

WRITTEN NOTICE TO COMPANY PRESIDENT REQUIRED (YES/NO): _____

ISSUED BY: _____ COMPANY: _____

D. SAFETY PERFORMANCE

If the Contractor experiences ongoing safety concerns such as a Lost Work Day Case or Recordable Incident Rate greater than the Bureau of Labor Statistics National Average for Construction, experiences repeated violations of safety & health rules and regulations or “Imminent Danger” situations, or fails to abate violations in a timely manner, the Contractor shall be subject to the following action at the Ports discretion:

1. Removal and replacement of management personnel.
2. Submit a written Safety Recovery plan to the Engineer and Manager of Construction Safety Services detailing what changes will be made to their safety program and a timeline as to when the changes will be implemented.
3. Hiring an independent safety consultant who shall audit the Contractor’s procedures and operations. The consultant shall compile a plan detailing what changes the Contractor shall implement. This report shall be submitted to the Engineer, Construction Manager, and Manager of Construction Safety Services.
4. Notwithstanding 01 35 29 paragraph 1.05 (B)(9)(c), Disciplinary Action Matrix, above in 1.07 (C)(2), shall be used for determining the appropriate corrective action.
5. Conduct a “Safety Stand Down” (suspend all work or any portion thereof) in accordance with the provisions of the General Conditions 00 70 00, Article G-10-04 Port’s Right to Stop the Work for Contractor Non-Performance. Suspended work shall not be allowed to resume until the Contractor has completed the following actions for review and acceptance by the Engineer:
    a) Hazardous conditions leading up to the Safety Stand Down shall be abated.
    b) Training of such type and duration shall be conducted to educate personnel on the awareness of, identification of, and correction of hazards leading up to the stand down.
    c) Document the completion of items a. and b. above.

E. TOUR GUIDELINES

1. It is imperative that the highest degree of protection is afforded to all individuals touring any Port construction site. The following guidelines have been prepared as general instructions for the organization, direction and safe conduct of such tours:
    a) Escorted Visitors: While on the job site, non-construction personnel or groups shall be accompanied at all times by an authorized representative, the Engineer, the Contractor or other designee familiar with the job site.
    b) Notification and Tours: Personnel tours including technical inspections need to be cleared through the Engineer, allowing maximum advance notice. The Engineer shall be consulted to coordinate the tour plan, identify specific rules, and to ensure necessary safety precautions are taken.

c) Safety Enforcement: Before entering a job site, all visitors must be informed regarding the need for careful, orderly conduct and notified of any special hazards that may be encountered.

d) Personal Protective Equipment: All visitors and tour groups must comply with proper dress, footwear, personal protective equipment or other safety requirements deemed appropriate.

1.08 CONTRACTOR ADMINISTRATIVE PROCEDURES

A. PROJECT SAFETY INSPECTIONS

1. Unsafe conditions or acts having the potential to cause bodily injury or property damage are classified as either “Imminent Danger” or “Serious.” In either case, action shall be taken immediately to correct the situation. Any item(s) that cannot be corrected immediately are required to be abated within 24-hours of notification. In the interim, other steps shall be taken to insure the safety of employees or the public.

2. The Construction Safety Inspection Report (CSIR) will be used by the Port Construction Safety Management as the field report for recording the Safety Manager’s observations in Section One(see Appendix D).

The following instructions apply to the use of this form:

a) Contractor’s Corrective Action (Section Two): The Contractor shall note the action taken to abate the observation. If an item is abated immediately, it will be so noted in Section One by the Port Safety Manager.

b) Date Corrected: The Contractor, upon completion, shall enter the date in the appropriate column.

c) Submittal Procedure:

1) Projects utilizing the CDMS system (Livelink) will use this system to transmit the CSIR Report between the Port and the Contractor until the observation is satisfactorily resolved.

i. Email distribution will be used on projects not utilizing LiveLink

2) When corrective action has been completed, the Contractor’s Project Manager or Designee will electronically sign and date the form and return it to the Engineer via LiveLink or email (to a designated Port Engineering Staff Member).

3) A member of the Port’s Engineer’s staff will review the form and follow-up to ensure the “Contractor’s Corrective Action” has been addressed, initialing each item corrected.

4) The Engineer will discuss the noted observations at the Weekly Contractor Progress Meeting.

5) The electronically signed copy of the form shall be returned to the Manager of Construction Safety Services within five working days via Livelink.

B. ACCIDENT INVESTIGATION AND REPORTING PROCEDURES

1. All accidents and incidents occurring from operations or work performed under the contract shall be reported, verified, investigated, and analyzed as prescribed by the Port of Seattle Construction Safety & Health Manual. Contractors and other individuals involved in the work shall instruct employees and other personnel to follow these procedures if someone is injured.

   a) Seek medical assistance for anyone injured. The injured person's supervisor will see that first-aid is administered.

   b) When a serious accident or emergency occurs/exists, secure the incident area tightly and quickly except for rescue and emergency personnel.

   c) Send individuals as required, to assist or direct any emergency personnel arriving on the site.

   d) The accident scene shall not be disturbed until released by the Incident Command or Manager of Construction Safety Services, except for circumstances where "Imminent Danger" exists to those performing any emergency services.

   e) Immediately notify the Engineer and Manager of Construction Safety Services (or designee) regarding any accident or injury requiring more than First Aid treatment, any third-party incident, or any equipment or property damage estimate in excess of $1,000. Notify the Manager of Construction Safety Services of all other incidents including near miss incidents as soon as possible following the event.

   f) Washington State Department of Labor and Industries must be notified immediately by the Contractor in the event of an accident involving the death or hospital admission of any employee.

   g) Employees must report all injuries or occupational-related illnesses as soon as possible to their employer or immediate supervisor.

   h) A detailed written report, identifying causes and recommending corrective action, must be submitted to the Engineer and Manager, Construction Safety Services within 24 hours. No supervisor may decline to accept a report of an injury from a subordinate.

   i) Within 48-hours of a Recordable or Lost Work Day Case Injury, incident involving 3rd party, or property damage incident, the Contractor shall meet with the Engineer and Manager of Construction Safety Services. The meeting shall discuss the status of the injured employee, the root cause of the incident, corrective action implemented, the Job Hazard Analysis, and retraining of the employee and supervisor.

   j) Report all accident exposures and near miss incidents that occur on the job site. These records are to be maintained and submitted to the Engineer or other designated authority upon request and shall include but not be limited to:

1) First-aid injuries not reported on the OSHA No. 300 Form.

2) The Contractor's OSHA 300 Form.

k) The above information shall be provided only to authorized personnel including the Engineer and Manager of Construction Safety Services.

l) All questions from the media regarding any incident occurring on site shall be referred to the Port's Public Affairs Manager via the Engineer.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. No separate measurement or payment will be made for the work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price bid for the Project].

End of Document

APPENDIX A

SAMPLE CONTRACTOR'S SAFETY PLAN

The Contractor is responsible for reviewing the requirements found and referenced in this Document, the Contract, the Port of Seattle Construction Safety & Health Manual as a minimum, and incorporating any additional specific or unique safety requirements into their written plan. The Contractor's Safety Plan shall include but not be limited to the following guidelines:

A. GENERAL PROVISIONS

1. **Compliance**: Provisions for accident investigations and reporting, formal incident review, reporting, corrective action and disciplinary action procedures meeting the minimum Port of Seattle requirements.

2. **Job Hazard Analysis (JHA)**: The Contractor shall complete detailed, written Job Hazard Analysis for the work to be performed, identifying hazards that may exist or be created, outline the equipment to be used, and what procedures and/or safety equipment will be used to eliminate or reduce those hazards. The Contractor shall use the form provided in the Port of Seattle's Construction Safety & Health Manual or contractor equivalent. Supplemental Daily Pre-Task Plans are strongly encouraged.

3. **Medical Treatment**: Provide medical treatment in compliance with Federal, State and local requirements. Names of individuals CPR and First Aid trained.

4. **Site Specific Emergency Procedures**: As related to injuries, weather or emergencies at an active POS facility including pre-determined sites for assembly and measures for accounting of employees shall be included. Emergency numbers shall be posted at the given work area(s):

Fire or Ambulance from a non-Port hard-line phone	911
Fire or Police from a Port hard-line phone	9911
Fire or Police Emergency (Airport)	(206) 787-5380
Fire (Seaport)	911
Police (Seaport)	(206) 787-5380

5. **DOSH/OSHA Requirements and Personal Protection**: Safety and health provisions for providing adequate lighting, ventilation, hearing conservation, CO monitoring, and housekeeping. A written Personal Protective Equipment Assessment for head, face, eye, hand and torso protection shall be included.

6. **Personnel Instruction**: The Contractor must identify the greatest number of employees to be working at any one time during peak construction periods, the company policies for initial safety indoctrination of all employees, and company plans for continued safety education for all employees, including: weekly safety meetings, POS Safety Orientation,

Ergonomics, Asbestos Awareness training, and English as a second language.

7. **Responsibilities**: Acknowledgment that the Contractor is totally responsible for compliance with OSHA, DOSH, Port or other applicable rules and orders. Additionally, the plan will require a place of employment that is free of unsanitary or hazardous conditions that would harm an employee's health or safety.

8. **Safety Inspections**: Detailed information concerning how safety inspections will be conducted, their frequency, and their documentation.

9. **Safety Personnel**: State the name of the Contractor's Safety Representative(s), their experience and qualifications (i.e. Training in the OSHA 500 (or equivalent), 30-hour or 10-hour) Indicate their authority to take the appropriate measures to eliminate hazards or stop work until hazardous conditions are corrected.

10. **Safety Requirements, Electrical**: Testing, inspection and repair of electrical equipment, GFCI Program, lockout/tagout procedures, how existing circuits will be located and the installation of electrical circuits in accordance with the National Electric Code or Port Mandated Requirements.

11. **Safety Requirements, Equipment**: Operation, documented daily inspection, and maintenance for trucks and heavy equipment such as backhoes, dozers, motor graders, elevated work platforms, powered industrial trucks, and all hand and power tools.

12. **Safety Requirements, Ladders**: Types of ladders for specific uses and their training requirements.

13. **Site Layout**: A layout drawing of the site indicating access roads, fire and ambulance lanes, location of first aid stations, location of required alarm systems, location of offices, parking for private vehicles and equipment, and storage of all flammable and/or combustible liquids, gases, or other hazardous materials.

14. **Storage**: Requirements for storage of flammable and combustible liquids or gases.

15. **Field Sanitation**: Provisions for toilet and hand washing facilities, including the frequency at which they will be cleaned and maintained.

B. SPECIAL PROVISIONS

Depending on the type of construction, additional items must be incorporated into the Contractor's Safety Plan.

1. **Confined Space Entry**: Procedures for confined space entry and work operations in and around confined spaces (including elevator shafts) as well as emergency measures. These procedures must meet or exceed the Port of Seattle requirements found in the Port of Seattle Construction Safety & Health Manual. Prior to daily entry, prime/general contractor shall be notified.

a) **Airport**: . When entry is to be made into a Permit Required Confined Space the Port of Seattle Fire Department Emergency Dispatch shall be contacted prior to entry and at completion of shift.

2. **Respiratory Protection Plan**

a) Submit a letter signed by the Contractor stating that all employees or agents required to wear a negative pressure or supplied air respirator have been medically evaluated in accordance with WAC 296-842.

b) Submit National Institute for Occupational Safety and Health (NIOSH) certification for all respiratory protective devices utilized on site, including a list of approved components (parts) for each type of respirator that may potentially be used on the project.

c) Submit a letter signed by the Contractor stating that respirator fit testing is current for all Contractor employees and agents who wear negative pressure or supplied air respirators. This fit testing shall be in accordance with quantitative procedures as detailed in WAC 296-842 and 296-62-07715.

d) Respiratory protection requirements for work impacting the following regulated materials (edit list below as necessary):

1) Asbestos (see Section 02 82 13)
2) Lead (see Section 02 83 19)
3) Light ballasts and universal waste lamps (see Section 02 84 16)
4) PCBs and PCB-containing materials (see Section 02 84 33)
5) PCB caulk (see Section 02 84 33.13)
6) Fugitive and silica dust (see Section 02 87 00)

3. **Steel Erection**: These requirements shall meet or exceed the guidelines of Chapter 296-155 WAC Part P, and shall include: pre-planning, hoisting operations, fall protection procedures, overhead protection and Site-Specific Erection Plan.

4. **Cranes**: Use of cranes or derricks and the testing and inspection thereof, including hooks, latches, wire rope, operator certification, boom stops, load charts, wind speed, warning devices, fire extinguishers, crane operation signals, suspended work platform pre-lift planning, and critical lift plans.

5. **Excavations**: Excavation plans must indicate sloping, documented daily inspections, shoring, barricading, excavation access, *fall protection*, and excavated material storage.

6. **Fall Protection**: How 100% protection will be maintained, identify the use of personal fall arrest equipment, fall protection systems, and fall protection work plans for heights 4-feet. NOTE: The *Monitor System is prohibited*.

7. **Formwork**: Submittal of formwork and false work drawings for review and approval to the Engineer.

8. **Hazard Communication Program**: Including SDS, their location, Master List of Chemicals, Personal Protective Equipment, Training, Labeling, and

SDS review and special procedures for sealers, coatings or specialty paints.

9. **Interruption of Fire/Security Systems**: Plans shall include measures and/or procedures to provide interim fire and security protection to facilities or areas affected by interruptions. These include automatic detection devices and alarms, automatic sprinkler systems, fire pumps, fire hydrants, applicable water supplies and reservoirs.

10. **Lock-out/Tag-out**: Procedures for lock-out/tag-out of energy sources during work operations. The Contractor shall include as part of the Lock-out/Tag-out program protocol for *Clearance Orders and Switching Orders* on electrical and mechanical systems.

11. **Scaffolding**: Red/Yellow/Green "Use" tag system, planking, guardrails, toe boards, anchor points, fall protection, access points, and inspections of.

12. **Fire Protection**: Including Hot Work Permits, Welding, shields, fire extinguishers, ventilation, PPE, fire watch and cylinder storage.

13. **Work Adjacent To Occupied Spaces**: Procedures for ensuring occupants of spaces adjoining, above and below construction areas will be protected from hazards created by construction, including but not limited to, falling debris, equipment noise, and penetration of partitions, ceilings, and floors.

14. **Competent Persons**: Where regulatory requirements (DOSH) specify the use of Competent Persons, the Contractor shall submit in writing the names of those persons. Their area of competency and applicable experience/training documentation.

15. **Energized Electrical Work Plan**: Submit detailed procedures for working on and guarding of energized equipment or conducting system outages.

16. **Seaport Safety**: Contractors shall submit a safety plan complying with all Federal, State, Corp of Engineers, Port of Seattle, and Coast Guard rules applicable to this type of construction.

17. **Health Considerations**: The Contractor shall submit a plan that addresses safety & health procedures for working in contact with contaminated soils. This plan shall be revised and resubmitted in the event that conditions encountered during the work are different than those initially planned for. It shall also include:

    a) Identification and evaluation of the hazards and risks associated with each work task.

    b) The names and qualifications of each contractor's representative(s) in charge of the work and present at the project when pipeline removal is performed.

    c) Identification of supervisory personnel and alternative responsibilities for site safety/response operations.

    d) Determine levels of personnel protection to be worn for various site operations.

e) List equipment with adequate nomenclature by item that will be used at the job site and the date and location where the Engineer can inspect this equipment.

f) Establishment of emergency procedures, such as: escape routes, fire protection, signals for withdrawing work parties from the site, emergency communications, wind indicators, including facility notification.

g) Identification and arrangements with the nearest medical facility for emergency medical care of both routine-type injuries and toxicological problems. Submit the name, location, and telephone number of this facility.

18. **Conveyor Safety Policy**: To include procedures for deactivation of conveyor systems, lockout/tagout of systems, working around operating conveyors and required Port of Seattle conveyor safety training.

19. **STS Tunnel Access Procedures**: What procedures employees will follow if work requires access into the STS system.

20. **Demolition**: The Contractor shall submit a plan to include how they will safely demolish existing structures, ensure security, safe guard employees and the public from falling material, electrical hazards and air quality issues. An Engineering Survey performed and signed by a Qualified Person shall be included.

21. **Public Protection Plan**: The actions the Contractor will take to protect the public while performing construction or demolition on the project. The plan shall include, but not be limited to, barricades, fencing, and signage. "Public" is defined as anyone not associated with the project - general public, POS and tenant employees.

For Port Construction Services small works contracts, include section C and the following 4-page worksheet. Airport Projects: Delete Appendix A item B.16. Seaport Projects: Delete Appendix A items B.18 & B.19.

C. SITE SPECIFIC SAFETY PLAN WORKSHEET

1. The following worksheet is to be used for Port Construction Services On Call Contracts for each work authorization. Once a safety submittal has been made and accepted for the On Call contract, Contractor will submit for each work authorization the following worksheet including support documentation referenced within the worksheet prior to beginning work.

Port of Seattle

JOB HAZARD ANALYSIS WORKSHEET

Site Specific Plan Addendum

				Person in Charge* for Reporting Hazards and Injuries:	
Location/address:				Phone Number:	
				* requires OSHA 10 & complete documented daily inspections	
Title of Job/Operation:		Date:		Day of Safety Meetings:	
		Work Order #:		Emergency action plan	Call Fire Dept 787-5380 on airport grounds. 911 everywhere else. For large scale emergency meet at:
Analysis Made By:		Contact person:			
Analysis Reviewed By:		Phone Number:			
Location of Master Prevention Program:					

Sequence of Basic Job Steps	Potential Hazards/Ergonomics	Recommended Safe Job Procedures and Required PPE

Supervisor Signature:		Received by RE/CM:	

Will the Scope of Work consist of the following tasks? (check all that apply)			
	Traffic control*		Confined Space Entry*
	Welding, Cutting, Grinding*		Heavy Equipment
	Trenching or Excavation*		Flammable or Combustible materials[(a)]
	Carpentry		Steel Erection*
	Painting, Staining, Sealant*[(a)]		Ladder or Scaffold work
	Demolition (Structural)*		Roofing
	Energized Electrical*		Regulated Materials
	Use of a Crane/Boom/Hoisting device*		Hazardous Materials
	Work from heights of 6′ or greater*		Conveyors*

* Requires additional paperwork – checklists, plans, permits, shut-down notice, etc.

[(a)]List Chemicals to be used on the project.
Material Safety Data Sheets attached ☐ Yes ☐ No *Physical MSDS must be on-site.

(*) A ***Chemical Exposure Plan*** will be required for products containing isocyanates, methylene chloride, Hydroflouric Acid, lead, silica and processes involving floor sealers, traffic coatings, terrazzo sealers or specialty paints.

Description of public protection measures ("Public" is defined as anyone not associated with the project - general public, POS, Tenant, and Airline Employees):

Employee Disciplinary for non-compliance with set forth safety policies and procedures will be consistent Port of Seattle's disciplinary action matrix as described within your site-specific safety plan and site-specific orientation.

Sign Up			
Print Name	**Signature**	**Print Name**	**Signature**

APPENDIX B

CONTRACTOR CONFINED SPACE ENTRY PROGRAM CERTIFICATE

I hereby certify that the attached Confined Space Entry Program meets or exceeds the requirements of DOSH standards WAC 296-809 and the Port Of Seattle's Confined Space Entry Program.

My employees will utilize the Port of Seattle (POS) confined space entry permit(s). They will complete all other sections of the permit that are appropriate for the confined space being entered.

My employees will be informed that they must coordinate their confined space entry procedures with other Contractors and POS employees working in or around the confined space. On Airport projects, if entering into a Permit Required Confined Space, we will first contact the Port of Seattle Fire Department, notifying them of the specific location and activity to be performed.

My employees, who will be acting as authorized entrants, attendants, entry supervisors, and air testers, have been trained in accordance with the DOSH procedures and will be made aware of all of the POS procedures for entering confined spaces.

After the confined space entry project is complete my employees will make the Engineer and Construction Safety aware of any new hazards confronted or created during entry operations. On Airport projects, my employees will contact the Port of Seattle Fire Department and advise them that operations have ceased.

A copy of finalized permit with all attachments will be provided to the Engineer at the end of each project.

Contractor's Name: _____

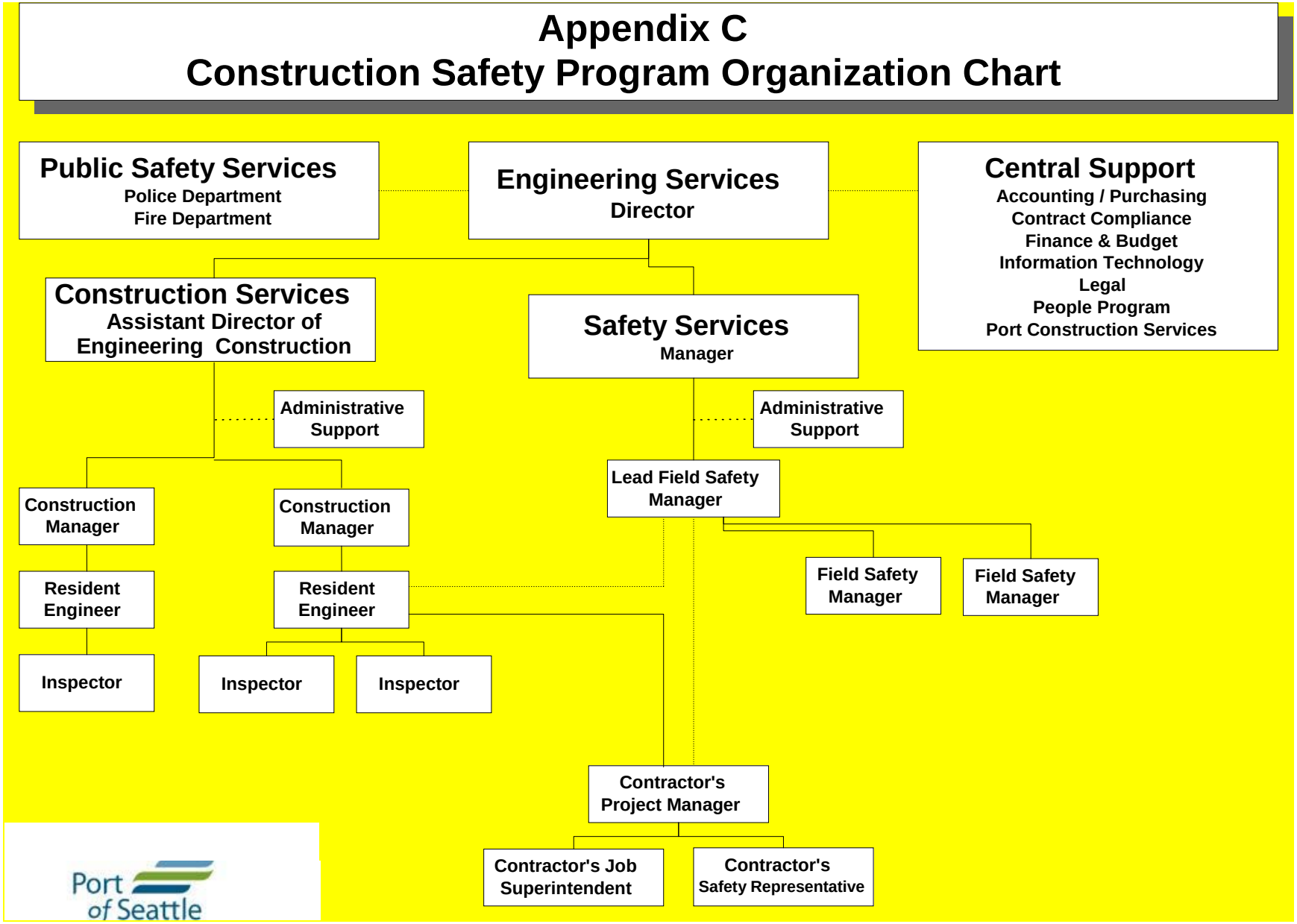
Contractor's Signature: _____

Company Name: _____ Date: _____

Port of Seattle Resident Engineer: _____

Date: _____

Appendix C
Construction Safety Program Organization Chart



APPENDIX D

Port of Seattle

CSIR [Construction Safety Inspection Report]

CSIR DATE	Click here to enter a date.
CONTRACTOR NAME	
PROJECT NUMBER	
PROJECT TITLE	
ACCOMPANIED BY	

SECTION ONE: To be completed by Port of Seattle, Construction Safety Management

CSIR PREPARED BY	
TITLE	
DATE	Click here to enter a date.

ITEM NUMBER	SAFETY OBSERVATION	REFERENCE
001		
002		
003		
004		

SECTION TWO: To be completed by the Contractor Project Manager, except gray column

NOTE: All corrective actions shall be implemented within 48-hours, and the signed report returned immediately or within 5 working

PROJECT MANAGER OR DESIGNEE TYPE NAME TO ACKNOWLEDGE RECEIPT	
DATE	Click here to enter a date.

ITEM NUMBER (FROM ABOVE)	CONTRACTOR'S CORRECTIVE ACTION TAKEN	DATE ITEM CORRECTED	POS INSPECTOR (POS USE ONLY)	FINAL SAFETY REVIEW (POS USE ONLY)
001		Click here to enter a date.		Choose an item.
002		Click here to enter a date.		Choose an item.
003		Click here to enter a date.		Choose an item.
004		Click here to enter a date.		Choose an item.

Port of Seattle

CSIR [Construction Safety Inspection Report]

SECTION THREE: To be completed by Port of Seattle, Construction Safety Management	
CSIR PREPARED BY	
TITLE	
DATE	Click here to enter a date.

ITEM NUMBER	FINAL SAFETY REVIEW COMMENTS
001	
002	
003	
004	

See pages 284-341

U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: Operational Safety on Airports During Construction	**Date:** 9/29/11 **Initiated by:** AAS-100	**AC No:** 150/5370-2F

1. Purpose. This AC sets forth guidelines for operational safety on airports during construction.

2. What this AC Cancels. This AC cancels AC 150/5370-2E, Operational Safety on Airports During Construction, dated January 17, 2003.

3. Whom This AC Affects. This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, Certification of Airports (Part 139). For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications." While we do not require non-certificated airports without grant agreements to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

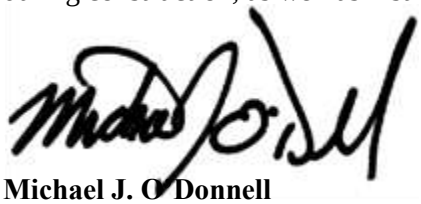
4. Principal Changes.

a. Construction activities are prohibited in safety areas while the associated runway or taxiway is open to aircraft.

b. Guidance is provided in incorporating Safety Risk Management.

c. Recommended checklists are provided for writing Construction Safety and Phasing Plans and for daily inspections.

5. Reading Material Related to this AC. Numerous ACs are referenced in the text of this AC. These references do not include a revision letter, as they are to be read as referring to the latest version. Appendix 1 contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.



Michael J. O'Donnell
Director of Airport Safety and Standards

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Table of Contents

List of Tables

List of Figures

Chapter 1. Planning an Airfield Construction Project

101. Overview. Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, some of the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

102. Plan for Safety. Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified. As they are identified, their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations in order to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

a. Identify Affected Areas. The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

b. Describe Current Operations. Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Reference Code (ACRC) for each runway; Airplane Design Group (ADG) and Taxiway Design Group (TDG)[1] for each affected taxiway; designated approach visibility minimums; available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

c. Allow for Temporary Changes to Operations. To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways,

[1] Taxiway Design Group will be introduced in AC 150/5300-13A.

and other changes. An example of a table showing temporary operations versus current operations is shown in Table 3-1 Sample Operations Effects.

d. Take Required Measures to Revised Operations. Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary so widely among airports, this AC presents general guidance on those subjects.

e. Manage Safety Risk. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA to determine the appropriate level of Safety Risk Management (SRM) documentation. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for SRM documentation. See FAA Order 5200.11, FAA Airports (ARP) Safety Management System (SMS), for more information. If the FAA requires SRM documentation, the airport operator must at a minimum:

(1) Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.

(2) Provide documents identified by the FAA as necessary to conduct SRM.

(3) Participate in the SRM process for airport projects.

(4) Provide a representative to participate on the SRM panel.

(5) Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

103. Develop a Construction Safety and Phasing Plan (CSPP). Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix 1, Related Reading Material for a list of related reading material.

a. List Requirements. A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) program or located on an airport certificated under Part 139. As per Order 5200.11, such projects do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 102.e above). Additional information may be found in Order 5200.11.

b. Prepare a Safety Plan Compliance Document. The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

c. Assume Responsibility for the CSPP. The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

104. Who Is Responsible for Safety During Construction?

a. Establish a Safety Culture. Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others. Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

b. Assess Airport Operator's Responsibilities. An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

(1) Develop a CSPP that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.

(2) Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.

(3) Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5300-9, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects.* (Note "FAA" refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)

(4) Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.

(5) Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.

(6) Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.

(7) Ensure construction personnel know of any applicable airport procedures and of changes to those procedures that may affect their work.

(8) Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.

(9) Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.

(10) At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

(11) Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

(12) Resolve safety deficiencies immediately. At airports subject to 49 CFR Part 1542, Airport Security, ensure construction access complies with the security requirements of that regulation.

(13) Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).

(14) Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other.), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.

(15) Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. Coordinate with appropriate local and other federal government agencies, such as EPA, OSHA, TSA, and the state environmental agency.

c. Define Construction Contractor's Responsibilities. The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

(1) Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supplying any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor that indicates it understands the operational safety requirements of the CSPP and it asserts it will not deviate from the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.

(2) Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

(3) Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.

(4) Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site whenever active construction is taking place.

(5) Conduct inspections sufficiently frequently to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

(6) Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate and as specified in the CSPP and SPCD.

(7) Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.

(8) Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency.

d. Define Tenant's Responsibilities if planning construction activities on leased property. Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction must:

(1) Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator for certification and subsequent approval by the FAA. The approved CSPP must be made part of any contract awarded by the tenant for construction work.

(2) In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval to be issued prior to issuance of a Notice to Proceed.

(3) Ensure that construction personnel are familiar with safety procedures and regulations on the airport.

(4) Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.

(5) Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site whenever active construction is taking place.

(6) Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.

(7) Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.

(8) Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other.), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency.

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Chapter 2. Construction Safety and Phasing Plans

Section 1. Basic Considerations

201. Overview. Aviation safety is the primary consideration at airports, especially during construction. The airport operator's Construction Safety and Phasing Plan (CSPP) and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide all information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

202. Assume Responsibility. Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

203. Submit the CSPP. Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5 x 11 in or 11 x 17 in format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

a. Submit an Outline/Draft. By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

b. Submit a Construction Safety and Phasing Plan (CSPP). The CSPP should be formally submitted for FAA approval when the project design is 80% to 90% complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

c. Submit a Safety Plan Compliance Document (SPCD). The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

d. Submit CSPP Revisions. All revisions to the CSPP or SPCD should be submitted to the FAA for approval as soon as required changes are identified.

204. Meet CSPP Requirements.

a. To the extent possible, the CSPP should address the following as outlined in Section 2, Plan Requirements and Chapter 3, Guidelines for Writing a CSPP, as appropriate. Details that cannot be determined at this stage are to be included in the SPCD.

(1) Coordination.

(a) Contractor progress meetings.

(b) Scope or schedule changes.

(c) FAA ATO coordination.

(2) Phasing.

(a) Phase elements.

(b) Construction safety drawings

(3) Areas and operations affected by the construction activity.

(a) Identification of affected areas.

(b) Mitigation of effects.

(4) Protection of navigation aids (NAVAIDs).

(5) Contractor access.

(a) Location of stockpiled construction materials.

(b) Vehicle and pedestrian operations.

(6) Wildlife management.

(a) Trash.

(b) Standing water.

(c) Tall grass and seeds.

(d) Poorly maintained fencing and gates.

(e) Disruption of existing wildlife habitat.

(7) Foreign Object Debris (FOD) management.

(8) Hazardous materials (HAZMAT) management

(9) Notification of construction activities.

(a) Maintenance of a list of responsible representatives/ points of contact.

(b) Notices to Airmen (NOTAM).

(c) Emergency notification procedures.

(d) Coordination with ARFF Personnel.

(e) Notification to the FAA.

(10) Inspection requirements.

(a) Daily (or more frequent) inspections.

(b) Final inspections.

(11) Underground utilities.

(12) Penalties.

(13) Special conditions.

(14) Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.

(a) General.

(b) Markings.

(c) Lighting and visual NAVAIDs.

(d) Signs.

(15) Marking and signs for access routes.

(16) Hazard marking and lighting.

(a) Purpose.

(b) Equipment.

(17) Protection. Of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces

(a) Runway Safety Area (RSA).

(b) Runway Object Free Area (ROFA).

(c) Taxiway Safety Area (TSA).

(d) Taxiway Object Free Area (TOFA).

(e) Obstacle Free Zone (OFZ).

(f) Runway approach/departure surfaces.

(18) Other limitations on construction.

(a) Prohibitions.

(b) Restrictions.

b. The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I , Name of Contractor , have read the Title of Project CSPP, approved on Date , and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

(1) Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.

(2) Phasing. Discuss proposed construction schedule elements, including:

(a) Duration of each phase.

(b) Daily start and finish of construction, including "night only" construction.

(c) Duration of construction activities during:

(i) Normal runway operations.

(ii) Closed runway operations.

(iii) Modified runway "Aircraft Reference Code" usage.

(3) Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.

(4) Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.

(5) Contractor access. Provide the following:

(a) Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).

(b) Listing of individuals requiring driver training (for certificated airports and as requested).

(c) Radio communications.

(i) Types of radios and backup capabilities.

(ii) Who will be monitoring radios.

(iii) Whom to contact if the ATCT cannot reach the contractor's designated person by radio.

(d) Details on how the contractor will escort material delivery vehicles.

(6) Wildlife management. Discuss the following:

(a) Methods and procedures to prevent wildlife attraction.

(b) Wildlife reporting procedures.

(7) Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.

(8) Hazardous material (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.

(9) Notification of construction activities. Provide the following:

(a) Contractor points of contact.

(b) Contractor emergency contact.

(c) Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.

(d) Batch plant details, including 7460-1 submittal.

(10) Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.

(11) Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.

(12) Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.

(13) Special conditions. Discuss proposed actions for each special condition identified in the CSPP.

(14) Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:

(a) Equipment and methods for covering signage and airfield lights.

(b) Equipment and methods for temporary closure markings (paint, fabric, other).

(c) Types of temporary Visual Guidance Slope Indicators (VGSI).

(15) Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.

(16) Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.

(17) Protection of runway and taxiway safety areas. including object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:

(a) Equipment and methods for maintaining Taxiway Safety Area standards.

(b) Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.

(18) Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

Section 2. Plan Requirements

205. Coordination. Airport operators, or tenants conducting construction on their leased properties, should use predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction (see AC 150/5300-9). In addition, the following should be coordinated as required:

a. Contractor Progress Meetings. Operational safety should be a standing agenda item for discussion during progress meetings throughout the project.

b. Scope or Schedule Changes. Changes in the scope or duration of the project may necessitate revisions to the CSPP and review and approval by the airport operator and the FAA.

c. FAA ATO Coordination. Early coordination with FAA ATO is required to schedule airway facility shutdowns and restarts. Relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See 213.e(3)(b) for required FAA notification regarding FAA owned NAVAIDs.)

206. Phasing. Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In such a case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

a. Phase Elements. For each phase the CSPP should detail:

- Areas closed to aircraft operations

- Duration of closures
- Taxi routes
- ARFF access routes
- Construction staging areas
- Construction access and haul routes
- Impacts to NAVAIDs
- Lighting and marking changes
- Available runway length
- Declared distances (if applicable)
- Required hazard marking and lighting
- Lead times for required notifications

b. Construction Safety Drawings. Drawings specifically indicating operational safety procedures and methods in affected areas (that is, construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should likewise be included in the contract drawing package.

207. Areas and Operations Affected by Construction Activity. Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA Air Traffic Organization (ATO) will support operational simulations. See Chapter 3 for an example of a table showing temporary operations versus current operations.

a. Identification of Affected Areas. Identifying areas and operations affected by the construction will help to determine possible safety problems. The affected areas should be indentified in the construction safety drawings for each construction phase. (See 206.b above.) Of particular concern are:

(1) Closing, or partial closing, of runways, taxiways and aprons. When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or taking off in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is available for take-off in the direction of the displacement and for landing and taking off in the opposite direction. Misunderstanding this difference, and issuance of a subsequently inaccurate NOTAM, can lead to a hazardous condition.

(2) Closing of Aircraft Rescue and Fire Fighting access routes.

(3) Closing of access routes used by airport and airline support vehicles.

(4) Interruption of utilities, including water supplies for fire fighting.

(5) Approach/departure surfaces affected by heights of objects.

(6) Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.

b. Mitigation of Effects. Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

(1) Temporary changes to runway and/or taxi operations.

(2) Detours for ARFF and other airport vehicles.

(3) Maintenance of essential utilities.

(4) Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

208. Navigation Aid (NAVAID) Protection. Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 213.e(3) below.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the "critical area" associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 213.b below). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 213.e(1) below.)

209. Contractor Access. The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

a. Location of Stockpiled Construction Materials. Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 218.b below.) This includes determining and verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage. See paragraphs 210 and 211 below.

b. Vehicle and Pedestrian Operations. The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, and detail associated training requirements:

(1) Construction site parking. Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

(2) Construction equipment parking. Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by

construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 213.e(1) below for further information.

(3) Access and haul roads. Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul roads does not interfere with NAVAIDs or approach surfaces of operational runways.

(4) Marking and lighting of vehicles in accordance with AC 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport.

(5) Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.

(6) Required escorts.

(7) Training requirements for vehicle drivers to ensure compliance with the airport operator's vehicle rules and regulations. Specific training should be provided to those vehicle operators providing escorts. See AC 150/5210-20, Ground Vehicle Operations on Airports, for information on training and records maintenance requirements.

(8) Situational awareness. Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time.

(9) Two-way radio communication procedures.

(a) General. The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

(i) Airport operations

(ii) ATCT

(iii) Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.

(iv) Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and "shortened" runways on the ATIS frequency.

(b) Areas requiring two-way radio communication with the ATCT. Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

(c) Frequencies to be used. The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

(d) Proper radio usage, including read back requirements.

(e) Proper phraseology, including the International Phonetic Alphabet.

(f) Light gun signals. Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings." This safety placard may be downloaded through the Runway Safety Program Web site at http://www.faa.gov/airports/runway_safety/publications/ (See "Signs & Markings Vehicle Dashboard Sticker".) or obtained from the FAA Airports Regional Office.

(10) Maintenance of the secured area of the airport, including:

(a) Fencing and gates. Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-00/52, Recommended Security Guidelines for Airport Planning and Construction, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

(b) Badging requirements.

(c) Airports subject to 49 CFR Part 1542, Airport Security, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

210. Wildlife Management. The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See also AC 150/5200-33, Hazardous Wildlife Attractants On or Near Airports, and Certalert 98-05, Grasses Attractive to Hazardous Wildlife. Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

a. Trash. Food scraps must be collected from construction personnel activity.

b. Standing Water.

c. Tall Grass and Seeds. Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, Standards for Specifying Construction of Airports, Item T-901, Seeding. Contact the local office of the United Sates Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

d. Poorly Maintained Fencing and Gates. See 209.b(10)(a) above.

e. Disruption of Existing Wildlife Habitat. While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

211. Foreign Object Debris (FOD) Management. Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, Foreign Object Debris (FOD) Management.

212. Hazardous Materials (HAZMAT) Management. Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, Management of Airport Industrial Waste.

213. Notification of Construction Activities. The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

a. List of Responsible Representatives/ points of contact for all involved parties, and procedures for contacting each of them, including after hours.

b. NOTAMs. Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, Notices to Airmen (NOTAMs) for Airport Operators, for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 207.a(1) above regarding issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

c. Emergency notification procedures for medical, fire fighting, and police response.

d. Coordination with ARFF. The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

- The deactivation and subsequent reactivation of water lines or fire hydrants, or
- The rerouting, blocking and restoration of emergency access routes, or
- The use of hazardous materials on the airfield.

e. Notification to the FAA.

(1) Part 77. Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed

parking areas for this equipment (i.e. cranes, graders, other equipment) on airports. FAA Form 7460-1, Notice of Proposed Construction or Alteration, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix 1, Related Reading Material, to download the form. Further guidance is available on the FAA web site at oeaaa.faa.gov.

(2) Part 157. With some exceptions, Title 14 CFR Part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the nearest FAA Airports Regional or District Office. See Appendix 1, Related Reading Material to download the form.

(3) NAVAIDS. For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

(a) Airport owned/FAA maintained. If construction operations require a shutdown of more than 24 hours, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown.

(b) FAA owned.

(i) General. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs. (Impacts to FAA equipment covered by a Reimbursable Agreement (RA) do not have to be reported by the airport operator.)

(ii) Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. In addition, provide seven days notice to schedule the actual shutdown.

214. Inspection Requirements.

a. Daily Inspections. Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix 3, Safety and Phasing Plan Checklist. See also AC 150/5200-18, Airport Safety Self-Inspection.

b. Final Inspections. New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

215. Underground Utilities. The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that “One Call” or “Miss Utility” services do not include FAA ATO/Technical Operations

216. Penalties. The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

217. Special Conditions. The CSPP must detail any special conditions that affect the operation of the

airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

218. Runway and Taxiway Visual Aids. Includes marking, lighting, signs, and visual NAVAIDS. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs remain in place and operational. The CSPP must address the following, as appropriate:

a. General. Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

b. Markings. Markings must be in compliance with the standards of AC 150/5340-1, Standards for Airport Markings. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 218.b(1)(b) below.)

(1) Closed Runways and Taxiways.

(a) Permanently Closed Runways. For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place Xs at each end and at 1,000-foot (300 m) intervals.

(b) Temporarily Closed Runways. For runways that have been temporarily closed, place an X at the each end of the runway directly on or as near as practicable to the runway designation numbers. Figure 2-1 illustrates.

Figure 2-1 Markings for a Temporarily Closed Runway

(c) Partially Closed Runways and Displaced Thresholds. When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 207.a(1) above for the difference between partially closed runways and runways with displaced thresholds.

(i) Partially Closed Runways. Pavement markings for temporary closed portions of the runway consist of a runway threshold bar and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see AC 150/5340-1).

(ii) Displaced Thresholds. Pavement markings for a displaced threshold consist of a runway threshold bar and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See AC 150/5340-1.

(d) Taxiways.

(i) Permanently Closed Taxiways. AC 150/5300-13 notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. Figure 2-2 illustrates.

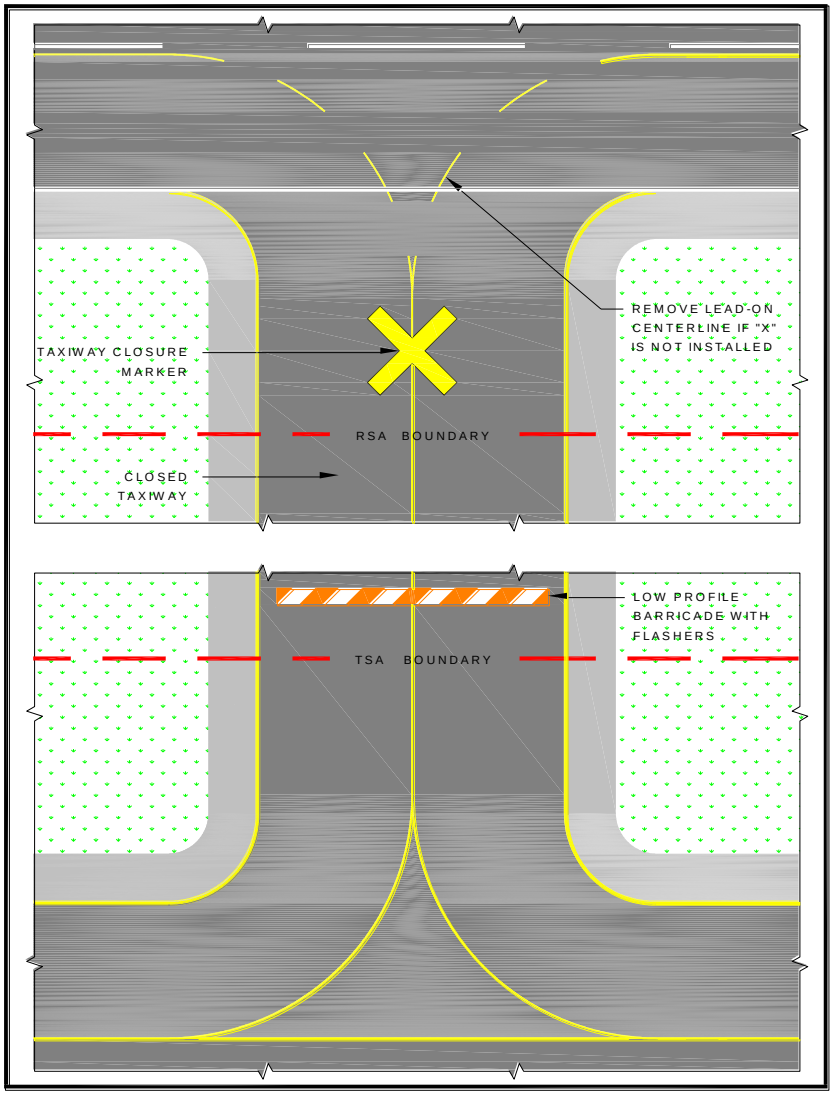

Figure 2-2 Taxiway Closure

(ii) Temporarily Closed Taxiways. Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed section. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed.

(e) Temporarily Closed Airport. When the airport is closed temporarily, mark all the runways as closed.

(2) If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents.

(3) It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

(4) If it is not possible to install threshold bars, chevrons, and arrows on the pavement, temporary outboard markings may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimension along the runway direction must be the same as if installed on the pavement. The lateral dimension must be at least one-half that of on-pavement markings. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

(5) The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in AC 150/5370-10), but the dimensions must meet the existing standards.

c. Lighting and Visual NAVAIDs. This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting must be in conformance with AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and AC 150/5345-50, Specification for Portable Runway and Taxiway Lights. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources.

(1) Permanently Closed Runways and Taxiways. For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

(2) Temporarily Closed Runways. If available, use a lighted X, both at night and during the day, placed at each end of the runway facing the approach. The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure. For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-3 shows a lighted X by day. Figure 2-4 shows a lighted X at night.

Figure 2-3 Lighted X in Daytime

Figure 2-4 Lighted X at Night

(3) Partially Closed Runways and Displaced Thresholds. When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or

taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service

(a) Partially Closed Runways. Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixture in such a way as to prevent light leakage.

(b) Displaced Thresholds. Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light in the opposite direction. Centerline lights are blanked out in the direction of approach if the displacement is 700 ft or less. If the displacement is over 700 ft, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds.

(c) Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

(d) A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 218.b(1)(c) above. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, Specification for L-853, Runway and Taxiway Retroreflective Markers.

(e) Temporary threshold lights and end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 in (7.6 cm) above ground. When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

(f) Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

(g) Reconfigure yellow lenses (caution zone), as necessary. If the runway has centerline lights, reconfigure the red lenses, as necessary, or place the centerline lights out of service.

(h) Relocate the visual glide slope indicator (VGSI), such as VASI and PAPI; other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense.

(i) Issue a NOTAM to inform pilots of temporary lighting conditions.

(4) Temporarily Closed Taxiways. If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open),

cover the light fixture in such a way as to prevent light leakage.

d. Signs. To the extent possible, signs must be in conformance with AC 150/5345-44, Specification for Runway and Taxiway Signs and AC 150/5340-18, Standard for Airport Sign Systems. Any time a sign does not serve its normal function; it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

219. Marking and Signs for Access Routes. The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, Frangible Connections, which may require modification to size and height guidance in the MUTCD.

220. Hazard Marking, Lighting and Signing.

a. Hazard Marking and Lighting Prevents Pilots from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

b. Equipment.

(1) Barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 ft. Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

(2) Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 ft. Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

(3) Supplement barricades with signs (for example “No Entry,” “No Vehicles”) as necessary.

(4) Air Operations Area – General. Barricades are not permitted in any active safety area. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, collapsible barricades marked with diagonal, alternating orange and

white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 in (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 in high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 in (7.6 cm) above the ground. Figure 2-5 and Figure 2-6 show sample barricades with proper coloring and flags.

Figure 2-5 Interlocking Barricades

Figure 2-6 Low Profile Barricades

(5) Air Operations Area – Runway/Taxiway Intersections. Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

(6) Air Operations Area – Other. Beyond runway and taxiway object free areas and

aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

(7) Maintenance. The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

221. Protection of Runway and Taxiway Safety Areas. Runway and taxiway safety areas, Obstacle Free zones (OFZ), object free areas (OFA), and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (See paragraph 213.e above.) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

a. Runway Safety Area (RSA). A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

(1) No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (see AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published. See AC 150/5300-13 for guidance on the use of declared distances.

(2) The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

(3) The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

(4) Excavations.

(a) Open trenches or excavations are not permitted within the RSA while the runway is open. If possible, backfill trenches before the runway is opened. If the runway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

(b) Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

(5) Erosion Control. Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

b. Runway Object Free Area (ROFA). Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

c. Taxiway Safety Area (TSA). A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Construction activities within the TSA are subject to the following conditions:

(1) No construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction (see AC 150/5300-13, Table 4-1).

(2) The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

(3) The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

(4) Excavations.

(a) Open trenches or excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.

(b) Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

(5) Erosion Control. Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

d. Taxiway Object Free Area (TOFA). Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

(1) The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available.

(2) Offset taxiway pavement markings may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting or reflectors are required.

(3) Construction activity may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:

(a) Appropriate NOTAMs are issued.

(b) Marking and lighting meeting the provisions of paragraphs 218 and 220 above are implemented.

(c) Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). In these situations, flaggers must be used to direct construction equipment, and wing walkers will be necessary to guide aircraft. Wing walkers should be airline/aviation personnel rather than construction workers. If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.

e. Obstacle Free Zone (OFZ). In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

f. Runway Approach/Departure Areas and Clearways. All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in Appendix 2, "Threshold Siting Requirements," of AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

(1) Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

(2) Caution regarding partial runway closures. When filing a NOTAM for a partial runway closure, clearly state to OCC personnel that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

(3) Caution regarding displaced thresholds. : Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, other work. within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

222. Other Limitations on Construction. The CSPP must specify any other limitations on construction, including but not limited to:

a. Prohibitions.

(1) No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.

(2) No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.

(3) No use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.

See AC 150/5370-10.

(4) No use of flare pots within the AOA.

b. Restrictions.

(1) Construction suspension required during specific airport operations.

(2) Areas that cannot be worked on simultaneously.

(3) Day or night construction restrictions.

(4) Seasonal construction restrictions.

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Chapter 3. Guidelines for Writing a CSPP

301. General Requirements. The CSPP is a standalone document written to correspond with the subjects outlined in Chapter 2, Section 1, paragraph 204. The CSPP is organized by numbered sections corresponding to each subject listed in Chapter 2, Section 1, paragraph 204, and described in detail in Chapter 2, Section 2. Each section number and title in the CSPP matches the corresponding subject outlined in Chapter 2, paragraph 204 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on.). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

302. Applicability of Subjects. Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA Instrument Landing System (ILS) cables during trenching operations could be considered FAA ATO coordination (Section 1. Coordination, paragraph 205.c), an area and operation affected by the construction activity (Section 3. Areas and Operations Affected by the Construction Activity, paragraph 207.a(4)), a protection of a NAVAID (Section 4. Protection of Navigational Aids (NAVAIDs),paragraph 208), or a notification to the FAA of construction activities (Section 9. Notification of Construction Activities, paragraph 210.e(3)(b)). However, it is more specifically an underground utility requirement (Section 11. Underground Utilities, paragraph 215). The procedure for protecting underground ILS cables during trenching operations should therefore be described in Section 11: "*The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings.*" All other applicable sections should include a reference to Section 11: "*ILS cables shall be identified and protected as described in Section 11*" or "*See Section 11 for ILS cable identification and protection requirements.*" Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

303. Graphical Representations. Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

304. Reference Documents. The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor.

305. Restrictions. The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent ("as-built") features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

306. Coordination. Include in this section a detailed description of conferences and meetings both before and during the project. Include appropriate information from AC 150/5300-9. Discuss coordination procedures and schedules for each required FAA ATO airway facility shutdown and restart and all required flight inspections.

307. Phasing. Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 308 below, as appropriate.

308. Areas and Operations Affected By Construction. Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. Tables and charts such as the following may be helpful in highlighting issues to be addressed.

Table 3-1 Sample Operations Effects

Project	Runway 15-33 Reconstruction	
Phase	Phase II: Reconstruct Runway 15 End	
Scope of Work	Reconstruct 1,000 ft of north end of Runway 15-33 with Portland Cement Concrete (PCC).	
Operational Requirements	**Normal (Existing)**	**Phase II (Anticipated)**
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 52 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 ARC	C-IV	C-IV
Runway 15 Approach Visibility Minimums	¾ mile	1 mile
Runway 33 Approach Visibility Minimums	¾ mile	1 mile
Runway 15 Declared Distances	TORA: 7,820	TORA: 6,420
	TODA: 7,820	TODA: 6,420
	ASDA: 7,820	ASDA: 6,420
	LDA: 7,820	LDA: 6,420
Runway 33 Declared Distances	TORA: 8,320	TORA: 6,920
	TODA: 8,320	TODA: 6,920
	ASDA: 8,320	ASDA: 6,920
	LDA: 7,820	LDA: 6,420
Runway 15 Approach Procedures	ILS	LOC only
	RNAV	N/A
	VOR	N/A
Runway 33 Approach Procedures	ILS	Visual only
	RNAV	N/A
	VOR	N/A
Runway 15 NAVAIDs	ILS/DME, MALSR, RVR	LOC/DME, PAPI (temp), RVR

Runway 33 NAVAIDs	ILS/DME, MALSF, PAPI, RVR	MALSF, PAPI, RVR
Taxiway G ADG	IV	IV (N/A between T/W H and R/W 15 end)
Taxiway E ADG	IV	IV
ATCT (hours open)	06:00 – 24:00 local	06:00 – 24:00 local
ARFF Index	D	D
Special Conditions	Air National Guard (ANG) military operations	Military operations relocated to alternate ANG Base
	Airline XYZ requires VGSI	Airline XYZ requires VGSI

Complete the following chart for each phase to determine the area that must be protected along the runway edges:

Runway	**Aircraft Approach Category* A, B, C, or D**	**Airplane Design Group* I, II, III, or IV**	**RSA Width in Feet Divided by 2***
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
*See AC 150/5300-13 to complete the chart for a specific runway.			

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Runway End Number	**Airplane Design Group* I, II, III, or IV**	**Aircraft Approach Category* A, B, C, or D**	**Minimum Safety Area Prior to the Threshold***	**Minimum Distance to Threshold Based on Required Approach Slope***	
_____	_____	_____	_____ ft	_____ ft	_____: 1
_____	_____	_____	_____ ft	_____ ft	_____: 1
_____	_____	_____	_____ ft	_____ ft	_____: 1
_____	_____	_____	_____ ft	_____ ft	_____: 1
*See AC 150/5300-13 to complete the chart for a specific runway.					

309. Navigation Aid (NAVAID) Protection. List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 306 above for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 314 for the issuance of NOTAMs as required. Include a reference to paragraph 316 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 319. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

310. Contractor Access. This will necessarily be the most extensive section of the CSPP. Provide

sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

a. Location of Stockpiled Construction Materials. Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 321 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 311 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 312 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

b. Vehicle and Pedestrian Operations. While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying Hazardous Material (HAZMAT) vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

c. Two-Way Radio Communications. Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor Common Traffic Advisory Frequencies (CTAF) at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light signals, telephone numbers, others) must be included. All radio frequencies should by identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

d. Airport Security. Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

311. Wildlife Management. Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 310 for security (wildlife) fence integrity maintenance as required.

312. Foreign Object Debris (FOD) Management. In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 315 for inspection requirements as required.

313. Hazardous Materials (HAZMAT) Management. Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Material Safety Data Sheet (MSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be

identified. Include a reference to paragraph 310 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

314. Notification of Construction Activities. List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 310. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

315. Inspection Requirements. Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

316. Underground Utilities. Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 314 above for notification of utility owners of accidental utility disruption as required.

317. Penalties. Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, Vehicle/Pedestrian Deviations (VPD), and others.

318. Special Conditions. Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 310 above for compliance with airport safety and security measures and for radio communications as required. Include a reference to paragraph 319 below for emergency notification of all involved parties, including police/security, ARFF, and medical services.

319. Runway and Taxiway Visual Aids. Include marking, lighting, signs, and visual NAVAIDS.

Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDs required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDs that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDs such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, Standards for Airport Markings, AC 150/5340-18, Standards for Airport Sign Systems, and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDs.

320. Marking and Signs for Access Routes. Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

321. Hazard Marking and Lighting. Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 314 above. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

322. Protection of Runway and Taxiway Safety Areas. This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13: Airport Design as required. Include a reference to paragraph 310 above for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 310 above for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 321 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide adequate Runway Safety Area, include a reference to paragraphs 314 and 319 above. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13: Airport Design as required. Include a reference to paragraph 323 for height (i.e. crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional “box” within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

323. Other Limitations on Construction. This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e. crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 307 above for project phasing requirements based on construction limitations as required.

Appendix 1. Related Reading Material

Obtain the latest version of the following free publications from the FAA on its Web site at http://www.faa.gov/airports/.

AC	Title and Description
AC 150/5200-28	Notices to Airmen (NOTAMs) for Airport Operators
	Guidance for using the NOTAM System in airport reporting.
AC 150/5200-30	Airport Winter Safety and Operations
	Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
AC 150/5200-33	Hazardous Wildlife Attractants On or Near Airports
	Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports.
AC 150/5210-5	Painting, Marking, and Lighting of Vehicles Used on an Airport.
	Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
AC 150/5210-20	Ground Vehicle Operations on Airports
	Guidance to airport operators on developing ground vehicle operation training programs.
AC 150/5300-13	Airport Design
	FAA standards and recommendations for airport design, establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria.
AC 150/5310-24	Airport Foreign Object Debris Management
	Guidance for developing and managing an airport foreign object debris (FOD) program
AC 150/5220-4	Water Supply Systems for Aircraft Fire and Rescue Protection.
	Guidance on selecting a water source and meeting standards for a distribution system to support aircraft rescue and fire fighting service operations on airports.
AC 150/5320-15	Management of Airport Industrial Waste
	Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities.
AC 150/5340-1	Standards for Airport Markings
	FAA standards for markings used on airport runways, taxiways, and aprons.
AC 150/5340-18	Standards for Airport Sign Systems
	FAA standards for the siting and installation of signs on airport runways and taxiways.
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
	FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.

AC	Title and Description
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
	Guidance and recommendations on the installation of airport visual aids.
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-44	Specification for Runway and Taxiway Signs
	FAA specifications for unlighted and lighted signs for taxiways and runways.
AC 150/5345-53	Airport Lighting Certification Program
	Details on the Airport Lighting Equipment Certification Program (ALECP).
AC 150/5345-50	Specification for Portable Runway and Taxiway Lights
	FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative.
AC 150/5345-55	Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure
AC 150/5370-10	Standards for Specifying Construction of Airports
	Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
FAA Order 5200.11	FAA Airports (ARP) Safety Management System (SMS)
	Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS.
FAA Certalert 98-05	Grasses Attractive to Hazardous Wildlife
	Guidance on grass management and seed selection.
FAA Form 7460-1	Notice of Proposed Construction or Alteration
FAA Form 7480-1	Notice of Landing Area Proposal

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at http://ecfr.gpoaccess.gov/.

Title 14 CFR Part 139	Certification of Airports
Title 49 CFR Part 1542	Airport Security

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at http://mutcd.fhwa.dot.gov/.

Appendix 2. Definition of Terms

Term	Definition
7460-1	Notice Of Proposed Construction Or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, safe, efficient use, and preservation of the navigable airspace. (See guidance available on the FAA web site at oeaaa.faa.gov.) The form may be downloaded at http://www.faa.gov/airports/resources/forms/, or filed electronically at: https://oeaaa.faa.gov.
7480-1	Notice Of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport The form may be downloaded at http://www.faa.gov/airports/resources/forms/.
AC	Advisory Circular
ACRC	Aircraft Reference Code
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area. Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runways, taxiways, or aprons.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR Part 139, Certification of Airports.
CFR	Code of Federal Regulations
Construction	The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety And Phasing Plan. The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

Term	Definition
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FOD	Foreign Object Debris
HAZMAT	Hazardous Materials
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
Movement Area	The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See AC 150/5300-13, for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to AC 150/5300-13 for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
P&R	Planning and Requirements Group

Term	Definition
PAPI	Precision Approach Path Indicators
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicators
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.
SIDA	Security Identification Display Area
SMS	Safety Management System
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
Taxiway Safety Area	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13.
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See AC 150/5300-13 for guidance on declared distances.
TSA	Taxiway Safety Area Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicators

Term	Definition
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicators (PAPI), visual approach slope indicators (VASI), and pulse light approach slope indicators (PLASI).
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

Appendix 3. Safety and Phasing Plan Checklist

This appendix is keyed to Section 2. Plan Requirements. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not as a required submittal.

Coordination	Reference	Addressed			Remarks
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	205	☐ Yes	☐ No	☐ NA	
Operational safety is a standing agenda item for construction progress meetings.	205	☐ Yes	☐ No	☐ NA	
Scheduling of the construction phases is properly addressed.	206	☐ Yes	☐ No	☐ NA	
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	207.a	☐ Yes	☐ No	☐ NA	
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	207.a(1)	☐ Yes	☐ No	☐ NA	
Access routes used by ARFF vehicles affected by the project are addressed.	207.a(2)	☐ Yes	☐ No	☐ NA	
Access routes used by airport and airline support vehicles affected by the project are addressed.	207.a(3)	☐ Yes	☐ No	☐ NA	
Underground utilities, including water supplies for fire fighting and drainage.	207.a(4)	☐ Yes	☐ No	☐ NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	207.a(5)	☐ Yes	☐ No	☐ NA	
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	207.a	☐ Yes	☐ No	☐ NA	
Temporary changes to taxi operations are addressed.	207.b(1)	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Detours for ARFF and other airport vehicles are identified.	207.b(2)	☐ Yes	☐ No	☐ NA	
Maintenance of essential utilities and underground infrastructure is addressed.	207.b(3)	☐ Yes	☐ No	☐ NA	
Temporary changes to air traffic control procedures are addressed.	207.b(4)	☐ Yes	☐ No	☐ NA	
NAVAIDS					
Critical areas for NAVAIDs are depicted on drawings.	208	☐ Yes	☐ No	☐ NA	
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	208	☐ Yes	☐ No	☐ NA	
Protection of NAVAID facilities is addressed.	208	☐ Yes	☐ No	☐ NA	
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	208	☐ Yes	☐ No	☐ NA	
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	208, 213.a, 213.e(3)(a), 218.a	☐ Yes	☐ No	☐ NA	
Contractor Access					
The CSPP addresses areas to which contractor will have access and how the areas will be accessed.	209	☐ Yes	☐ No	☐ NA	
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	209	☐ Yes	☐ No	☐ NA	
The location of stockpiled construction materials is depicted on drawings.	209.a	☐ Yes	☐ No	☐ NA	
The requirement for stockpiles in the ROFA to be approved by FAA is included.	209.a	☐ Yes	☐ No	☐ NA	
Requirements for proper stockpiling of materials are included.	209.a	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Construction site parking is addressed.	209.b(1)	☐ Yes	☐ No	☐ NA	
Construction equipment parking is addressed.	209.b(2)	☐ Yes	☐ No	☐ NA	
Access and haul roads are addressed.	209.b(3)	☐ Yes	☐ No	☐ NA	
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, Painting, Marking and Lighting of Vehicles Used on an Airport, is included.	209.b(4)	☐ Yes	☐ No	☐ NA	
Proper vehicle operations, including requirements for escorts, are described.	209.b(5), 209.b(6)	☐ Yes	☐ No	☐ NA	
Training requirements for vehicle drivers are addressed.	209.b(7)	☐ Yes	☐ No	☐ NA	
Two-way radio communications procedures are described.	209.b(9)	☐ Yes	☐ No	☐ NA	
Maintenance of the secured area of the airport is addressed.	209.b(10)	☐ Yes	☐ No	☐ NA	
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	210	☐ Yes	☐ No	☐ NA	
Foreign Object Debris Management					
The airport operator's FOD management procedures are addressed.	211	☐ Yes	☐ No	☐ NA	
Hazardous Materials Management					
The airport operator's hazardous materials management procedures are addressed.	212	☐ Yes	☐ No	☐ NA	
Notification of Construction Activities					
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	213	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	213.a	☐ Yes	☐ No	☐ NA	
A list of local ATO/Technical Operations personnel is included.	213.a	☐ Yes	☐ No	☐ NA	
A list of ATCT managers on duty is included.	213.a	☐ Yes	☐ No	☐ NA	
A list of authorized representatives to the OCC is included.	213.b	☐ Yes	☐ No	☐ NA	
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	208, 213.b, 218.b(4)(i)	☐ Yes	☐ No	☐ NA	
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	213.b	☐ Yes	☐ No	☐ NA	
Emergency notification procedures for medical, fire fighting, and police response are addressed.	213.c	☐ Yes	☐ No	☐ NA	
Coordination with ARFF personnel for non-emergency issues is addressed.	213.d	☐ Yes	☐ No	☐ NA	
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	213.e	☐ Yes	☐ No	☐ NA	
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	213.e(3)(b)	☐ Yes	☐ No	☐ NA	
Inspection Requirements					
Daily inspections by both the airport operator and contractor are specified.	214.a	☐ Yes	☐ No	☐ NA	
Final inspections at certificated airports are specified when required.	214.b	☐ Yes	☐ No	☐ NA	
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	215	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	216	☐ Yes	☐ No	☐ NA	
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	217	☐ Yes	☐ No	☐ NA	
Runway and Taxiway Visual Aids - Marking, Lighting, Signs, and Visual NAVAIDs					
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	218.a	☐ Yes	☐ No	☐ NA	
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	218.a, 218.c, 219, 220.b(4)	☐ Yes	☐ No	☐ NA	
The requirement for markings to be in compliance with AC 150/5340-1, Standards for Airport Markings is specified.	218.b	☐ Yes	☐ No	☐ NA	
The requirement for lighting to conform to AC 150/5340-30, Design and Installation Details for Airport Visual Aids, AC 150/5345-50, Specification for Portable Runway and Taxiway Lights , and AC 150/5345-53 Airport Lighting Certification Program, is specified.	218.b(1)(f)	☐ Yes	☐ No	☐ NA	
The use of a lighted X is specified where appropriate.	218.b(1)(b), 218.b(3)	☐ Yes	☐ No	☐ NA	
The requirement for signs to conform to AC 150/5345-44, Specification for Runway and Taxiway Signs, AC 50/5340-18, Standards for Airport Sign Systems, and AC 150/5345-53, Airport Lighting Certification Program, is specified.	218.c	☐ Yes	☐ No	☐ NA	
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications.	219	☐ Yes	☐ No	☐ NA	
Hazard Marking and Lighting					
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	220.a	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	220.a	☐ Yes	☐ No	☐ NA	
The CSPP considers less obvious construction-related hazards.	220.a	☐ Yes	☐ No	☐ NA	
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	220.b(1)	☐ Yes	☐ No	☐ NA	
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	220.b(1)	☐ Yes	☐ No	☐ NA	
Red lights meeting the luminance requirements of the State Highway Department are specified.	220.b(2)	☐ Yes	☐ No	☐ NA	
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 in high.	220.b(4)	☐ Yes	☐ No	☐ NA	
Barricades marked with diagonal, alternating orange and white stripes are specified to indicate construction locations in which no part of an aircraft may enter.	220.b(4)	☐ Yes	☐ No	☐ NA	
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	220.b(5)	☐ Yes	☐ No	☐ NA	
Markings for temporary closures are specified.	220.b(5)	☐ Yes	☐ No	☐ NA	
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	220.b(7)	☐ Yes	☐ No	☐ NA	
Protection of Runway and Taxiway Safety Areas					
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	221.a(1), 221.c(1)	☐ Yes	☐ No	☐ NA	
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	221.a(2), 221.c(2)	☐ Yes	☐ No	☐ NA	

Coordination	Reference	Addressed			Remarks
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	221.c(3)	☐ Yes	☐ No	☐ NA	
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open.	221.a(4)	☐ Yes	☐ No	☐ NA	
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	221.a(4)	☐ Yes	☐ No	☐ NA	
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	221.a(4)	☐ Yes	☐ No	☐ NA	
Grading and soil erosion control to maintain RSA/TSA standards are addressed.	221.c(5)	☐ Yes	☐ No	☐ NA	
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	221.b	☐ Yes	☐ No	☐ NA	
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	221.c	☐ Yes	☐ No	☐ NA	
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	221.d	☐ Yes	☐ No	☐ NA	
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	221.e	☐ Yes	☐ No	☐ NA	
Provisions for protection of runway approach/departure areas and clearways are included.	221.f	☐ Yes	☐ No	☐ NA	
Other Limitations on Construction					
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	222.a(2)	☐ Yes	☐ No	☐ NA	
The CSPP prohibits the use of flare pots within the AOA at any time.	222.a(4)	☐ Yes	☐ No	☐ NA	
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	222.a(3)	☐ Yes	☐ No	☐ NA	

Appendix 4. Construction Project Daily Safety Inspection Checklist

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project.

Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			☐
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			☐
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			☐
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			☐
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			☐
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and approach zones.			☐
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.			☐
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.			☐

Item	Action Required	or	None
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.			☐
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.			☐
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.			☐
Obliterated or faded temporary markings on active operational areas.			☐
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			☐
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.			☐
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.			☐
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.			☐
Lack of radio communications with construction vehicles in airport movement areas.			☐
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.			☐
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.			☐
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			☐

Item	Action Required	or	None
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			☐
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.			☐
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			☐
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			☐
Site burning, which can cause possible obscuration.			☐
Construction work taking place outside of designated work areas and out of phase.			☐

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See pages 343-352

Port of Seattle Fire Department
Construction Standards

1. Fire Sprinkler Shut-Downs
   - Valves/Scheduling/Tracing fire mains or sprinkler lines
   - Fire System Draining/System Reset

2. Inspections
   - Construction / Final Inspections
   - Sprinkler
   - Alarm
   - Thrust Blocks
   - Fire-stop / Fire proofing

3. Fire Department Access
   - Access Roads
   - Knox Boxes / Construction Locks

4. Fire Mains
   - Testing Notification
   - Testing Pressures / Times
   - Gauge / Valve and Pump Procedures

5. Water Supply
   - Use of fire hydrants
   - Operation of Fire Main Valves
   - POS Boiler Room Functions
   - Fire Hydrant Installation Standards

6. Fire Alarms

7. Allowable Construction Materials
   - Lumber / Plywood
   - In tumescent paint
   - Sheet Plastic

8. Storage
   - Construction Materials
   - Refuse (Indoor and Outdoor)
   - Flammable / Combustible Gas and Liquid Containers

9. Temporary Structures
   - Installation on Airfield
   - Job Shacks

10. Permits
    - Fuel Storage Tanks
    - Tank Removal Permit

11. Construction Barricades (Indoor)

12. Hot Work Guidelines/Permits

1. Fire Sprinkler Shut Downs

All utility shut downs related to fire department are required to be submitted for review/approval 72 hours prior to work commencing.

This includes sprinkler/fire main shut-downs and fire alarm shut-downs. After all other departments have signed the shut-down request form, the fire department shall receive it for review. It will then be signed if it is approved.

The Port of Seattle Boiler room is responsible for the following, inside a building on airport property:

1) Turning valves

2) Scheduling shut- downs

3) Tracing water and sprinkler lines

4) Draining and Resetting systems

2. Inspections

Fire Inspections are conducted on a regular weekly basis. Office hours are 7:00 am to 4:00 pm Monday through Friday.

Fire inspections include but are not limited to: fire stopping, fire proofing, sprinkler and sprinkler hanger/bracing, thrust blocks, pressure testing of fire systems, flow and flush tests of fire mains/hydrants, and fire alarm acceptance. Final Inspections for occupancy are required to be submitted 24 hours in advance. The contractor requesting the final fire inspection shall contact his/her project manager prior to the inspection deadline, and the PM shall contact the fire department requesting an inspection.

Inspector	N	Phone Number
Fire Prevention Captain/Fire Marshall	Jeff Gagnes	(206) 787-4000
Construction	Dave Jaenicke	(206) 787-7290
	Jeff Handrickx	(206) 787-4665
Sprinkler	Leon Guiterrez	(206) 787-7109
Fire Alarm	Greg Carbaugh	(206) 787-4454
Plan Review	Mark Olmstead	(206) 787-4390

If at any time one of the above inspectors cannot be reached, please leave a message or call Fire Prevention Captain/Fire Marshall Jeff Gagnes at (206) 787-4000.

Thrust Blocks

Thrust blocks are required per NFPA 24 at any change in direction of fire main piping. Thrust blocks must be inspected by the fire department prior to the concrete pour (framed and without concrete). The fire department will also inspect the thrust block after it has been poured, and before it is buried.

3. Fire Department Access

All construction sites, whether the structure is built or not, must provide a street address per the Uniform Fire Code.

Access Roads

Access roads for fire department use are required per the Uniform Fire Code. They are required to be 20' wide and maintain access to all portions of the construction site. They are required to be kept clear at all times.

Knox/Key Boxes

Where access by key is required, the fire department requires a key box to be placed in an obvious location next to the door or in its vicinity, containing the key to allow entry to the locked area. The Port of Seattle construction lock is an AP-4 keyed padlock. It is the contractor's responsibility to provide this padlock through Port of Seattle channels. The fire department does not provide these locks.

4. Fire Mains

Testing Notification

Notification to the fire department 24 hours prior to any fire main acceptance testing is required.

Testing Pressures/Times

All testing of fire mains are required as follows:

1) Port of Seattle fire mains shall be tested to a pressure not less than 250 psi for 2 hours.

2) The fire department will inspect the fire main, gauges and testing process prior to the 2-hour duration. The test must be conducted using NFPA 24 criteria.

3) Pressure gauge and valve locations shall be as follows: the fire main or hydrant, etc. to be tested must have a gauge on the hydrant or main itself. The pump used to pressurize the hydrant or main shall be disconnected during the test. If this is not done correctly, the test will not be accepted.

5. Water Supply

Fire department water supply is required on all construction sites, per the Uniform Fire Code. A clear path to the fire hydrant, Fire Department Connection, etc. shall be provided.

Use of fire hydrants during construction

To use a fire hydrant for construction purposes, the contractor must first contact the fire department for approval prior to use. A back- flow prevention device (RPBA- Reduced Pressure Backflow Assembly), must be used and provided by the contractor doing the work. The Port of Seattle does not provide backflow prevention devices. The hydrant used must be fully opened or fully closed at all times to prevent undermining. A fire hydrant wrench must be the only tool used for opening hydrants. Water meters must also be used to gauge the amount of water used.

The Port of Seattle Boiler Room

The Port of Seattle boiler room is responsible for the following on airport property:
Port of Seattle Boiler room Contact Number: 248-7121.

1) The boiler room is to turn all water valves (including sprinklers), inside a building.

2) Sanitation/ bacteria testing

3) Scheduling of Shut- downs and pipe tracing

4) Draining and reset of water systems

Operation of Fire Main Valves

Any valves to be turned on the field, or outside a building for fire mains or fire hydrants, will only be turned by the Port of Seattle field crew. The fire department does not turn these valves. Any valves to be turned inside a building are to be turned by the Port of Seattle Boiler room personnel only.

Fire Hydrant Installation Standards

The Port of Seattle Fire Department in cooperation with Port of Seattle Maintenance is adopting the following standard hydrant installation. We adopt this standard to maintain uniformity on equipment and spare parts required to maintain hydrants.

- Upright Hydrant: M&H Style 929 "Reliant" Fire Hydrant; For additional information, see http://www.mh-valve.com/
  Hydrant to be painted red with reflective silver top cap
  Hydrant foot valve to be installed no less than 4 feet and no more than 10 feet from the base of the hydrant

- Flush Hydrant: M&H Fire Hydrant, Flush Model, AWWA Compression Type
  Flush hydrant box to be provided with adequate drainage to keep water from accumulating inside the box
  Flush hydrant location to be marked with reflective hydrant signs to match present

- Storz 5" Steamer Port Hydrant Adapter with blind cap and cable to be installed on all fire hydrants
  4" Pacific Coast Pumper thread – six (6) threads per inch
  Outside diameter – 4.828 inches
  Thread root diameter – 4.580 inches
  Thread length of male nipple – P.C.P. Standard
  No substitution is permitted

- Water mains shall be installed and tested per the Uniform Fire Code and NFPA 24 "Private Fire Service Mains and Their Appurtenances".

- All installations shall be approved by both the Port of Seattle Water Department and by Port of Seattle Fire Prevention prior to construction.

- Port of Seattle Fire Prevention shall inspect all installations prior to burial

- Port of Seattle Fire Prevention shall witness all tests. Contractor will present all necessary test forms at the time of the test. All tests require 48 hours advance notice to both the POS Water Department and POS Fire Prevention.

- All upright hydrants shall be provided with collision protection.

- Mega-lug type connections are not approved for installation without thrust blocking or rodding.

- All hydrants shall be painted red with reflectorized silver top. Paint is Sherwin Williams, Fast Dry Acrylic Enamel (F78R27). This is a water-based product used for the red base. The top is Rust-oleum high performance acrylic enamel (5215) which is also a water-based product used for the gray top. Reflectorized glass beads, band name; Highway Safety Spheres from Potters Industries, Inc. is applied to the gray top paint only.

6. Fire Alarms

Fire Alarm Requirements

1) All fire/smoke detection and alarm system components installed at the airport shall be compatible with the existing Port-owned proprietary fire alarm system (Grinnell/Autocall).

2) The Port of Seattle Fire Department shall approve all fire alarm system components prior to installation. (See fire alarm compatibility list.)

3) All fire alarm system components shall be connected to the Port-owned proprietary system.

4) The Tenant shall be responsible for providing the fire alarm devices.

5) Tenant is responsible for all wire, cable and conduit which is to be installed by a qualified Contractor from the device to a Port-owned fire alarm cabinet, designated by the Port of Seattle Fire Department.

6) Tenant's Contractor is responsible for terminations at the fire alarm device.

7) If no Port-owned fire alarm cabinets are available within a reasonable distance from the project as determined during the plan review process by the Port of Seattle Fire Department. The Port of Seattle Fire Department will supply a fire alarm cabinet. The cabinet shall be installed at the Tenant's expense and provide line voltage and a termination to the Port's proprietary system for monitoring.

8) All fire alarm panel components, fire alarm panel terminations and system programming is provided by the Port of Seattle Fire Department.

9) All fire alarm system installations shall be subject to the Port of Seattle Fire Department plan review process.

7. Allowable Construction Materials

Any lumber/wood used on airport property for construction, temporary barricade or any other reason shall be of fire-treated material. Any wood not treated with fire retardant material shall be painted with in-tumescent paint on both sides. Any sheet plastic used shall be of fire treated material. Expansion Foam use is not allowed.

8. Storage

Storage is only allowed in approved storage locations.

Construction Materials

Storage of construction materials is allowed only under the following circumstances:

1) The material being stored is in an approved location, protected for storage use.

2) The material being stored for construction use is stored on the job it is to be used for.

3) The amount of material to be stored is not to exceed the amount needed for use of the specified project for that day.

4) Stored materials are not to be in the exit corridor or path, blocking access to a fire lane or means of egress system, or stored under stairs.

Refuse

Trash, refuse or garbage may not be stored overnight in any location indoors. Refuse shall be removed after each shift. Refuse shall be removed in a timely manner from all outdoor construction sites.

Flammable/Combustible Gas and Liquid Containers

All flammable and combustible liquids to be used on a construction site must be kept in an approved location, whether it is in an approved flammable/combustible liquids storage cabinet, or in a remote area. The amount of product stored must not exceed the amount specified by the Fire Department. All Compressed gas cylinders must be chained in the upright position and stored in an approved location as well.

9. Temporary Structures

Airport Building Department

Basis of Policy: The inherent risks caused by having non-fire rate or non-fire protected structures on an airfield relate to their location, hazards and exposures where these structures are placed. Factors that prompt this policy are:

- The large proximity of aircraft and aircraft fueling operations to such buildings;

- Large numbers of ground service operations and equipment around them, and

- The potential exposure of fire and smoke to terminal buildings and large numbers of people therein

Definitions:

Temporary structures are trailers, modular buildings, and sheds that don't exceed 2,000 square feet, either in individual floor area or in an aggregate grouping.

Protected terminal buildings are those passenger transportation terminals/concourses that include interior sprinkler protection and exterior deluge sprinkler protection.

Life-Safety Provisions

1) Temporary structures shall not become permanent structures without complying with Port of Seattle Standards and minimum building code/fix code provisions for type of construction and other life-safety, structural and sanitation issues relative to its occupancy group.

2) No temporary structure shall remain at its approved location more than one consecutive 180-day period without written authorization for 180-day extensions from the Building Official and Port Fire Marshal. Such time limit or extensions may be revoked for due cause.

3) All temporary structures shall be a minimum of 50' from any aircraft fuel vent, fuel truck, or fuel hydrant cart in accordance with NFPA Standard No. 407.

4) Minimum clearance of temporary structures from the terminals shall be as follows:

   - Unprotected terminal building to protected temporary structure – 20'
   - Protected terminal building to unprotected temporary structure – 20'
   - Protected terminal building to protected temporary structure – 5'

5) Unprotected temporary structures shall not be placed within a terminal building.

Job Shacks

Job shacks on construction sites shall meet compliance with applicable fire department code regulations. They shall be inspected prior to occupancy. They shall be equipped with the proper type and amount of fire extinguishers. Each door shall be marked with an exit sign above it.

10. Permits

All contractors wishing to place a fuel storage tank in service on airport property must obtain a permit from the fire department. Fuel storage tanks must be inspected by the fire department prior to being placed in service with product, and in an approved location.

Tank Removal permits are also required prior to removing an underground fuel storage tank. The fire department will perform an inspection prior to any fuel tank removal.

11. Construction Barricades (Indoors)

The location of all indoor construction barricades shall be inspected by the Fire Department prior to installation. All construction barricades shall be constructed of fire treated or metal studs, and fire treated plywood. The fire treated stamp must be visible on the inside of the barricade. Any wood on airport property to be used as a construction barricade shall be of fire treated material, or painted with in tumescent paint on both sides. Construction barricades, if padlocked, shall be equipped with an AP-4 keyed padlock, or a knox box. The holes in the barricade doors for the padlock and chain shall be large enough for the fire department personnel to reach through and unlock it from either side of the barricade. This prevents being locked-in or locked-out of an area.

12. Hot Work Guidelines

- All open flame or spark producing operations including, but not limited to, cutting welding, brazing, soldering, and grinding on Sea-Tac Airport property shall require a Hot Work Permit form the Port of Seattle Fire Department.

    A. Hot Work Permits are free of charge and available by calling Fire Dispatch at (206) 787-5327.

        - Emergency operations in the airport may delay the response of the firefighter issuing the permit. For better service, call Fire Dispatch one hour in advance.

        - Contractors working within a construction zone with no risk to non-construction personnel may be issued a weekly permit. These permits will be made out to the nearest Tuesday and will be renewed after an inspection of the work site.

    B. The contractor is responsible for making the work area as fire safe as possible.

        - Hot Work Area: Any area exposed to sparks, hot slag, and radiant or convective heat as a result of hot work.

        - Prohibited areas: Hot work shall not be conducted in rooms or areas where flammable liquids or vapors, lint, dust, or combustible storage is at risk of ignition from sparks or hot metal.

        - Combustibles: All combustible material within 35’ of the hot work area shall be removed or covered with a burn blanket to prevent ignition from heat, sparks, or slag.

        - Openings: Openings or cracks in walls, floors, ducts, or shafts within the hot work area shall be tightly covered to prevent the passage of sparks to adjacent combustible areas. Shielding by metal or fire resistant guards or curtains shall also be provided to prevent passage of sparks or slag into potentially hazardous areas.

- Overhead work: When hot work is performed above locations where persons are likely to pass, non-combustible shields shall be used for protection from sparks and hot metal or oxide. The contractor shall provide a live fire watch below any spark producing operation above areas occupied by non-construction personnel or by the general public. Additional fire watch personnel may be required as determined by the Fire Department.

- Housekeeping: Floors shall be kept clean and/or swept within the work area.

- Conveyor systems: Conveyor systems that could carry sparks to distant combustibles shall be shielded or shut down.

- Exterior hot work on the AOA: No hot work is permitted within 50' of any aircraft. If an aircraft is fueling, all hot work is to stop until fueling is complete.

- Fuel lines: Any hot work involving fuel lines containing fuel shall require a standby a POSFD apparatus and crew. The contractor shall compensate in the POSFD using the Washington State Schedule of Standard Charges.

- Compensation of POSFD: Contact the Fire Department at (206) 787-5327 and request a copy of the Washington State Standard Charge Sheet. Upon receipt of the charge sheet, issue a letter of agreement for charges to POSFD. After completion of the project, the Fire Department will submit an invoice to the Port of Seattle Accounting Department who will then submit a bill to the contractor.

Pre-hot work inspection:

- Hot work site: The individual responsible for the hot work and a representative of the Fire Department shall inspect the entire area before starting any hot work. The inspection shall insure that all of the above requirements are followed, including, but not limited to:

  A. Hot work equipment is inspected and verified in good working condition by the operator.

  B. Exposed construction if of non-combustible material or properly covered.

  C. There are no exposed combustibles on the opposite side of partitions, walls, ceilings, or floors.

  D. The fire watch shall be equipped with a fire extinguisher and shall be trained in its use.

  E. In all hot work areas, fire extinguishers shall be provided and maintained by the contractor and verified operable.

Fire Watch:

1. General: A fire watch shall be provided during hot work activities and shall continue for a minimum of thirty minutes, or as otherwise determined by the Fire Department representative, for up to four hours after the conclusion of the work. Exception: A fire watch may not be required when the hot work area has no fire hazards or combustible exposures.

2. Location: The fire watch shall include the entire work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual shall have additional personnel assigned to fire watch to ensure that all exposed areas are monitored.

3. Duties: Individuals designated to fire watch detail shall have a fire extinguisher readily available and shall be trained in its use. It is the responsibility of the fire watch to look for spot fires, extinguish them if possible, stop the hot work, and notify the Fire Department immediately for investigation.

Hot Work Permit: A sign-off sheet, (i.e., Hot Work Permit) that indicates that the required safety precautions have been met shall be signed by the Fire Department Representative and the person responsible for doing the hot work. This permit shall be located at the job site and a carbon copy will be held at the Fire Station until the date on the permit has expired.

A. Scope

Through implementation of the Stretch & Flex program, we hope to eliminate the number of and reduce the severity of work place related injuries. In addition, we also hope to enhance the overall health and welfare of each one of the employees so they can enjoy life to its fullest both at work and home.

B. Benefits

There are many benefits to the Stretch & Flex program. Following are some of the major ones we have identified. For a detailed explanation of benefits, refer to Section M.

1. Physical Benefits
   - Improved physical performance.
   - Increased flexibility.
   - Increased relaxation of the muscle.
   - Muscles are more efficient and have greater endurance.
   - Decreased muscle tension.
   - Greater range of motion.
   - Improved coordination of our muscles and joints.
   - Improves circulation to the muscles (i.e. warming it up).
   - Increased strength of the muscle.
   - Improved posture.
   - Reduces degeneration of the joints (i.e. lubricating joints).
   - Improved nerve function.

2. Psychological Benefits
   - Personal gratification of increased health.
   - Increased sense of well-being.
   - Increased enjoyment.
   - Increased team morale.
   - Increased circulation stimulates the brain.
   - Prepares the mind for work activities.
   - Relaxes the mind prior to activity.
   - Establishes a healthy routine to each day.

3. Miscellaneous Benefits
   - Reduces the incidence and severity of workplace injuries.
   - Allows time to discuss the day's events (i.e. Pre-task Plan).
   - Allows time to conduct a mini-safety meeting.
   - Everyone benefits financially.
   - Improve leadership and communication skills.

C. Guidelines

Stretching is intended to reduce injuries and increase health…not the other way around. Therefore, in order to get the most benefit out of the Stretch & Flex program certain stretching guidelines must be followed.

- Before beginning any stretch, we should put our body into a neutral position. This is standing up straight and relaxed, with our feet shoulder width apart, shoulders, neck and arms relaxed, shoulders and head back and stomach slightly tensed.
- At all times during stretching we should be breathing fully and deeply. Also, breath slowly and regularly. **AVOID HOLDING YOUR BREATH WHILE STRETCHING.**
- When performing stretches, we **never** want to **force the stretch** or aggravate previous injuries. Therefore, if you have a muscle or joint which has been recently injured, do the stretches lightly at first. If the stretch significantly increases the pain in the muscle or joint, then stop the stretch and allow your body to heal. Consult a doctor if needed.
- Stretches should be taken to a comfortable tension. Once we reach the point of comfortable tension, let your muscles relax, breath and hold the stretch**. DO NOT BOUNCE** and **DO NOT STRAIN.** Stretching should **NOT** be painful, therefore if you are experiencing pain, back off a little on your tension.
- To get the maximum out of your stretches, they should be **held for 15-30 seconds** at a time. Any time less than this provides no real benefits. After 30 seconds we are not adding any further benefit to the muscle. A little warm-up prior to stretching may increase your benefit.
- It is important to do all of the stretches **at your own pace** and according to what your body tells you. Just because everyone can bend over and touch the ground with their hands does not mean you have to force or bounce yourself into that position too. Everyone's body is different.
- To maximize the stretches, you may need to change the stretch slightly. Trying slightly different positions or a different type of stretch may be needed to target the area you need stretched the most.

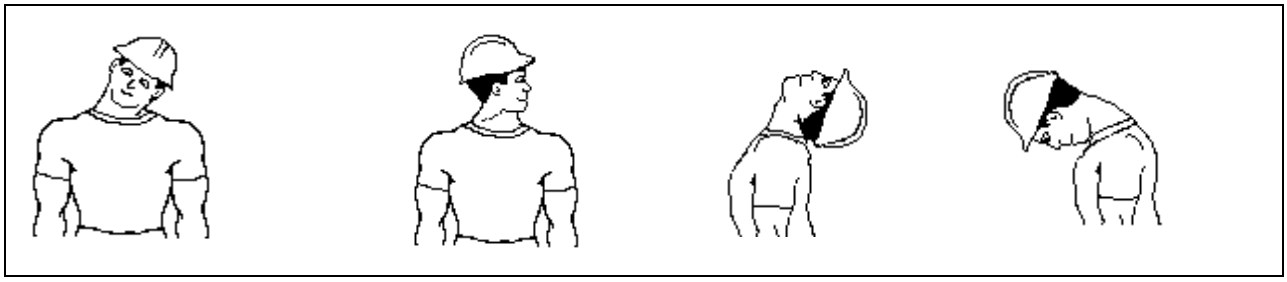
D. The Stretches - Program

1. The Stretch & Flex program is designed to be both efficient and effective. It is organized to help everyone get the maximum benefit from the program and the stretches can be performed in a minimal amount of time. There are 8 categories of stretches, each with several options that you may use to provide variety, as well as freedom to choose alternative stretches, that may focus on an area of need.

2. The object is to perform at least one stretch from each category each day. Ideally all of these stretches should be performed each day; however, time and practicality may not allow us this freedom. For improved health we recommend you perform these stretches on your own time either at home, during lunch or after work. The 8 categories of stretches are:
    - Neck
    - Shoulder
    - Arm and Forearm
    - Wrist
    - Upper Body and Chest
    - Lower Back
    - Leg and Thigh
    - Calf

E. Neck Stretches

1. General Neck Stretch
    - Slowly lower the head/neck sideways, pulling the left ear toward the left shoulder.
    - Hold for 15-30 seconds
    - Repeat on the right side, to the front, to the back and by turning as far as you can to both the left and right.

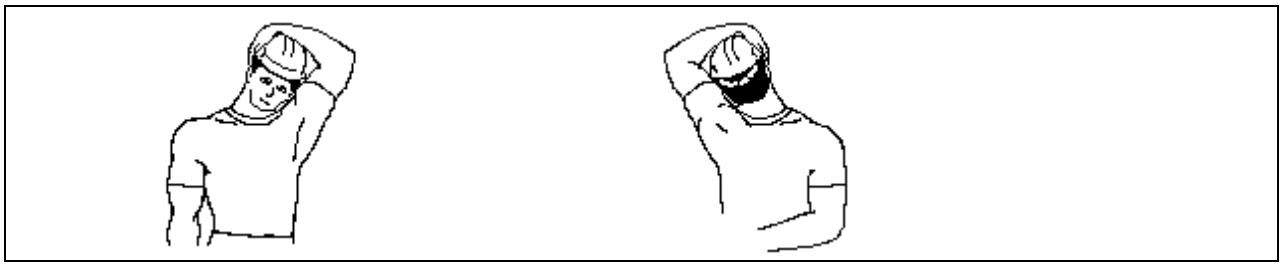


Tips:

- Do not lift up your shoulder to touch your ear to it. Just move your head.
- Always keep your head in neutral midline as much as possible. (i.e. don't drop your head forward or back when tilting your neck sideways)
- To increase the stretch, use your hands to VERY GENTLY pull your head/neck in the direction of stretch.

2. Ear-Hole Stretch

- Place the middle finger of your left hand in the right ear (over your head).
- Now gently pull your head towards your left shoulder, keeping your head facing straight forward and midline.
- Hold for 15-30 seconds.

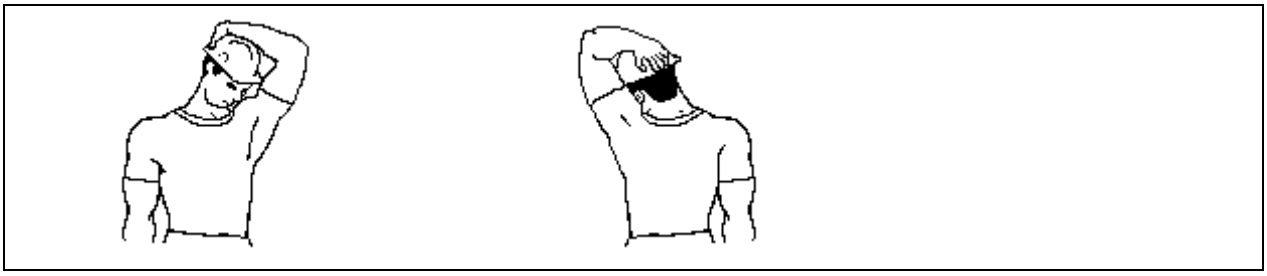


Tips

- Do not pull too hard as you may strain a muscle – this stretch should be done GENTLY.
- Push your right shoulder down (when stretching to the left) to increase the stretch.
- Keep your nose facing forward and your head upright.

3. “Arm Pit” Stretch

- Turn your head as far as you can to the left and then from that position try putting your nose into your left armpit. (Do not breathe too deeply here!)
- Using your left hand reach behind your head and GENTLY pull your head down into your armpit, in the direction your nose is pointing.
- Hold for 15-30 seconds.
- Let go and move your head slightly towards the right and repeat. Eventually you will end up with your nose in the right armpit (changing hands you pull with as you cross the middle of your chest).



Tips

- Do not pull down too hard – you may strain a muscle. This stretch should be done GENTLY.
- Push/pull down your opposite shoulder to increase the stretch
- Make sure you pull in the same direction your nose is pointing to get the best stretch possible
- Relax your shoulders and neck

F. Shoulder Stretches

1. Shoulder Rotations

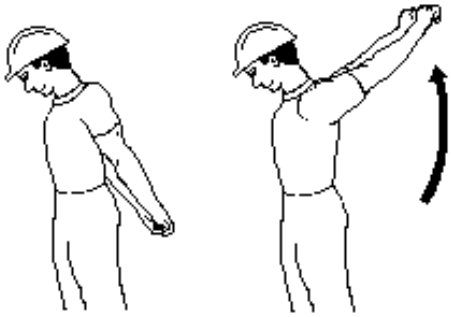
- Start with arms straight out on both sides with palms facing down and start moving SLOWLY in small circles in a forward direction. Gradually increase the size of the circles until you have hit the max.
- Start over except this time with palms up, starting with small circles going in a backwards direction and gradually increasing.

Tips

- Do not do this stretch quickly. You get a better stretch if you go slowly. This slow speed also helps prevent injury.
- Stand up straight with shoulders and head back to increase the benefit

2. Shoulder Extensions

- Clasp your hands behind your back and bend your knees slightly.
- Slowly start to raise your arms up as you slightly bend forward at the waist.
- Once your arms have gone as high as they can go, try to keep them there as you slowly try to stand up straight.



Tips

- Relax your chest and shoulders to maximize the stretch.
- Push your chest up and forward to increase the stretch
- If you have shoulder problems (i.e. dislocations/chronic pain) perform this stretch with caution.

3. Shoulder Rolls
    - Stand straight up with shoulders and head back, arms to your sides.
    - Slowly rotate both shoulders forward 5 times, in as wide of circles as possible
    - Repeat with 5 circles in the opposite direction

Tips

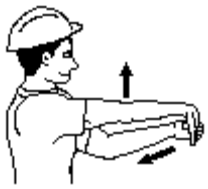
- To increase the stretch, stand as tall and straight as possible.
- By pushing your chest forward and shoulders back you can further maximize the stretch.
- Do not let your head fall forward.

G. Arm and Forearm Stretches
    1. Triceps Stretch
        - Reach overhead and place your fingers as far as you can down the center of your back.
        - With your other hand, gently push the elbow backwards and up.
        - Hold for 15-30 seconds and repeat on the other side.

Tips

- To change the focus of the stretch, you can change the direction you push (a little to the left or right) or the position of your arm. (i.e. Moving your fingers from your spine to directly behind your shoulder)
- To maximize the stretch you can try thrusting your chest/armpit forward as you push back on your elbow.

2. Forearm Flexor Stretch
   - Straighten your right arm directly in front of your body with palm facing up.
   - With the other hand bend the right wrist backwards while you push your right elbow up
   - Hold for 15-30 seconds and repeat with other hand.



Tips

- To change the focus of the stretch you can turn your right wrist clockwise (left counterclockwise) as you stretch.
- To help increase the stretch, try pulling back on your fingertips rather than your wrist.

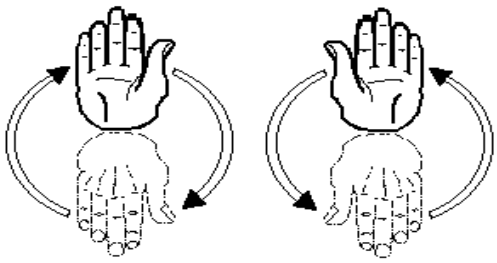
H. Wrist Stretches

1. Prayer Stretch
   . Place your palms together like you are praying.
   a. Keeping the palms together raise your elbows and/or lower your hands.
   b. Hold for 15-30 seconds.

Tips

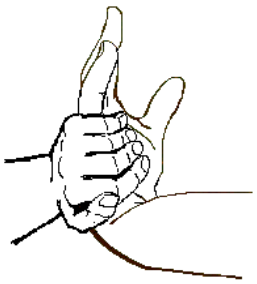
- You can turn your fingertips toward your body, away from your body or point them down to focus the stretch on the areas you need most.
- You do not need to press your hands together too tight. Try to relax your arms and wrists as much as possible.

2. Wrist Rotations
   - Put both arms straight out in front of you with palms facing down.
   - SLOWLY rotate your wrists in wide circles (as far as you can go).
   - Do 5 circles of each wrist and then change direction.
   - Do 5 slow circles in the opposite direction.



Tips

- If you keep your elbows straight, you will get a better stretch.
- By doing the stretch slowly, you get a better stretch and avoid possible wrist injury.
- Wrist Flexion Stretch
- Put your right hand straight out in front of you with the thumb pointing straight down.
- With your left hand grab the top of your right hand and slowly pull your hand towards your chest.
- Hold the stretch for 15-30 seconds and repeat for the left hand.



Tips

- To increase the stretch on the wrist, try turning your right wrist counterclockwise (when on the right wrist) with your left hand and vice versa. Use your palm of your left hand to help turn your right wrist.

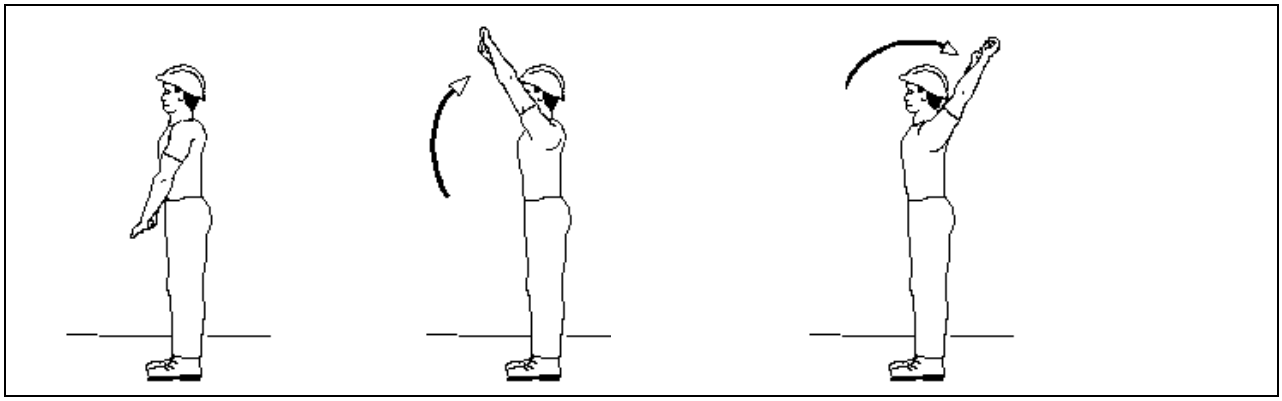
I. Upper Body and Chest Stretches

1. Upper Back Stretch
   - Bend the right elbow and lift it to the same height as your shoulder.
   - Pull your right elbow across the front of your body as far as you can (with your left hand), while relaxing your right shoulder and back.
   - Turn your head in the opposite direction you pull and hold for 15-30 seconds.
   - Repeat on the opposite side.

Tips

- Keep the elbow high – especially if you have a large chest or arms.
- Make sure that you relax your back and shoulder as much as possible when performing this stretch.
- To maximize the stretch you get (to target the tighter muscles), change the height of your elbow and/or the direction you pull.

2. Overhead Stretch
   - Interlock your hands or thumbs in front of your body.
   - Slowly raise your arms as high as you can, making sure you do not arch your back.
   - Reach as high and as far back as you can and hold for 15-30 seconds.



Tips

- Make sure you are standing straight up, with head up and chest out.
- You may need to unlock your hands/thumbs to get a better stretch.
- Envision reaching back as high and far as you can.

3. Lateral Stretch
   - Put your right hand beside your right hip.
   - With your left hand (arm bent) reach up over your head as far as you can. Bend your upper body and head to the right as well. Reach down with your right hand.
   - Hold for 15-30 seconds and repeat on the opposite side.

Tips

- Ensure that you bend with your upper body and not your lower body.
- Do not twist or bend forward or backward.
- Envision lifting your armpit as high as you can to help with the stretch.
- Keep both feet on the ground firmly.

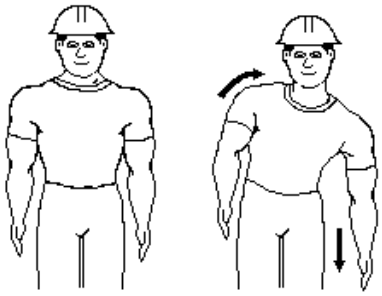
4. Lateral Rotation Stretch
   - Grasp your left hip with your right hand and raise your left arm to shoulder height, with the palm facing up.
   - Turn and reach as far back as you can to your left. Pull with your right hand to help twist.

- Hold for 15-30 seconds and repeat on the opposite side.

Tips

- To avoid injury you must do this stretch slowly and return to the starting position slowly. No whipping or throwing our body into position.
- Try pushing your left hip forward (if turning to the left) to maximize the stretch.
- Do not force or bounce this stretch.

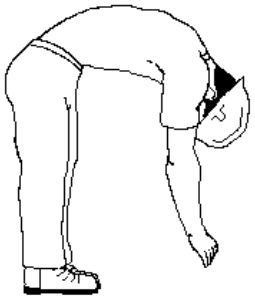
5. Sidebends
   - Stand straight with the arms to the side.
   - With your right hand slide down the side of your right leg as far as you can and bend your lower back to the right side.
   - Hold for 15-30 seconds and repeat on the opposite side.



Tips

- Do not lean forward or backward.
- Do not twist your body.
- Push your waist in the opposite way you are stretching to maximize the stretch.

J. Lower Back Stretches
   1. Back Stretch
      - Keeping the knees bent slightly, SLOWLY bend over and try to touch your toes.
      - Tuck the chin as well and hold for 15-30 seconds.



Tips

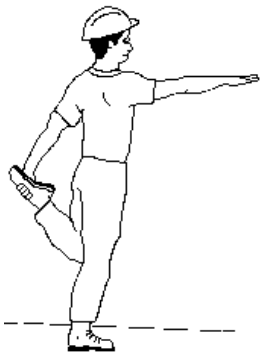
- Do not bounce in this stretch. Deep breathing can be used to help further the stretch (on the exhale).
- To maximize the stretch, try pushing your bellybutton straight up/back.
- This stretch should be done slowly to avoid injury. Use your legs to crawl up with your hands, if necessary, to help you get back up slowly.

K. Legs and Thighs

1. Hamstring Stretch
    - Assume a stride position with the right leg forward. Put your hands above your right knee and shift most of your weight to your left leg.
    - Keeping your back straight and head upright, slowly bend your left knee and bend your body over your right leg (keeping your right leg straight).
    - Hold for 15-30 seconds and then use your arms to stand up straight and repeat on other leg.

Tips

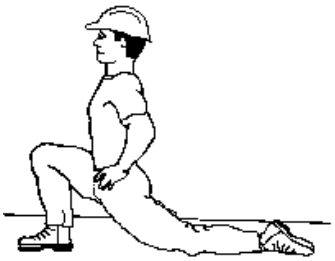
- To focus the stretch on your tightest muscles you can point your toe in or out.
- Always keep your back straight and head up.
- You can lift your toes up off the ground to get a greater stretch as well.
- Quadriceps Stretch
- Reach and grab your left ankle with your left hand and pull up. Keeping your knee pointed downward, pull up on your ankle and thrust your left hip forward.
- Hold for 15-30 seconds and repeat on opposite side.



Tips

- Changing where your ankle is can help focus the stretch on the tight muscles. Pull it in towards the middle or away to the side to change the area of stretch.
- Pushing your hip forward and standing up straight will help increase the stretch.
- Use something for balance (a coworker, wall etc.).

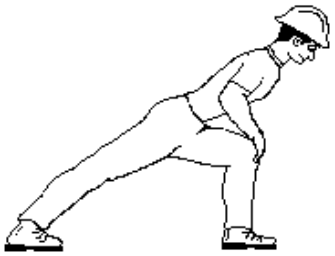
2. Runner's Stretch
   - Assume a stride position with the hands on the front knee or hips.
   - Keeping your back and head straight, go into a squat with your front leg, using your back leg for balance. Push your hips forward.
   - Hold for 15-30 seconds.
   - Use your arms to help push yourself back up to a standing position.



Tips
- Pushing your hips forward and down will help with the stretch.
- Use your arms to straighten out your upper body to increase the stretch.
- Keep your front knee midline to avoid injury.

L. Calf Stretches
   1. Calf Stretch
      - Assume a stride position with the left leg forward. Keep the right leg straight with the heel on the ground.

- Bend your left knee and place your hands on top. Lean forward and push down on your back heel.
- Hold for 15-30 seconds and then repeat on the opposite leg.



Tips

- Pushing the hips forward and knee back can help maximize the stretch.
- Lengthening your stride can also focus the stretch.
- Point your toe straight, in or out to change the area of the stretch on your calf.

2. Soleus Stretch
   - Assume a stride position with the left leg forward. Keep the right leg *slightly bent* with the heel on the ground.
   - Bend your left knee and place your hands on top and lean forward and push down on your right heel.
   - Hold for 15-30 seconds and then repeat on the opposite leg.

Tips

- To increase this stretch, push your knee down towards the floor while keeping your heel on the ground.

3. Crossed-Leg Stretch
   - Stand with one leg crossed over the other.
   - Slowly bend forward and try to touch your hands to the ground.
   - Keep your knees as straight as possible.
   - Hold for 15-30 seconds and then change legs.

Tips

- Push your front leg against your back leg to increase the stretch.
- Change the position your toe points to maximize the stretch.

M. Benefits of Stretch & Flex – in detail

1. Physical Benefits

The main benefit of stretching is to **reduce the tension on the muscle** by slowly and gradually lengthening the muscle. This decrease in tension results **in relaxation of the muscle** and **improved flexibility**.

By increasing your flexibility, you become more limber and as a result the joints are able to move through **a greater range of motion.** By decreasing the tension of the muscles, tendons and ligaments the joints are able to move more freely and with a greater degree of freedom. Further, by decreasing the tension on our muscles or relaxing them, we greatly reduce the amount of energy required by the muscles overall to do their job and therefore **prevent muscle fatigue**. To illustrate this point, picture someone with very tight triceps. To overcome the pull of the tight triceps (the antagonist), the biceps muscle (the agonist) has to work harder to go through a normal flex of the arm. Therefore, the tight muscle in this case causes the other muscles to get tired earlier than they normally would. Along this same train of thought, a more relaxed antagonistic muscle **improves the strength** of the agonistic muscle. Using the same example above, the tight triceps is exerting a force against the action of the biceps. As a result, the biceps is unable to lift as much weight. If the triceps were relaxed, the biceps could lift a greater amount, and therefore would be a much stronger muscle. All of these benefits mentioned combine to improve a person's overall **physical performance**.

By allowing a muscle to relax, the muscle is not in constant tension or prolonged contraction. A muscle in constant contraction needs more energy to accomplish activities as mentioned above. A side effect of a muscle being in constant tension is that the circulation to the muscle is choked off. Fresh blood and

nutrients to the muscle are reduced and toxins and by-products from the muscle cannot be flushed from the area. This lack of circulation further puts the muscle at risk. Toxins and lack of proper nutrition to the muscles promote inflammation, shortening, soreness and tightening of the muscle. Therefore, tight muscles promote further tightening. Stretching **helps promote circulation** by causing the muscles to relax and hence taking the clamp off the blood vessels that travel through the muscle. Improved circulation also helps to warm up the muscle by improving the flow of blood to the area. A warmer muscle is more flexible, much like hot metal is easier to bend than cold metal.

Like the blood vessels, a tight muscle may clamp on a nerve, resulting in numbness, weaker muscles and slight pain or soreness. Stretching will **improve the function of the nerves**.

Decreasing the tension in the muscle may help to **prevent injury** caused by over-stretching or over-exerting the muscle. If the muscle is relaxed, then a sudden force applied to a muscle may not exceed its normal ability to stretch and therefore not tear. Another way in which stretching helps prevent injury, is that it can help restore balance between the muscles. Most people have unbalanced muscles, a stronger arm or leg and tasks during the day that stress different muscles. Stretching helps **to balance out the muscles** and can also **help with posture**. Postural problems are most often due to muscular imbalances in addition to poor habits and the effects of gravity. Having poor posture puts a greater strain on the body overall. By re-balancing and re-aligning the soft tissue structures we can help prevent injury, reduce muscle fatigue and improve the physical performance of the body. There have also been some studies that show stretching may help reduce the muscle soreness found after heavy exercise or activity.

Some other physical benefits of stretching that result from the joint going through a greater range of motion, is that the **wear and tear on a joint will be decreased** and there will be **improved coordination** of the muscles and joints. Moving the joints increases the production of synovial fluid (fluid within the joint for lubrication). Synovial fluid is both nutritious and a lubricant. Therefore, increased fluid will maintain the healthy condition of our joints, preventing degeneration or arthritis. Furthermore, if our joints can move more freely, we will have better coordination of our actions.

2. Psychological Benefits
   It has been proven that people who actively pursue a healthy lifestyle are **happier** and obviously are **healthier**. With that, comes a **personal satisfaction** and gratification of being healthy. All of this leads to a greater enjoyment of work and life in general.

Though not strictly a psychological benefit, engaging in an active stretching program improves the circulation to the muscles as well as the rest of the body. Exercise (stretching) promotes the release of hormones in the body, which give us energy and make us more alert. The **mind is stimulated** and you are **more clear-headed** and **alert**, thus making you more ready to face the hazardous environment. The time also allows the **mind to relax** from the commute or stresses of the morning and focus on the task at hand, easing you into the day.

By engaging in Stretch & Flex each morning, everyone maintains **a healthy routine** to every day. Research has proven that establishing a set routine to each day promotes a balance in hormones and patterns throughout the body. This balance further adds to your health and mental functioning. We all are aware of how getting thrown off our daily cycle makes us fatigued and messes up our body and mind. (e.g. jet lag, shift work or oversleeping)

3. Miscellaneous Benefits
   Research has proven that an active morning stretch program **reduces the incidence and severity of workplace injuries.** This benefit is obvious. Not only does everyone go home healthy each day, which is the primary goal, but everyone benefits by having healthy, happy and productive employees.