

**Chapter 296-880 WAC
UNIFIED SAFETY STANDARDS FOR FALL PROTECTION**

NEW SECTION

WAC 296-880-080 Scope. This chapter sets forth requirements for employers to provide and enforce the use of fall protection for employees performing activities covered under this chapter.

NEW SECTION

WAC 296-880-090 Quick reference guide.

Unified Fall Protection Quick Reference Guide

General fall protection for all industries	Threshold height	WAC
Above or adjacent to dangerous equipment	Regardless of height	296-880-10010(1)
Holes into which an employee can trip, step into, or step through	Regardless of height	296-880-10010(2)
Falling into or onto impalement hazards	Regardless of height	296-880-10010(3)
When on a walking/working surface	Four feet or more	296-880-20005
Ramps, runways, and inclined walkways	Four feet or more	296-880-20005(2)
Holes where work is being performed	Four feet or more	296-880-20005(3)
Skylights	Four feet or more	296-880-20005 (3)(b)
Hatchway and chute holes	Four feet or more	296-880-20005 (3)(c)
Ladderways	Four feet or more	296-880-20005 (3)(d)
Pits and trap door holes	Four feet or more	296-880-20005 (3)(e)
Repair pits and service pits	Four feet or more	296-880-20005 (3)(f)
Manholes	Four feet or more	296-880-20005 (3)(g)
Openings	Four feet or more	296-880-20005(4)
Formwork and reinforcing work	Four feet or more	296-880-20005(5)
Steep pitch roof - Regardless of task	Four feet or more	296-880-20005(6)
Low pitch roof - Other than roofing work or constructing a leading edge	Four feet or more	296-880-20005(7)
Hazardous slopes	Four feet or more	296-880-20005(9)
Vehicles and rolling stock - If suitable anchorages cannot be provided or creates a greater hazard	Four feet or more	296-880-20005(10)
Specific requirements not addressed in WAC 296-880-200 (above)		
Construction work *See also chapter 296-155 WAC		
Roofing work on a low pitch roof	Ten feet	296-880-30005(1)
Constructing a leading edge	Ten feet	296-880-30005(1)
Engaged in the erection or placement of structural members	Ten feet	296-880-30005(1)
Engaged in excavation and trenching operations	Ten feet	296-880-30005(1)
Order pickers (PITS) *See also chapter 296-863 WAC		

General fall protection for all industries	Threshold height	WAC
Operators of order pickers	Regardless of height	296-880-30010 (1) and (2)
Elevating work platforms *See also chapter 296-869 WAC		
Vehicle mounted aerial devices	Regardless of height	296-880-30015(1)
Manually propelled and self-propelled elevating work platforms	Regardless of height if required by manufacturer	296-880-30015(2)
Boom supported elevating work platforms	Regardless of height	296-880-30015(3)
Powered platforms *See also chapter 296-870 WAC		
Working on a roof or other elevated working area	Four feet or more	296-880-30020(5)
Window cleaning *See also chapter 296-878 WAC		
Working on a roof or other elevated working area	Four feet or more	296-880-30025(1)
Scaffolds *See also chapter 296-874 WAC		
Working on a scaffold	Ten feet or more	296-880-30030(1)
Cranes - Under the scope of chapter 296-155 WAC, Part L		
For nonassembly/disassembly work	Six feet or more	296-880-30035(2)
For assembly/disassembly work	Ten feet or more	296-880-30035(3)
Towercranes - Work other than erecting, climbing, and dismantling	Six feet or more	296-880-30035 (4)(a)
Towercranes - Erecting, climbing, and dismantling work	Ten feet or more	296-880-30035 (4)(b)
Telecommunications work *See also chapter 296-32 WAC	Four feet or more	296-880-200 and 296-880-30040
Qualified electrical workers *See also chapter 296-45 WAC	Four feet or more	296-880-200
Ship repairing, shipbuilding and shipbreaking *See also chapter 296-304 WAC		
Working aloft or elsewhere at elevation	Five feet or more	296-880-30045
Longshore, stevedore and waterfront related operations *See also chapter 296-56 WAC		
Maintenance work on cranes, spouts, or similar types of equipment	Eight feet or more	296-880-30050(1)
Floor or wall openings or waterside edges, including bridges or gangway-like structures	Four feet or more	296-880-30050 (2)(a)
Ski area facilities and operations *See also chapter 296-59 WAC		
Working at unprotected elevated locations	More than ten feet	296-880-30055 (1)(a)

NEW SECTION

WAC 296-880-095 Definitions. For the purposes of this chapter the following definitions apply:

Aerial device. A vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel.

Affected area. The distance away from the edge of an excavation equal to the depth of the excavation up to a maximum distance of fifteen feet. For example, an excavation ten feet deep has an affected area extending ten feet from the edge of any side of the excavation.

Anchorage. A secure point of attachment for lifelines, lanyards, or deceleration devices which is capable of withstanding the forces specified in this chapter.

Boom-supported elevating work platform. A self-propelled, integral chassis, elevating work platform with a boom-supported platform that can be positioned completely beyond the base.

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 of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; and who is capable of identifying existing and potential fall hazards; and who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the requirements contained in this chapter regarding the installation, use, inspection, and maintenance of fall protection equipment and systems.

Connector. A device which is used to connect parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a harness, or a snap hook spliced or sewn to a lanyard or self-retracting lanyard).

Construction work. All or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling of buildings and other structures and all operations in connection therewith; the excavation, construction, alteration and repair of sewers, trenches, caissons, conduits, pipe lines, roads and all operations pertaining thereto; the moving of buildings and other structures, and to the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments or any other construction, alteration, repair or removal work related thereto.

Deceleration device. Any mechanism, such as a rope grab, rip-stitch 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 full body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Dropline. A vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

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.

Equivalent. Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate and will provide an equal or greater degree of safety for employees than the methods, materials, or designs specified in this standard.

Fall arrest system. A fall protection system that will arrest a fall from elevation. Fall arrest systems include personal fall arrest systems that are worn by the user, catch platforms, and safety nets.

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

Fall protection work plan. A written planning document in which the employer identifies all areas on the job site where a fall hazard of ten feet or more exists. The plan describes the method or methods of fall protection to be used to protect employees, and includes the procedures governing the installation, use, inspection, and removal of the fall protection method or methods which are selected by the employer. See WAC 296-880-10020.

Fall restraint system. A system in which all necessary components function together to restrain/prevent an employee from falling to a lower level. Types of fall restraint systems include standard guard-rail systems, personal fall restraint systems, warning line systems, or a warning line system and safety monitor.

Feasible. It is possible to perform the work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically possible to use any one of these systems to provide fall protection.

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 full 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 they operate and fall arrest forces occur.

Full body harness. A configuration of connected straps that meets the requirements specified in ANSI Z359.1, that may be adjustable to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

Full body harness system. A full body harness and lanyard which is either attached to an anchorage meeting the requirements of this chapter; or it is attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in this chapter.

Handrail. A rail used to provide employees with a handhold for support.

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

Hazardous slope. A slope from which construction work is performed where normal footing cannot be maintained without the use of devices due to the pitch of the surface, weather conditions, or surface material.

Hole. A gap or void two inches or more in its least dimension, in a floor, roof, or other surface.

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

Lanyard. A flexible line of webbing, rope, or cable used to secure a positioning harness or full body harness to a lifeline or an anchorage point usually two, four, or six feet long.

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. A leading edge is considered to be an "unprotected side or edge" during periods when it is not actively and continuously under construction.

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 which is part of a fall protection system used as back-up safety for an elevated worker or as a restraint for workers on a flat or sloped surface.

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; used to minimize roll out or accidental disengagement.

Low pitched roof. A roof having a slope equal to or less than four in twelve.

Maintenance. The work of keeping a building, machine, roadway, etc., in a state of good repair.

Manually propelled elevating work platform. A manually propelled, integral chassis, elevating work platform with a platform that cannot be positioned completely beyond the base.

Mechanical equipment. All motor or human propelled wheeled equipment except for wheelbarrows, mopcars, robotic thermoplastic welders, and robotic crimpers.

Opening. A gap or void thirty inches (76 cm) or more high and eighteen inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal fall arrest system. A fall arrest system that is worn by the employee to arrest the employee in a fall from elevation. It consists of an anchor point, connectors, a full body harness, and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

Personal fall restraint system. A fall restraint system that is worn by the employee to keep the employee from reaching a fall point, such as the edge of a roof or elevated work surface. It consists of an anchor point, hardware assemblies, a full body harness and may include a lanyard, restraint lines, or suitable combinations of these.

Platform. A work surface elevated above the surrounding floor or ground.

Positioning device system. A full body harness or positioning harness that is worn by an employee, and is rigged to allow an employee to be supported on an elevated vertical or inclined surface, such as a wall, pole or column and work with both hands free from the body support.

Positioning harness. A body support that meets the requirements specified in ANSI Z359.1 that encircles and closes around the waist and legs with attachment elements appropriate for positioning work.

Predictable and regular basis. Employee tasks which are performed either:

- (a) At least once every two weeks; or
- (b) Four employee-hours or more during any sequential four-week period. (To calculate employee-hours multiply the number of employees by the number of hours during a four-week period).

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.

Repair. To restore a building, machine, roadway, etc., to an original state after damage or decay.

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 the worker from falling to a lower level.

Roof. The exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily become the top surface of a building.

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 the 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 full body 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. See WAC 296-880-40025.

Runway. A passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

Safety line. See "lifeline."

Safety monitoring system. A type of fall restraint system in which a competent person whose only job responsibility is to recognize and warn employees of their proximity to fall hazards when working between the warning line and the unprotected sides and edges, including the leading edge of a low pitch roof or other walking/working surface.

Safety net system. A type of fall arrest system, as described in WAC 296-880-40055.

Safety watch system. A fall protection system as described in WAC 296-880-40050, in which a competent person monitors one worker who is engaged in repair work or servicing equipment on low pitch roofs only.

Scaffold. A temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.

Self-propelled elevating work platform. A self-propelled, integral chassis, elevating work platform with a platform that cannot be positioned completely beyond the base.

Self-rescue device. A piece of equipment designed to allow a person, who is suspended in a personal fall arrest system, to independently rescue themselves after the fall by moving the device up or down until they reach a surface and are no longer suspended.

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

Service. To repair or provide maintenance for.

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

Snap hook. See "locking snap hook."

Standard guardrail system. A type of fall restraint system that is a vertical barrier consisting of a top rail and midrail, and toeboard 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, ramps, platforms, or runways.

Standard strength and construction. Any construction of guardrails, handrails, covers, or other guards that meets the requirements of this chapter.

Static line. See "horizontal lifeline."

Steep pitched roof. A roof having a slope greater than four in twelve.

Structural member. A support that is a constituent part of any building or structure. Structural members include columns, girders, beams, trusses, joists, and similar supporting members of a building or structure.

Suitable. That which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

Toeboard. A vertical barrier at floor level erected along all open sides or edges of a floor opening, platform, runway, ramp, or other walking/working surface to prevent materials, tools, or debris from falling onto persons passing through or working in the area below.

Unprotected sides and edges. Any open side or edge of a floor, roof, balcony/deck, platform, ramp, runway, or walking/working surface where there is no standard guardrail system, or parapet wall of solid strength and construction that is at least thirty-nine inches in vertical height.

Walking/working surface. Any surface, whether horizontal or vertical on which an employee walks, works, or gains access to a work area or workplace location. Walking/working surfaces include, but are not limited to, floors, the ground, roofs, ramps, bridges, runways, stairs, dockboards, formwork, and reinforcing steel but not including ladders.

Warning line system. A barrier erected on a walking and working surface or a low pitch roof (four in twelve or less), to warn employees that they are approaching an unprotected fall hazard(s).

NEW SECTION

WAC 296-880-100 Application. Requirements that apply to all sections of this chapter.

NEW SECTION

WAC 296-880-10005 General requirements. (1) The employer must ensure that all surfaces on which employees will be working or walking on are structurally sound and will support them safely prior to allowing employees to work or walk on them.

(2) Inspection criteria.

(a) The employer must inspect all components (including hardware, lanyards, and positioning harnesses or full body harnesses depending on which system is used) of personal fall arrest systems, personal fall restraint systems, and positioning device systems prior to each use according to manufacturer's specifications for mildew, wear, damage, and other deterioration. The employer must remove defective components from service if their function or strength has been adversely affected.

(b) The employer must inspect safety nets at least once a week according to manufacturer's specifications for wear, damage, and other deterioration. The employer must also inspect safety nets after any occurrence which could affect the integrity of the safety net system. The employer must remove defective components from service. The employer must not use defective nets.

(3) The employer must only use personal fall arrest systems, personal fall restraint systems, positioning device systems, and their components for employee protection and not to hoist materials.

(4) The employer must plan for and provide prompt rescue of employees in the event of a fall or must assure the self-rescue capability of employees.

NEW SECTION

WAC 296-880-10010 Fall protection required regardless of height.

(1) Regardless of height, the employer must guard open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, such as dip tanks and material handling equipment, and similar hazards with a standard guardrail system.

(2) The employer must guard holes into which an employee can trip, step into, or step through by a cover of standard strength and construction or a standard guardrail system.

Note: Requirements for protecting employees from falling into or through holes where fall hazards of four feet or more are located in WAC 296-880-20005.

(3) Regardless of height the employer must protect employees from falling into or onto impalement hazards, such as: Reinforcing steel (rebar), exposed steel, or wood.

NEW SECTION

WAC 296-880-10015 Training. (1) Provide fall protection training for employees exposed to fall hazards. The employer must provide training for each employee exposed to fall hazards. The training must enable each employee to recognize the hazards of falling and procedures to be followed in order to minimize those hazards.

(2) Each affected employee must be trained by a competent person to know at least the following:

(a) The nature of fall hazards in the work area;

(b) When fall protection is required;

(c) What fall protection is required;

(d) The correct procedures for erecting, maintaining, assembling, disassembling, and inspecting the fall protection systems to be used;

- (e) The use and operation of fall protection systems used;
- (f) Limitations of fall protection systems used;
- (g) Proper care, maintenance, useful life, removal from service;

and

- (h) The requirements of this chapter.

(3) Make sure before an employee is allowed to perform work requiring the use of fall protection that the employee can:

- (a) Demonstrate an understanding of the training specified above;

and

- (b) Demonstrate the ability to use fall protection properly.

(4) Retrain employees who use fall protection, if necessary. Retrain an employee when the employer has reason to believe the understanding, motivation, and skills required to use fall protection has not been retained. Circumstances where retraining is required include:

(a) Changes in the workplace that make previous training out of date;

(b) Changes in the types of fall protection to be used make previous training out of date; and

(c) Work habits or demonstrated knowledge indicate that the employee has not retained the necessary understanding, skill, or motivation to use fall protection.

(5) Document fall protection training. Document in writing that each employee has received and understood the required training. This documentation must include:

- (a) Name of each employee;

- (b) Date(s) of training;

- (c) Subject(s) of the training; and

(d) Name or signature of the competent person who conducted the training, signature of the employer, or employers designee.

Note: Documentation may be stored electronically as long as it is available to safety and health personnel from the department of labor and industries.

NEW SECTION

WAC 296-880-10020 Fall protection work plan required at ten feet or more. (1) The employer must develop and implement a written fall protection work plan including each area of the work place where the employees are assigned and where fall hazards of ten feet or more exist.

(2) The fall protection work plan must:

- (a) Identify all fall hazards in the work area;

(b) Describe the method of fall arrest or fall restraint to be provided;

(c) Describe the proper procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used;

(d) Describe the proper 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 area;

(f) Describe the method for prompt, safe removal of injured workers; and

- (g) Be available on-site for inspection by the department.

(3) Prior to permitting employees into areas where fall hazards of ten feet or more exist the employer must ensure employees are

trained and instructed in the items described in subsection (2) (a) through (f) of this section.

Note: A fall protection work plan is not required where the use of a guardrail system eliminates the fall hazard.

NEW SECTION

WAC 296-880-200 Fall protection required at four feet or more.

This section sets forth requirements for the use of fall protection at four feet or more unless specifically addressed in WAC 296-880-300 of this chapter.

NEW SECTION

WAC 296-880-20005 Fall protection required at four feet or more.

(1) Walking/working surfaces with unprotected sides or edges. Except as required in subsections (2) through (10) of this section, the employer must ensure that each employee on a walking/working surface with an unprotected side or edge four feet or more above the ground or lower level is protected by one of the following fall protection systems:

(a) A standard guardrail system, or the equivalent, as specified in WAC 296-880-40005, on all open sides, except where there is entrance to a ramp, stairway, or ladder. The guardrail must be provided with a standard toeboard wherever: Beneath the open sides, persons can pass, there is moving machinery, or there is equipment with which falling materials could create a hazard.

(i) When employees are using stilts, the height of the top rail or equivalent member of the guardrail system must be increased (or additional rails may be added) an amount equal to the height of the stilts while maintaining the strength specifications of the guardrail system.

(ii) Where employees are working on or from platforms or ladders above the protection of the guardrail system, the employer must either increase the height of the guardrail system (or additional rails may be added) or select and implement another fall protection system as specified in (b), (c), (d), (e), or (f) of this subsection.

(iii) When guardrails must be temporarily removed to perform a specific task, the area must be constantly attended by an employee until the guardrail is replaced. The only duty the employee must perform is to warn persons entering the area of the fall hazard. The employee must be protected from the fall hazard by a personal fall arrest system or personal fall restraint system.

(b) A personal fall restraint system;

(c) A personal fall arrest system;

(d) A safety net system;

(e) A catch platform; or

(f) A warning line system.

(2) Guarding of ramps, runways, and inclined walkways.

(a) Ramps, runways, and inclined walkways that are four feet or more above the ground or lower level must be equipped with a standard guardrail system or the equivalent, as specified in WAC 296-880-40005,

along each open side. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard must also be installed on each open side to protect persons working or passing below.

(b) Runways used exclusively for special purposes may have the guardrail on one side omitted where operating conditions necessitate such omission, provided the falling hazard is minimized by using a runway not less than eighteen inches wide.

Note: See WAC 296-880-40010 for other specific criteria for ramps, runways, and inclined walkways.

(3) Holes.

(a) The employer must protect employees from falling into or through holes four feet or more to the ground or lower level by one of the following fall protection systems:

(i) A standard guardrail system, or the equivalent, as specified in WAC 296-880-40005, on all open sides, except where there is entrance to a ramp, stairway, or ladder. The guardrail must be provided with a standard toeboard wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard;

(ii) A cover, as specified in WAC 296-880-40015;

(iii) A warning line system erected at least fifteen feet from all unprotected sides or edges of the hole and meets the requirements of WAC 296-880-40040;

(iv) When the cover, guardrail system, or warning line system must be temporarily removed to perform a specific task, an employee must remain at the hole until the cover, guardrail system, or warning line system is replaced. The only duty the employee must perform is to warn persons entering the area of the fall hazard. The employee must be protected from the fall hazard by a personal fall arrest system or personal fall restraint system; or

(v) Personal fall arrest systems or personal fall restraint systems.

(b) The employer must guard skylight holes and skylights.

(i) Unprotected skylight holes must be guarded by covers of standard strength and construction, standard guardrail systems on all exposed sides, or employees must be protected by personal fall restraint systems, or personal fall arrest systems.

(ii) If the skylight has been installed and is not capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the skylight at any one time, the skylight must be guarded by a cover of standard strength and construction, a standard guardrail system on all sides, or employees must be protected by personal fall restraint systems, or personal fall arrest systems.

(c) The employer must guard hatchways and chute holes by one of the following:

(i) Hinged covers of standard strength and construction and a standard guardrail system with only one exposed side. When the hole is not in use, the cover must be closed or the exposed side must be guarded at both top and intermediate positions by removable standard guardrail systems; or

(ii) A removable standard guardrail system with toeboard on not more than two sides of the hole and fixed standard guardrail system with toeboards on all other exposed sides. The removable guardrail must be kept in a place when the hole is not in use and must be hinged or otherwise mounted so as to be conveniently replaceable.

(d) The employer must guard ladderways or platforms by a standard guardrail system with standard toeboards on all exposed sides, except at the entrance to a hole, with the passage through the guardrail either provided with a swinging gate or so offset that a person cannot walk directly into the hole.

(e) The employer must guard pits and trap door holes by covers of standard strength and construction. While the cover is not in place, the pit or trap door holes must be protected on all exposed sides by a standard guardrail system.

(f) The employer must guard repair pits, service pits, and assembly pits by a cover, a guardrail system, a fall restraint system or fall arrest system.

(g) The employer must guard manholes by standard covers which need not be hinged in place. While the cover is not in place, the hole must be constantly attended or must be protected by a removable standard guardrail system.

(4) Guarding of openings. The employer must ensure that each employee working on, at, above, or near openings (including those with chutes attached) where the outside bottom edge of the opening is four feet or more above a lower level and the inside bottom edge of the opening is less than thirty-nine inches above the working surface, are protected from falling by the use of a guardrail system, a safety net system, a personal fall arrest system, or personal fall restraint system.

(5) Fall protection during form and reinforcing work. The employer must ensure that employees exposed to fall hazards of four feet or more while placing or tying reinforcing steel or working on the face of formwork or reinforcing steel are protected by personal fall arrest systems, positioning device systems, or safety net systems.

(6) Fall protection on steep pitched roofs. Regardless of the work activity, the employer must ensure that employees exposed to fall hazards of four feet or more while working on a roof with a pitch greater than four in twelve use one of the following:

(a) Fall restraint system. Safety monitor systems and warning line systems are prohibited on steep pitched roofs;

(b) A personal fall arrest system; or

(c) A positioning device system.

(7) Fall protection on low pitched roofs. The employer must ensure that employees exposed to fall hazards of four feet or more while engaged in work, other than roofing work or constructing a leading edge on low pitched roofs use one of the following:

(a) A personal fall restraint system;

(b) A personal fall arrest system;

(c) A positioning device system; or

(d) A warning line system.

(8) Safety watch system. When one employee is conducting repair work or servicing equipment on a low pitch roof four feet or more above a lower level, employers are allowed to use a safety watch system in accordance with WAC 296-880-40050.

(9) Hazardous slopes. Employees exposed to falls of four feet or more while performing construction work on a hazardous slope must use personal fall restraint systems or positioning device systems.

(10) Vehicles and rolling stock. The employer must ensure that employees exposed to fall hazards of four feet or more to the ground or lower level from vehicles or rolling stock on which employees must be located in order to perform their job duties are protected by fall arrest systems, fall restraint systems, or positioning device systems.

Exception: Where suitable anchorages cannot be provided or when the use of fall protection creates a greater hazard, work may be performed on vehicles or rolling stock without a fall protection system.

NEW SECTION

WAC 296-880-20010 Exemption from fall protection requirements in this section. Employees are exempt from WAC 296-880-20005 under the following conditions:

(1) During initial installation of the fall protection anchor prior to engaging in any work activity, or the disassembly of the fall protection anchor after all work activities have been completed.

(2) When employees are inspecting, investigating, or assessing roof level conditions or work to be performed only on low pitch roofs prior to the start of any work activity or after all work activities have been completed.

This exemption does not apply on steep pitch roofs, where construction work is underway, or when fall protection systems or equipment meeting the requirements of this chapter have been installed and are available for workers to use for pre-work and post-work inspections, investigations, or assessments.

Note: Examples of activities the department recognizes as inspecting or estimating include:

- Measuring a roof to determine the amount of materials needed for a project;
- Inspecting the roof for damage without removing equipment or components; and
- Assessing the roof to determine what method of fall protection will be provided to employees.

Note: Examples the department does not recognize as inspecting or estimating under this exemption include:

- Delivering, staging or storing materials on a roof; and
- Persons estimating or inspecting on roofs that would be considered a "hazardous slope" by definition.

NEW SECTION

WAC 296-880-300 Specific fall protection requirements. This section addresses specific fall protection requirements not already addressed in WAC 296-880-200 of this chapter.

NEW SECTION

WAC 296-880-30005 Construction work. This section applies to work activities under the scope of chapter 296-155 WAC, Safety standards for construction work, unless specifically addressed in WAC 296-880-200 of this chapter.

(1) The employer must ensure that a fall arrest system, fall restraint system, or positioning device system is provided, installed, and implemented in accordance with this chapter when employees are exposed to fall hazards of ten feet or more to the ground or lower level while:

- (a) Engaged in roofing work on a low pitched roof;
- (b) Constructing a leading edge;

Exception: Employees not directly involved with constructing the leading edge, or are not performing roofing work must comply with WAC 296-880-200 Fall protection required at four feet or more.

- (c) Engaged in the erection or placement of structural members.

Exception: When the erection or placement of structural members is performed on or from a floor, deck, roof, or similar surface you must comply with WAC 296-880-200 Fall protection required at four feet or more.

(d) Engaged in excavation and trenching operations.

(i) Exceptions. Fall protection is not required at excavations when employees are:

(A) Directly involved with the excavation process and on the ground at the top edge of the excavation; or

(B) Working at an excavation site where appropriate sloping of side walls has been implemented as the excavation protective system.

(ii) Fall protection is required for employees standing in or working in the affected area of a trench or excavation exposed to a fall hazard of ten feet or more; and:

(A) The employees are not directly involved with the excavation process; or

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

Note: Persons considered directly involved in the excavation process include:

1. Foreman of the crew.
2. Signal person.
3. Employee hooking on pipe or other materials.
4. Grade person.
5. State, county, or city inspectors inspecting the excavation or trench.
6. An engineer or other professional conducting a quality-assurance inspection.

(2) Employees are exempt from WAC 296-880-30005 under the following conditions:

(a) During initial installation of the fall protection anchor prior to engaging in any work activity, or the disassembly of the fall protection anchor after all work activities have been completed;

(b) When employees are inspecting, investigating, or assessing roof level conditions or work to be performed only on low pitch roofs prior to the start of construction work or after all construction work has been completed;

This exemption does not apply on steep pitch roofs, where construction work is underway, or when fall protection systems or equipment meeting the requirements of this chapter have been installed and are available for workers to use for pre-work and post-work inspections, investigations, or assessments.

Note: Examples of activities the department recognizes as inspecting or estimating include:

- Measuring a roof to determine the amount of materials needed for a project;
- Inspecting the roof for damage without removing equipment or components; and
- Assessing the roof to determine what method of fall protection will be provided to employees.

Note: Examples the department does not recognize as inspecting or estimating under this exemption include:

- Delivering, staging, or storing materials on a roof; and
- Persons estimating or inspecting on roofs that would be considered a "hazardous slope" by definition.

(c) When employees must be located on vehicles, or rolling stock in order to perform their job duties.

NEW SECTION

WAC 296-880-30010 Order pickers (PITS). This section applies to powered industrial trucks under the scope of chapter 296-863 WAC, Forklifts and other powered industrial trucks.

(1) The employer must ensure all persons operating an order picker are protected by standard guardrails on all open sides; or

(2) A full body harness and lanyard that are connected to a tie-off point that has been approved by the PIT manufacturer.

Additional requirements for powered industrial trucks can be found in chapter 296-863 WAC, Forklifts and other powered industrial trucks.

NEW SECTION

WAC 296-880-30015 Elevating work platforms. (1) This section applies to the following types of elevating work platforms covered under the scope of chapter 296-869 WAC, Elevating work platforms:

- (a) Aerial lifts;
- (b) Manually propelled elevating work platforms that have a platform that cannot be positioned completely beyond the base;
- (c) Self-propelled elevating work platforms that have a platform that cannot be positioned completely beyond the base;
- (d) Boom-supported elevating work platforms that have a boom-supported platform that can be positioned completely beyond the base.

EXEMPTION: This section does not apply to elevating work platforms used:
1. By the fire services for fire combat that are covered by chapter 296-305 WAC, Safety standards for firefighters; or
2. For agriculture activities covered by chapter 296-307 WAC, Safety standards for agriculture.

(2) This subsection applies to vehicle mounted aerial devices. Before elevating the platform, the employer must ensure all persons on the platform wear a full body harness with a lanyard attached to either:

- (a) The manufacturer's recommended attachment point; or
- (b) The boom or platform if the manufacturer does not specify an attachment point.

The employee must never attach a lanyard to an adjacent pole, structure, or equipment.

(3) This subsection applies to manually propelled and self-propelled elevating work platforms. Before elevating the platform, the employer must ensure all persons on the platform are wearing fall protection devices and other safety gear, if required by the manufacturer of the platform.

(4) This subsection applies to boom supported elevating work platforms. Before elevating the platform, the employer must ensure all persons on the platform of boom-supported elevating work platforms wear a full body harness and lanyard fixed to manufacturer provided and approved attachment points.

Additional requirements for elevating work platforms can be found in chapter 296-869 WAC, Elevating work platforms.

NEW SECTION

WAC 296-880-30020 Powered platforms. This section applies to permanent powered platform installations dedicated to interior or exterior building maintenance of a specific structure or group of structures under the scope of chapter 296-870 WAC, Powered platforms.

(1) Building owner certifications. The employer must obtain written certification from the building owner of any building with a powered platform installation that was completed or had major modification done after July 23, 1990, that the building and equipment meets

the requirements of new installations-buildings in WAC 296-870-600 and new installations-equipment in WAC 296-870-700.

Note:

The building owner needs to base the certification on:

1. The field test of the installation done before it is first placed into service or following any major modification to an existing installation; and
2. All other relevant available information including, but not limited to:
 - a. Test data;
 - b. Equipment specifications;
 - c. Verification by a registered professional engineer.

(2) The employer must obtain written certification from the building owner that the installation:

(a) Has been inspected, tested, and maintained as required by inspection, testing, and maintenance in WAC 296-870-300; and

(b) All fall protection anchorages meet the requirements of WAC 296-880-40020.

(3) The employer must prohibit employees from using the installation until the building owner has provided the required written certifications.

(4) The employer must protect employees on working platforms with a personal fall arrest system that meets the requirements of WAC 296-880-40020.

(5) The employer must ensure employees working on a roof or other elevated working surface four feet or more above a lower level are protected in accordance with WAC 296-880-200.

Additional requirements for powered platforms can be found in chapter 296-870 WAC, Powered platforms.

NEW SECTION

WAC 296-880-30025 Window cleaning. This section applies to all window cleaning activities performed on the inside or outside of a building in which the window cleaner is working from a level that is located more than four feet above grade or lower level under the scope of chapter 296-878 WAC, Safety standards for window cleaning.

(1) The employer must ensure employees working on a roof or other elevated working surface four feet or more above a lower level are protected in accordance with WAC 296-880-200.

(2) The employer must ensure all workers suspended from a boat-swain's chair or rope descent system use an independent fall arrest system where the fall arrest anchorage is separate from the suspension system anchorage.

(3) The employer must ensure workers assemble and wear their personal fall arrest equipment before they approach the point of suspension.

(4) The employer must ensure workers are connected at all times to the fall arrest system while they are suspended.

(5) The employer must prohibit use of the following equipment for window-cleaning operations:

(a) Portable ladders;

(b) Window jacks;

(c) Capstan devices to suspend workers; and

(d) Suspension or fall-arrest ropes made entirely of polypropylene that do not have a minimum breaking strength of five thousand pounds (22.2 kN).

Additional requirements for window cleaning can be found in chapter 296-878 WAC, Safety standards for window cleaning.

NEW SECTION

WAC 296-880-30030 Scaffolds. This section applies to suspended and supported scaffolds under the scope of chapter 296-874 WAC, Scaffolds.

(1) The employer must protect each employee on a scaffold from falling ten feet or more to a lower level, by providing either:

- (a) A personal fall arrest system; or
- (b) Guardrails.

(2) The employer must ensure personal fall arrest systems are attached by a lanyard to one of the following:

- (a) Vertical lifeline;
- (b) Horizontal lifeline; or
- (c) Appropriate structural member of the scaffold.

Note: Specifications for these personal fall arrest systems can be found in WAC 296-880-40020.

Note: Specifications for guardrail systems used with scaffolds can be found in subsection (8) of this section.

Note: Specifications for vertical lifelines can be found in subsection (9) of this section.

Note: Specifications for horizontal lifelines can be found in subsection (10) of this section.

(3) Provide fall protection for persons erecting or dismantling supported scaffolds.

(a) The employer must have a competent person determine the feasibility of providing fall protection for persons erecting or dismantling supported scaffolds.

(b) The employer must provide fall protection if the installation and use of fall protection is:

- (i) Feasible; and
- (ii) Does not create a greater hazard.

(4) The employer must ensure employees erecting the scaffold install the guardrail system, if required, before the scaffold is used by any other employees.

(5) Provide fall protection if a scaffold is too far from the work face. The employer must provide a guardrail system along the front edge of the platform, or have employees use a personal fall arrest system, if the distance from the front edge of the platform to the work face is greater than:

- (a) Eighteen inches (46 cm) for scaffolds used for plastering and lathing operations;
- (b) Fourteen inches (36 cm) for all other scaffolds.

(6) Provide specific types of fall protection for specific types of scaffolds.

(a) The employer must use a personal fall arrest system to protect employees on the following scaffolds:

- (i) Boatswain's chair;
- (ii) Catenary scaffold;
- (iii) Float scaffold;
- (iv) Ladder jack scaffold;
- (v) Needle beam scaffold.

(b) The employer must use a personal fall arrest system and a guardrail system to protect employees on:

- (i) Single-point adjustable suspension scaffolds; and
- (ii) Two-point adjustable suspension scaffolds.

(7) The employer must protect employees working on a self-contained adjustable scaffold that has the platform:

(a) Supported by the frame structure, using a guardrail system with a minimum two-hundred pound top rail capacity;

(b) Suspended by ropes, using:

(i) A guardrail system with a minimum two-hundred pound top rail capacity; and

(ii) A personal fall arrest system.

(8) The employer must protect employees on walkways located within a scaffold by using a guardrail system that meets all of the following:

(a) Has a minimum two-hundred pound top rail capacity;

(b) Is installed within nine and one-half inches (24.1 cm) of the walkway; and

(c) Is installed along at least one side of the walkway.

(9) Ensure vertical lifelines used with personal fall arrest systems meet these requirements:

(a) The employer must make sure vertical lifelines are all of the following:

(i) Fastened to a fixed, safe point of anchorage;

(ii) Independent of the scaffold; and

(iii) Protected from sharp edges and abrasion.

Note: Safe points of anchorage include structural members of buildings, but do not include:

1. Standpipes, vents, or other piping systems;

2. Electrical conduit;

3. Outrigger beams; and

4. Counterweights.

(b) The employer must ensure vertical lifelines, independent support lines, and suspension ropes are not attached to any of the following:

(i) Each other;

(ii) The same point of anchorage; or

(iii) The same point on the scaffold.

(c) The employer must ensure vertical lifelines, independent support lines, and suspension ropes do not use the same point of anchorage.

(d) The employer must ensure independent support lines and suspension ropes are not attached to a personal fall arrest system.

(e) The employer must ensure vertical lifelines are not used with single-point or two-point adjustable suspension scaffolds that have overhead components such as overhead protection or additional platform levels.

(10) Ensure horizontal lifelines used with personal fall arrest systems meet these requirements:

(a) The employer must equip single-point or two-point adjustable suspension scaffolds that use horizontal lifelines or structural members of the scaffold for fall protection with both of the following:

(i) Additional independent support lines that are equal in number and equivalent in strength to the suspension ropes; and

(ii) Automatic locking devices capable of stopping the scaffold from falling if one or both of the suspension ropes fail.

(b) The employer must make sure horizontal lifelines are secured to either:

(i) Two or more structural members of the scaffold; or

(ii) Looped around both the suspension ropes and independent support lines above the hoist and brake attached to the end of the scaffold.

(c) The employer must ensure independent support lines and suspension ropes are not:

(i) Attached to each other or the same point on the scaffold;

(ii) Attached to or use the same point of anchorage.

(d) The employer must ensure independent support lines and suspension ropes are not attached to either:

(i) A personal fall arrest system; or

(ii) The same point on the scaffold as a personal fall arrest system.

(e) The employer must ensure, if a horizontal lifeline is used where it may become a vertical lifeline, that the device used to connect a lanyard to the horizontal lifeline is capable of locking in both directions on the lifeline.

(11) The employer must ensure independent support lines and suspension ropes are not:

(a) Attached to each other or the same point on the scaffold;

(b) Attached to or use the same point of anchorage.

(12) The employer must ensure independent support lines and suspension ropes are not attached to either:

(a) A personal fall arrest system; or

(b) The same point on the scaffold as a personal fall arrest system.

(13) The employer must ensure, if a horizontal lifeline is used where it may become a vertical lifeline, that the device used to connect a lanyard to the horizontal lifeline is capable of locking in both directions on the lifeline.

(14) The employer must ensure guardrails, if required, are installed along all open sides and ends of platforms.

EXEMPTION: For employees doing overhand bricklaying operations from a supported scaffold, a guardrail is not required on the side next to the wall.

(15) The employer must ensure the height of the top rail, top edge, or the equivalent member, of supported scaffolds is:

(a) At least thirty-six inches (0.9 m) and not more than forty-five inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service before January 1, 2000;

(b) At least thirty-eight inches (0.97 m) and not more than forty-five inches (1.2 m) above the platform surface for scaffolds manufactured or first placed in service after January 1, 2000;

(c) The employer must ensure the height of the top rail, top edge, or the equivalent member, of suspended scaffolds that require guardrails and personal fall arrest systems, is at least thirty-six inches (0.9 m) and not more than forty-five inches (1.2 m) above the platform surface.

EXEMPTION: When conditions warrant, the height of the top edge of the top rail may be greater than forty-five inches if the guardrail meets all other criteria of this section.

(16) The employer must make sure the top edge of the top rail does not drop below the required height when the minimum load, shown in Table 2, Minimum Top Rail and Midrail Strength Requirements, is used.

(17) The employer must make sure each top rail and midrail, or equivalent member, of a guardrail system is able to withstand, without failure, the force shown in Table 1, Minimum Top Rail and Midrail Strength Requirements, when the force is applied as follows:

(a) To the top rail in a downward or horizontal direction at any point along its top edge;

(b) To the midrail in a downward or horizontal direction at any point.

Note: Midrail includes screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of the guardrail system.

Table 1

**Minimum Top Rail and Midrail
Strength Requirements**

Type of Scaffold	Top Rail Capacity	Midrail Capacity
Single-point adjustable suspension scaffolds Two-point adjustable suspension scaffolds	100 pounds (445 N)	75 pounds (333 N)
All other scaffolds Walkways within a scaffold	200 pounds (890 N)	150 pounds (666 N)

(18) The employer must install midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members as follows:

- (a) Midrails at a height approximately midway between the top edge of the guardrail system and the platform surface;
- (b) Screens and mesh:
 - (i) From the top edge of the guardrail system to the scaffold platform; and
 - (ii) Along the entire opening between the supports.
- (c) Intermediate members, such as balusters or additional rails, not more than nineteen inches (48 cm) apart.

(19) The employer must make sure steel or plastic banding is not used as a top rail or midrail.

(20) The employer must have a competent person inspect manila rope and plastic or other synthetic rope that is used as a top rail or midrail as frequently as necessary to make sure it continues to meet the strength requirements for a top rail or midrail.

Note: Crossbraces may be used as a top rail or midrail in a guardrail system if they meet the following requirements:

- 1. The crossing point of the two braces is between:
 - a. 20" and 30" above the work platform when used as a midrail.
 - b. 38" and 48" above the work platform when used as a top rail.
- 2. The end points at each upright are not more than 48" apart.

Additional requirements for scaffolds can be found in chapter 296-874 WAC, Scaffolds.

NEW SECTION

WAC 296-880-30035 Cranes. This section applies to all cranes covered under the scope of chapter 296-155 WAC, Part L, Cranes, rigging, and personnel lifting.

- (1) Fall protection systems:
 - (a) Personal fall arrest systems must conform to the criteria in WAC 296-880-40020.
 - (b) Personal fall restraint systems must conform to the criteria in WAC 296-880-40025.
 - (c) Positioning device systems must conform to the criteria in WAC 296-880-40030.

(2) For nonassembly/disassembly work on cranes/derricks except tower cranes, the employer must provide and ensure the use of fall protection equipment for employees six feet or more above a lower level as follows:

- (a) When moving point-to-point:
 - (i) On nonlattice booms (whether horizontal or not horizontal);
 - (ii) On lattice booms that are not horizontal;
 - (iii) On horizontal lattice booms where the fall distance is ten feet or more above a lower level.
- (b) While at a work station on any part of the crane (including the boom, of any type).

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(3) For assembly/disassembly work on cranes/derricks except tower cranes, the employer must provide and ensure the use of fall protection equipment for employees ten feet or more above a lower level.

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(4) Tower cranes.

(a) For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of fall protection equipment for employees six feet or more above a lower level.

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(b) For erecting, climbing, and dismantling work, the employer must provide and ensure the use of fall protection equipment for employees ten feet or more above a lower level.

(5) Anchorage criteria applicable to all cranes.

(a) Anchorages used for attachment of personal fall arrest equipment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least five thousand pounds (22.2 kN) per employee attached, or must be designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

(ii) Under the supervision of a qualified person.

(b) Positioning devices must be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or three thousand pounds (13.3 kN), whichever is greater.

(c) Anchorages for personal fall arrest and positioning device systems.

(i) Personal fall arrest systems may be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in (a) of this subsection would not be met.

(ii) Positioning device systems may be anchored to any apparently substantial part of the crane unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in (b) of this subsection would not be met.

(iii) Attachable anchor devices (portable anchor devices that are attached to the crane) must meet the anchorage criteria in (a) of this subsection for personal fall arrest systems and (b) of this subsection for positioning device systems.

(d) Anchorages for fall restraint systems. Fall restraint systems may be anchored to any part of the crane that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.

(e) Anchoring to the load line. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met:

(i) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line, and rigging) meets or exceeds the requirements in (a) of this subsection;

(ii) The crane operator must be at the worksite and informed that the crane is being used for this purpose; and

(iii) No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).

(6) Training. The employer must train each employee who may be exposed to fall hazards while on, or hoisted by, cranes/derricks covered by this section in accordance with WAC 296-880-10015.

Additional requirements for cranes can be found in chapter 296-155 WAC, Part L, Cranes, rigging and personnel lifting.

NEW SECTION

WAC 296-880-30040 Telecommunication requirements that apply to wireless. Requirements for telecommunications can be found in chapter 296-32 WAC, Safety standards for telecommunications.

NEW SECTION

WAC 296-880-30045 Ship repairing, shipbuilding and shipbreaking. This section applies to all ship repairing, shipbuilding and ship-breaking industries and operations under the scope of chapter 296-304 WAC, Safety standards for ship repairing, shipbuilding and shipbreaking.

(1) The employer must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than five feet above a solid surface.

(2) Guarding of deck openings and edges.

(a) When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings must be suitably covered or guarded to a height of not less than thirty inches, except where the use of such guards is made impracticable by the work actually in progress.

(b) When employees are working around open hatches not protected by coamings to a height of twenty-four inches or around other large openings, the edge of the opening must be guarded in the working area to a height of thirty-six to forty-two inches, except where the use of such guards is made impracticable by the work actually in progress.

(c) When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than five feet above a solid surface, the edges must be guarded by adequate guardrails meeting the requirements of WAC 296-304-05001 (9)(a) and (b), unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.

(d) When employees are working near the unguarded edges of decks of vessels afloat, they must be protected by buoyant personal flotation devices, meeting the requirements of WAC 296-304-09017(1).

(e) Sections of bilges from which floor plates or gratings have been removed must be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two ten-inch planks placed side by side, or equivalent, must be laid across the opening to provide a safe walking surface.

(f) Gratings, walkways, and catwalks, from which sections or ladders have been removed, must be barricaded with adequate guardrails.

Additional requirements for ship repairing, shipbuilding and shipbreaking can be found in chapter 296-304 WAC, Safety standards for ship repairing, shipbuilding and shipbreaking.

NEW SECTION

WAC 296-880-30050 Longshore, stevedore, and waterfront related operations. This section applies to any and all waterfront operations under the scope of chapter 296-56 WAC, Safety standards—Longshore, stevedore, and waterfront related operations.

(1) The employer must ensure employees doing maintenance work on cranes, spouts or similar types of equipment, eight feet or more above the ground or surface and not in an area that is protected by any standard safeguards such as walkways with standard railings, or ladders with protective cages, wear a full body harness and lanyard which can be attached to the structure.

(2) Guarding of edges. The employer must meet the following requirements for employee protection:

(a) Guardrails must be provided at locations where employees are exposed to falls of more than four feet from floor or wall openings or waterside edges, including bridges or gangway-like structures leading to pilings, vessel mooring or berthing installations.

(b) Guardrails are not required:

(i) At loading platforms and docks;

(ii) At waterside edges used for cargo or mooring line handling;

(iii) On the working sides of work platforms, skids, or similar workplaces which abut the work area; or

(iv) On railroad rolling stock, highway vehicles, intermodal containers, or similar equipment.

(c) Where guardrails are impractical due to machinery requirements or work processes, an alternate means of fall protection, such as nets, must be used.

(3) The employer must ensure guardrails meet the following criteria:

(a) Guardrails must be capable of withstanding a force of at least two hundred pounds (890 N) applied in any direction at mid-span of the top rail (when used), or at the uppermost point if there is no guardrail.

(b) If not of solid baluster, grillwork, slatted, or similar construction, guardrails must consist of top rails and midrails. Midrails, when used, must be positioned at approximately half the height of the top rail.

(c) The top surface of guardrails installed before October 3, 1983, must be at least thirty-six inches (.091 m) high. Those installed after October 3, 1983, must be forty-two inches (1.07 m) high, plus or minus two inches (5.1 cm), high.

(d) Any nonrigid railing such as chain or wire rope must have a maximum sag, at the mid-point between posts, of not more than six inches (15.24 cm).

(e) Top rails must be free of sharp edges and maintained in good repair.

(f) Rail ends must not overhang. This does not prohibit scrollwork, boxed ends or similar nonhazardous projections.

(4) The employer must provide toeboards when employees below could be exposed to falling objects such as tools. Toeboards must be at least three and one-half inches (8.9 cm) in height from top edge to floor level, and be capable of withstanding a force of fifty pounds (222 N) applied in any direction. Drainage clearance not in excess of one-eighth inch under toeboards is permitted.

(5) Stair railings must be capable of withstanding a force of at least two hundred pounds (890 N) applied in any direction, and must not be more than thirty-six inches (0.91 m) nor less than thirty-two inches (0.81 m) in height from the upper top rail surface to the tread surface in line with the leading edge of the tread. Railings and mid-rails must be provided at any stairway having four or more risers, as follows:

(a) For stairways less than forty-four inches (1.12 m) wide, at least one railing; and

(b) For stairways more than forty-four inches (1.12 m) but less than eighty-eight inches (2.24 m) wide, a stair rail or handrail on each side, and if eighty-eight or more inches wide, an additional intermediate handrail.

(6) The employer must maintain railings in good repair and free of sharp edges.

Additional requirements for longshore, stevedore and waterfront related operations can be found in chapter 296-56 WAC, Safety standards for longshore, stevedore and waterfront related operations.

NEW SECTION

WAC 296-880-30055 Ski area facilities and operations. This section applies to all persons, firms, corporations, or others engaged in the operation of organized ski areas and facilities under the scope of chapter 296-59 WAC, Safety standards for ski area facilities and operations.

(1) Personal protective equipment, general requirements.

(a) Personal fall arrest systems or personal fall restraint systems must be provided and used whenever employees are working in locations which expose them to a fall hazard of more than ten feet.

(b) Employees will not be required to wear personal fall protection systems while riding on a standard lift chair while seated in the normal riding position.

(2) Ski lift facilities and structures. Personal fall arrest systems or personal fall restraint systems must be used when working at unprotected elevated locations. Exception to this requirement must only be permitted for emergency rescue or emergency inspection if a personal fall arrest system is not immediately available. Required personal protective equipment must be made available as quickly as possible.

(3) Guardrails on ski lift aerial work platforms.

(a) The platform must be equipped with standard height and strength guardrails where such guardrails will pass through the configuration of all lifts on which it is intended to be used.

(b) Where guardrails must be less than thirty-nine inches high in order to clear carriages, guidage, etc., guardrails must be as high as will clear the obstructions but never less than twelve inches high.

(c) If the work platform is equipped with an upper work level, the upper level platform must be equipped with a toeboard at least four inches high.

(d) Each platform must be equipped with a lanyard attachment ring for each permissible occupant to attach a personal fall arrest system or personal fall restraint system.

(e) Each lanyard attachment ring must be of such strength as to sustain five thousand four hundred pounds of static loading for each occupant permitted to be attached to a specific ring.

(f) Attachment rings must be permanently located as close to the center balance point of the platform as is practical.

(g) The rings may be movable, for instance, up and down a central suspension rod, but must not be completely removable.

(4) Work platform use.

(a) Passengers must be provided with and must use the correct personal fall arrest system or personal fall restraint system for the intended work.

(b) Any time a passenger's position is not protected by a standard guardrail at least thirty-nine inches high, the individual must be protected by a personal fall restraint system, which will not permit free-fall over the platform edge.

(c) When personnel are passengers on a work platform and their work position requires the use of a personal fall arrest or personal fall restraint system, the lanyard must be attached to the work platform, not to the haulrope or tower.

All specifications would be in accordance with WAC 296-880-400.

Additional requirements for ski area facilities and operations can be found in chapter 296-59 WAC, Safety standard for ski area facilities and operations.

NEW SECTION

WAC 296-880-400 Fall protection system specifications. This section applies to all fall protection systems under the scope of this chapter unless specifically addressed in WAC 296-880-300.

NEW SECTION

WAC 296-880-40005 Guardrail systems. Guardrail systems and their use must conform to the following provisions:

(1) A standard guardrail system must consist of top rail, intermediate rail, and posts, and must have a vertical height of thirty-nine to forty-five inches from upper surface of top rail to floor, platform, runway, or ramp level. When conditions warrant, the height of the top edge may exceed the forty-five inch height, provided the

guardrail system meets all other criteria of this subsection. The intermediate rail must be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails must not overhang the terminal posts except where such overhang does not constitute a projection hazard.

(2) Minimum requirements for standard guardrail systems under various types of construction are specified in the following items:

(a) For wood guardrails, the posts must be of at least two-inch by four-inch stock spaced not to exceed eight feet. The top rail must be of at least two-inch by four-inch stock and each length of lumber must be smooth surfaced throughout the length of the guardrail. The intermediate rail must be of at least one-inch by six-inch stock. Other configurations may be used for the top rail when the configuration meets the requirements of (g) of this subsection.

(b) For pipe guardrails, posts and top and intermediate rails must be at least one and one-half inches nominal OD diameter with posts spaced not more than eight feet on centers. Other configurations may be used for the top rail when the configuration meets the requirements of (g) of this subsection.

(c) For structural steel guardrails, posts and top and intermediate rails must be of two-inch by two-inch by three-eighths inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than eight feet on centers. Other configurations may be used for the top rail when the configuration meets the requirements of (g) of this subsection.

(d) For wire rope guardrails, the top and intermediate rails must meet the strength factor and deflection of (g)(ii) of this subsection. The top rail must be flagged at not more than six foot intervals with high visibility material. Posts must be spaced not more than eight feet on centers. The rope must be stretched taut and must 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 (h) of this subsection.

(e) Guardrail systems must be of such construction that the completed structure is capable of withstanding a load of at least two hundred pounds applied within two inches of the top edge, in any outward or downward direction, at any point along the top edge.

(f) When the two hundred pound test load specified in (e) of this subsection is applied in a downward direction, the top edge of the guardrail must not deflect to a height less than thirty-nine inches above the walking/working surface.

(g) Guardrails receiving heavy stresses from employees trucking or handling materials must 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 guardrail construction are acceptable, provided they meet the following conditions:

(i) A smooth surfaced top rail at a height above floor, platform, runway, or ramp level between thirty-nine and forty-five inches;

(ii) When the two hundred pound (890 N) load specified in (e) of this subsection is applied in a downward direction, the top edge of the guardrail must not deflect to a height less than thirty-nine inches (1.0 m) above the walking/working surface. Guardrail system components selected and constructed in accordance with this chapter will be deemed to meet this requirement;

(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 overhang of rail ends unless such overhang does not constitute a hazard.

(3) Toeboard specifications.

(a) A standard toeboard must be a minimum of three and one-half inches in vertical height from the top edge to the level of the walking/working surface. Toeboards may be made of any substantial material, either solid, or with openings not over one inch in greatest dimension. Toeboards must be securely fastened in place with no more than one-quarter inch clearance above the walking/working surface.

(b) Where material is piled to such height that a standard toeboard does not provide protection, paneling, or screening from floor to intermediate rail or to top rail must be provided.

NEW SECTION

WAC 296-880-40010 Ramps, runways, and inclined walkway requirements. Ramps, runways, and inclined walkways must conform to the following provisions:

(1) Be at least eighteen inches wide; and

(2) Not be inclined more than twenty degrees from horizontal and when inclined, they must be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

Note: See WAC 296-880-20005 for guarding ramps, runways, and inclined walkways that are four feet or more above the ground or lower level.

NEW SECTION

WAC 296-880-40015 Cover requirements—Holes and openings. Covers and their use must conform to the following provisions:

(1) Hole covers must be of any material that meets the following strength requirements:

(a) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles must be designed to carry a truck rear axle load of at least two times the maximum intended load;

(b) Hole covers must be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

(2) All covers must be secured when installed so as to prevent accidental displacement by wind, equipment, or employees.

(3) All temporary covers must be color coded or they must be marked with the word "hole" or "cover" to provide warning of the hazard.

(4) Barriers and screens used to cover openings must meet the following requirements:

(a) Barriers must be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least two hundred pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

(b) Screens must be of such construction and mounting that they are capable of withstanding a load of at least two hundred pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of either grill work with openings not more than eight inches long, or of slat work with openings not more than four inches wide with length unrestricted.

NEW SECTION

WAC 296-880-40020 Personal fall arrest system requirements.

Personal fall arrest systems and their use must conform to the following provisions:

(1) Personal fall arrest systems:

(a) A full body harness must be used.

(b) The attachment point of the full body harness must be located in the center of the wearer's back near shoulder level, or above the wearer's head.

(c) Lanyards must have a minimum breaking strength of five thousand pounds (22.2 kN).

(d) The employer must protect all safety lines and lanyards against being cut or abraded.

(e) D-rings and snap hooks must be proof-tested to a minimum tensile load of thirty-six hundred pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(f) Snap hooks must be a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member.

(g) Unless the snap hook is designed for the following connections, snap hooks must not be engaged:

(i) Directly to the webbing, rope, or wire rope;

(ii) To each other;

(iii) To a D-ring to which another snap hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself.

(h) Hardware must be drop forged, pressed or formed steel, or made of materials equivalent in strength.

(i) Hardware must have a corrosion resistant finish, and all surfaces and edges must be smooth to prevent damage to the attached full body harness or lanyard.

(j) All components of full body harness systems whose strength is not otherwise specified in this section must be capable of supporting a minimum fall impact load of five thousand pounds (22.2 kN) applied at the lanyard point of connection.

(k) Vertical lifelines (droplines) must have a minimum breaking strength of five thousand pounds (22.2 kN), except that self-retracting lifelines and lanyards which automatically limit free fall distance to two feet (.61 m) or less must have a minimum breaking strength of three thousand pounds (13.3 kN).

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

(m) Horizontal lifelines must be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

(2) (a) Anchorages for full body harness systems.

(b) Anchorages for full body harness systems must be capable of supporting (per employee):

(i) Three thousand pounds when used in conjunction with:

(A) A self-retracting lifeline that limits the maximum free fall distances to two feet or less; or

(B) A shock absorbing lanyard that restricts the forces on the body to nine hundred pounds or less.

(ii) Five thousand pounds for all other personal fall arrest system applications, or they must be designed, installed, and used:

(A) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

(B) Under the supervision of a qualified person.

Note: The system strength requirements in this section are based on a total combined weight of employee and tools of no more than three hundred ten pounds. If combined weight is more than three hundred ten pounds, appropriate allowances must be made or the system will not be in compliance. For more information on system testing, see WAC 296-880-510 Appendix C.

(3) When stopping a fall, personal fall arrest systems must:

(a) Be rigged to allow a maximum free fall distance of six feet nor allow an employee to contact any lower level. A free fall may be more than six feet provided the employer can demonstrate the manufacturer designed the system to allow a free fall of more than six feet and the system has been tested to ensure a maximum arresting force of eighteen hundred pounds is not exceeded;

(b) Limit maximum arresting force on an employee to eighteen hundred pounds (8 kN);

(c) Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to three and one-half feet (1.08 m); and

(d) Have sufficient strength to withstand twice the potential impact energy of an employee free falling a maximum distance of six feet (1.8 m).

Note: Shock absorbers that meet the requirements of ANSI Z359.1 that are used as a part of a personal fall arrest system in accordance with manufacturer's recommendations and instructions for use and installation will limit the maximum arresting forces on an employee's body to eighteen hundred pounds or less.

To calculate fall clearance distance using a shock absorbing lanyard and D-ring anchorage connector, see WAC 296-880-505 Appendix B.

NEW SECTION

WAC 296-880-40025 Personal fall restraint system requirements.

Personal fall restraint systems and their use must conform to the following provisions.

Personal fall restraint systems must be rigged to allow the movement of employees only as far as the unprotected sides and edges of the walking/working surface, and must consist of:

(1) A full body harness must be used.

(2) The full body harness must be attached to securely rigged restraint lines.

(3) All hardware assemblies for full body harness must be capable of withstanding a tension loading of four thousand pounds without cracking, breaking, or taking a permanent deformation.

(4) The employer must ensure component compatibility.

(5) Anchorage points used for fall restraint must be capable of supporting four times the intended load.

(6) 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.

NEW SECTION

WAC 296-880-40030 Positioning device system requirements. Positioning device systems and their use must conform to the following provisions:

(1) Positioning harnesses or full body harnesses must be used.

(2) Positioning devices must be rigged to prevent an employee from a free fall greater than two feet.

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

(4) Connectors must be drop forged, pressed or formed steel, or made of equivalent materials.

(5) Connectors must have a corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of this system.

(6) Connecting assemblies must have a minimum breaking strength of five thousand pounds (22.2 kN).

(7) D-rings and snap hooks must be proof-tested to a minimum tensile load of three thousand six hundred pounds (16 kN) without cracking, breaking, or taking permanent deformation.

(8) Snap hooks must be a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member.

(9) Unless the snap hook is designed for the following connections, snap hooks must not be engaged:

(a) Directly to webbing, rope, or wire rope;

(b) To each other;

(c) To a D-ring to which another snap hook or other connector is attached;

(d) To a horizontal lifeline; or

(e) To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself.

NEW SECTION

WAC 296-880-40035 Self-rescue device requirements. Self-rescue devices and their use must conform to the following provisions:

- (1) Self-rescue devices are not to be used as a fall protection system.
- (2) Self-rescue devices must be used according to the manufacturer's instructions.
- (3) The use of self-rescue devices must be addressed in the fall protection work plan.

NEW SECTION

WAC 296-880-40040 Warning line system requirements. Warning line systems and their use must conform to the following provisions:

Warning line system specifications used on roofs with a pitch of four in twelve or less for roofing work, leading edge work and on low pitched open sided surfaces for work activities other than roofing work or leading edge work. The employer must ensure the following:

(1) Warning lines must be erected around all unprotected sides and edges of the work area.

(a) Warning lines used during roofing work:

(i) When roofing work is taking place or when mechanical equipment is not being used, the warning line must be erected not less than six feet (1.8 m) from the edge of the roof;

(ii) When mechanical equipment is being used, the warning line must be erected not less than six feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than ten feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(b) Warning lines erected for leading edge work. Warning lines must be erected to separate employees who are engaged in leading edge work (between the forward edge of the warning line and the leading edge), from other work areas on the low pitched surface. The employer must ensure:

(i) The warning line is erected not less than six feet nor more than twenty-five feet from the leading edge; and

(ii) When fall arrest systems as described in WAC 296-880-40020, or fall restraint systems as described in WAC 296-880-40025 are not used, the employer must implement a safety monitor system as described in WAC 296-880-40045 to protect employees engaged in constructing the leading edge who are working between the forward edge of the warning line and the leading edge.

(c) Warning lines erected on low pitched open sided surfaces for work activities other than roofing work, or leading edge work must be erected not less than fifteen feet from the unprotected sides or edges of the open sided surface.

(2) The warning line must consist of a rope, wire, or chain and supporting stanchions erected as follows:

(a) The rope, wire, or chain must be flagged at not more than six foot (1.8 m) intervals with high visibility material. Highly visible caution or danger tape as described in (d) of this subsection, does not need to be flagged.

(b) The rope, wire, or chain must be rigged and supported in such a way that its lowest point (including sag) is no less than thirty-six inches from the surface and its highest point is no more than forty-five inches from the surface.

(c) After being erected, with the rope, wire or chain attached, stanchions must be capable of resisting, without tipping over, a force of at least sixteen pounds (71 N) applied horizontally against the stanchion, thirty inches (0.76 m) above the surface, perpendicular to the warning line, and in the direction of the unprotected sides or edges of the surface.

(d) The rope, wire, or chain must have a minimum tensile strength of five hundred pounds (2.22 kN), and after being attached to the stanchions, must be capable of supporting, without breaking, the loads applied to the stanchions. Highly visible caution or danger tape may be used in lieu of rope, wire, or chain as long as it is at least three inches wide and three mils thick, and has a tensile strength of at least two hundred pounds.

(e) The line must be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(3) The employer must erect access paths as follows:

(a) Points of access, materials handling areas, and storage areas must be connected to the work area by a clear access path formed by two warning lines.

(b) When the path to a point of access is not in use, the employer must place a rope, wire, or chain, equal in strength and height to the warning line, across the path at the point where the path intersects the warning line erected around the work area.

NEW SECTION

WAC 296-880-40045 Safety monitor system requirements. Safety monitor systems and their use must conform to the following provisions:

(1) A safety monitor system may be used in conjunction with a warning line system as a method of fall protection during roofing work on low pitched roofs or leading edge work on low pitched surfaces.

Note: The warning line is not required when performing roofing work on low pitched roofs less than fifty feet wide. For information on determining roof widths, see WAC 296-880-500, Appendix A, Determining roof widths.

(2) When selected, the employer must ensure that the safety monitor system is addressed in the fall protection work plan, including the name of the safety monitor(s) and the extent of their training in both the safety monitor and warning line systems. The employer must ensure that the following requirements are met:

(a) The safety monitor system must not be used when adverse weather conditions create additional hazards.

(b) Employees working outside of the warning line system, (between the forward edge of the warning line and the unprotected sides or edges of a low pitched surface), must be readily distinguishable from other members of the crew that are working inside the warning line system by wearing highly visible, distinctive, and uniform apparel.

(c) Employees must promptly comply with fall hazard warnings from the safety monitor.

(d) The employer must train a person acting in the capacity of safety monitor(s) in the function of both the safety monitor and warning line systems, and they must:

- (i) Be a competent person as defined in WAC 296-880-095;
- (ii) Have control authority over the work as it relates to fall protection;
- (iii) Be instantly distinguishable over members of the work crew;
- (iv) Perform no other duties while acting as safety monitor;
- (v) Be positioned in relation to the workers under their protection, so as to have a clear, unobstructed view and be able to maintain normal voice communication;
- (vi) Not supervise more than eight exposed workers at one time; and
- (vii) Warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner.

NEW SECTION

WAC 296-880-40050 Safety watch system requirements. Safety watch systems and their use must conform to the following provisions:

(1) When one employee is conducting any repair work or servicing equipment on a low pitch roof, not within six feet of the edge, and where exposure to falls is infrequent (not on a predictable and regular basis), employers are allowed to use a safety watch system.

(2) The employer must ensure the safety watch system meets the following requirements:

(a) There can only be two people on the roof while the safety watch system is being used: One employee acting as the safety watch and one employee engaged in the repair work or servicing equipment;

(b) The employee performing the repair work or service must comply promptly with fall hazard warnings from the safety watch;

(c) Mechanical equipment is not used; and

(d) The safety watch system is not used when weather conditions create additional hazards.

(3) The employer must ensure the employee acting as the safety watch meets all of the following:

(a) Is a competent person as defined in WAC 296-880-095;

(b) Is trained in the requirements of this section;

(c) Has full control over the work as it relates to fall protection;

(d) Has a clear, unobstructed view of the worker;

(e) Is able to maintain normal voice communication; and

(f) Performs no other duties while acting as the safety watch.

NEW SECTION

WAC 296-880-40055 Safety net system requirements. Safety net systems and their use must conform with the following provisions:

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

(2) Safety nets must extend outward from the outermost projection of the work surface as follows:

Table 2

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

(3) The employer must install safety nets 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 in subsection (5) of this section.

(4) Safety nets and their installations must be capable of absorbing an impact force equal to that produced by the drop test.

(a) Except as provided in subsection (6) of this section, safety nets and safety net installations must 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 six-month intervals if left in one place. The drop-test must consist of a four hundred pound (180 kg) bag of sand, thirty plus or minus two inches (76 plus or minus 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 forty-two inches (1.1 m) above that level.

(b) When the employer can demonstrate that it is unreasonable to perform the drop-test required by (a) of this subsection, the employer (or a designated competent person) must certify that the net and net installation is in compliance with subsections (2) and (3) of this section 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 with subsection (5) of this section and the signature of the person making the determination and certification. The most recent certification record for each net and net installation must be available at the job site for inspection.

(5) The employer must inspect safety nets at a minimum of once a week for wear, damage, and other deterioration. Defective components must be removed from service. Safety nets must also be inspected after any occurrence which could affect the integrity of the safety net system.

(6) The employer must remove materials, scrap pieces, equipment, and tools which have fallen into the safety net as soon as possible from the net and at least before the next work shift.

(7) The maximum size of each safety net mesh opening must not exceed thirty-six square inches (230 cm²) nor be longer than six inches (15 cm) on any side, and the opening, measured center-to-center of mesh ropes or webbing, must not be longer than six inches (15 cm). All mesh crossings must be secured to prevent enlargement of the mesh opening.

(8) Each safety net (or section of it) must have a border rope or webbing with a minimum breaking strength of five thousand pounds (22.2 kN).

(9) Connections between safety net panels must be as strong as integral net components and must be spaced not more than six inches (15 cm) apart.

NEW SECTION

WAC 296-880-40060 Catch platform requirements. Catch platforms and their use must comply with the following provisions:

(1) Catch platforms must be installed within four vertical feet of the work area.

(2) Catch platforms must be a minimum of forty-five inches wide and equipped with standard guardrails and toeboards on all open sides.

(3) Catch platforms must meet the strength and stability requirements of supported scaffolds in chapter 296-874 WAC, Scaffolds.

NEW SECTION

WAC 296-880-40065 Canopy requirements. Canopies and their use must comply with the following provision: Canopies, when used as falling object protection, must be of sufficient strength to prevent collapse and to prevent penetration by any objects which may fall onto the canopy.

NEW SECTION

WAC 296-880-40070 Roof bracket requirements. Roof brackets and their use must comply with the following provisions: Roofing brackets are not a fall protection system.

(1) Roofing brackets must be constructed to fit the pitch of the roof.

(2) In addition to securing brackets using the pointed metal projections, brackets must also be secured in place by nailing. When it is impractical to nail brackets, rope supports must be used. When rope supports are used, they must consist of first grade manila of at least three-quarter inch diameter, or equivalent.

NEW SECTION

WAC 296-880-40075 Crawling board and chicken ladder requirements. Crawling boards, chicken ladders, and their use must conform with the following provisions: Crawling boards and chicken ladders are not fall protection systems.

(1) Crawling boards must be not less than ten inches wide and one inch thick, having cleats one by one and one-half inches:

(a) The cleats must be equal in length to the width of the board and spaced at equal intervals not to exceed twenty-four inches.

(b) Nails must be driven through and clinched on the underside.

(c) The crawling board must extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(2) Crawling boards must be secured to the roof using ridge hooks or other equivalent means.

NEW SECTION

WAC 296-880-40080 Roof edge materials handling and material storage requirements. Roof edge materials handling areas and materials storage must conform with the following provisions:

(1) When guardrails are used at hoisting areas, a minimum of four feet of guardrail must be erected along each side of the access point through which materials are hoisted.

(2) A chain or gate must be placed across the opening between the guardrail sections when hoisting operations are not taking place.

(3) When guardrails are used at bitumen pipe outlet, a minimum of four feet of guardrail must be erected along each side of the pipe.

(4) Mechanical equipment must be used or stored only in areas where employees are protected using a fall arrest system as described in WAC 296-880-40020, or a fall restraint system as described in WAC 296-880-40025. Mechanical equipment may not be used or stored where the only protection is provided by the use of a safety monitor.

(5) The hoist must not be used as an attachment/anchorage point for fall arrest or fall restraint systems.

(6) Materials must not be stored within six feet of a roof edge unless guardrails are erected at the roof edge. Guardrails must include a toeboard if employees could be working or passing below.

NONMANDATORY APPENDICES

NEW SECTION

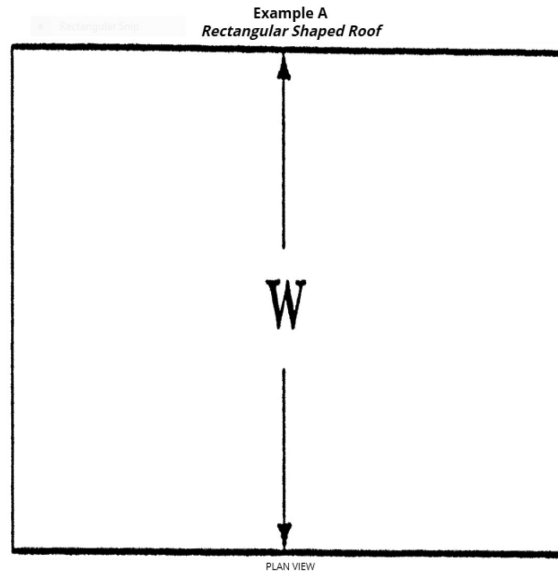
WAC 296-880-500 Appendix A—Determining roof widths—Nonmandatory guidelines. Guidelines for complying with fall restraint requirements in this section.

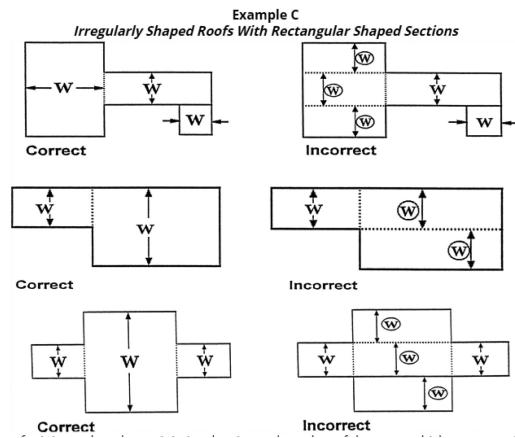
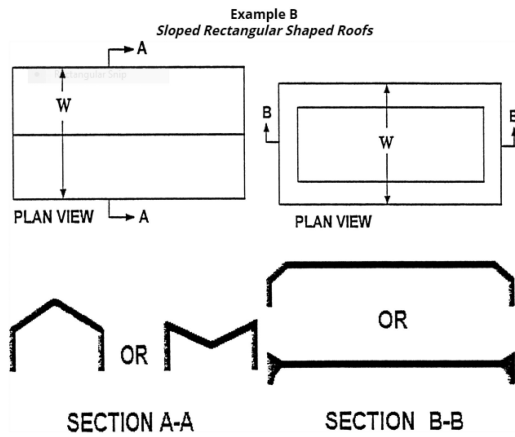
(1) This appendix serves as a guideline to assist employers complying with the requirements of WAC 296-880-40045 which allows the use of a safety monitoring system alone as a means of providing fall pro-

tection during the performance of roofing operations on low sloped roofs fifty feet (15.25 m) or less in width. Each example in the appendix shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs divided into smaller, regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area, as viewed from above. Example A shows a simple rectangular roof. The width is the lesser of the two primary overall dimensions, which is also the case with roofs sloped toward or away from the roof center, as shown in Example B.

(2) Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than fifty feet (15.25 m) wide. The intent is to minimize the number of roof areas where safety monitoring systems alone are sufficient protection.

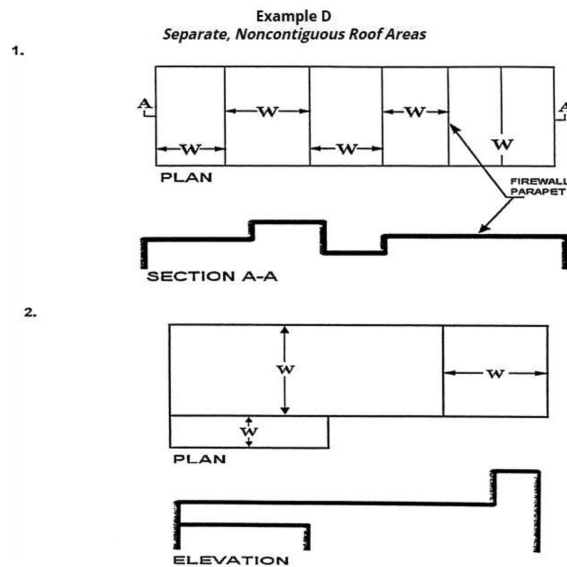
(3) Roofs which are comprised of several separate, noncontiguous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features, Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, nonrectangular roofs must be considered on an individual basis, as shown in Example F.

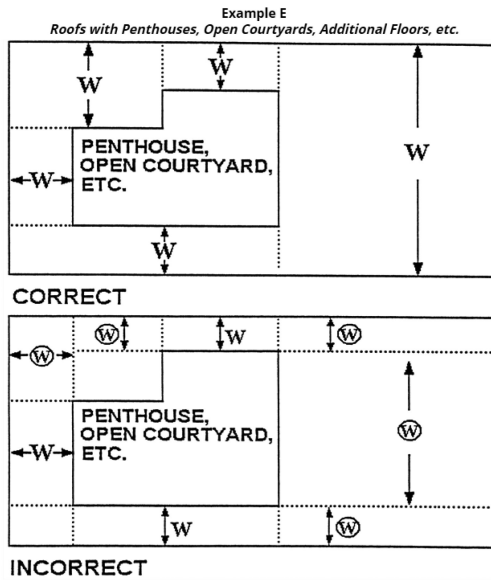




Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to fifty feet (15.25 m) in width, in order to limit the size of roof areas where the safety monitoring system alone can be used (WAC 296-880-40045(1)). Dotted lines are used in the examples to show the location of dividing lines.

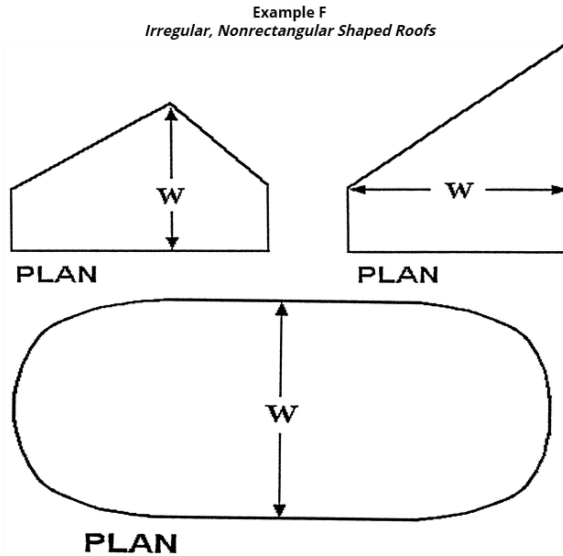
Ⓜ denotes incorrect measurements of width.





Such roofs are to be divided into subareas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to fifty feet (15.25 m) in width in order to limit the size of roof areas where the safety monitoring system alone can be used. Dotted lines are used in the examples to show the location of dividing lines.

Ⓜ denotes incorrect measurements of width.



NEW SECTION

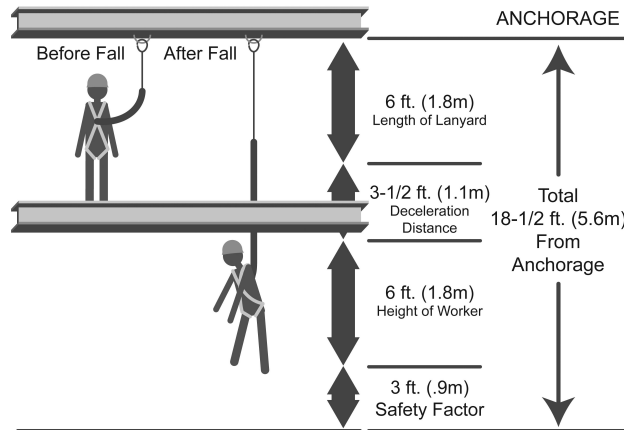
WAC 296-880-505 Appendix B—Calculating fall clearance distance—Nonmandatory guidelines. Calculating fall clearance distance using a shock-absorbing lanyard and D-ring anchorage connector - Nonmandatory guidelines for complying with WAC 296-880-40020.

Do the following to calculate the fall clearance distance using a shock-absorbing lanyard and D-ring anchorage connector:

(1) First, add the length of the shock-absorbing lanyard (six feet) to the maximum elongation of the shock absorber during deceleration (three and one-half feet) to the average height of a worker (six feet);

(2) Then, add a safety factor of three feet to allow for the possibility of an improperly fit full body harness, a taller than average worker and/or a miscalculation of distance.

Note: The suggested safe fall clearance distance for this example is eighteen and one-half feet.



NEW SECTION

WAC 296-880-510 Appendix C—Test methods and additional guidelines for personal fall arrest systems—Nonmandatory guidelines. (1) General. Subsections (2), (3), (4), and (5) of this appendix set forth test procedures which may be used to determine compliance with the requirements in WAC 296-880-40020.

(2) General conditions for all tests.

(a) Lifelines, lanyards, and deceleration devices should be attached to an anchorage and connected to the body harness in the same manner as they would be when used to protect employees.

(b) The anchorage should be rigid, and should not have a deflection greater than .04 inches (1 mm) when a force of two thousand two hundred fifty pounds (10 kN) is applied.

(c) The frequency response of the load measuring instrumentation should be 120 Hz.

(d) The test weight used in the strength and force tests should be a rigid, metal, cylindrical or torso-shaped object with a girth of thirty-eight inches plus or minus four inches (96 cm plus or minus 10 cm).

(e) The lanyard or lifeline used to create the free fall distance should be supplied with the system, or in its absence, the least elastic lanyard or lifeline available to be used with the system.

(f) The test weight for each test should be hoisted to the required level and should be quickly released without having any appreciable motion imparted to it.

(g) The system's performance should be evaluated taking into account the range of environmental conditions for which it is designed to be used.

(h) Following the test, the system need not be capable of further operation.

(3) Strength test.

(a) During the testing of all systems, a test weight of three hundred pounds plus or minus five pounds (135 kg plus or minus 2.5 kg) should be used. (See subsection (2)(d) of this appendix.)

(b) The test consists of dropping the test weight once. A new unused system should be used for each test.

(c) For lanyard systems, the lanyard length should be six feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body harness.

(d) For rope-grab-type deceleration systems, the length of the lifeline above the centerline of the grabbing mechanism to the lifeline's anchorage point should not exceed two feet (0.61 m).

(e) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to two feet (0.61 m) or less, and for systems with deceleration devices which have a connection distance in excess of one foot (0.3 m) (measured between the centerline of the lifeline and the attachment point to the body harness), the test weight should be rigged to free fall a distance of seven and one-half feet (2.3 m) from a point that is one and one-half feet (46 cm) above the anchorage point, to its hanging location (six feet below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or ground during the test. In some cases a nonelastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(f) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m) or less, the test weight should be rigged to free fall a distance of four feet (1.22 m).

(g) Any weight which detaches from the harness should constitute failure for the strength test.

(4) Force test.

(a) General. The test consists of dropping the respective test weight specified in (b)(i) or (c)(i) of this subsection once. A new, unused system should be used for each test.

(b) For lanyard systems:

(i) A test weight of two-hundred twenty pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) should be used. (See subsection (2)(d) of this section.)

(ii) Lanyard length should be six feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body harness.

(iii) The test weight should fall free from the anchorage level to its hanging location (a total of six feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(c) For all other systems:

(i) A test weight of two hundred and twenty pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) should be used. (See subsection (2)(d) of this section.)

(ii) The free fall distance to be used in the test should be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of six feet (1.83 m), except as follows:

(A) For deceleration systems which have a connection link or lanyard, the test weight should free fall a distance equal to the connection distance (measured between the centerline of the lifeline and the attachment point to the body harness).

(B) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m) or less, the test weight should free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight should be supported and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured.)

(d) A system fails the force test if the recorded maximum arresting force exceeds two thousand five hundred pounds (11.2 kN) when using a body harness.

(e) The maximum elongation and deceleration distance should be recorded during the force test.

(5) Deceleration device tests.

(a) General. The device should be evaluated or tested under the environmental conditions, (such as rain, ice, grease, dirt, type of lifeline, etc.), for which the device is designed.

(b) Rope-grab-type deceleration devices.

(i) Devices should be moved on a lifeline one thousand times over the same length of line a distance of not less than one foot (30.5 cm), and the mechanism should lock each time.

(ii) Unless the device is permanently marked to indicate the type(s) of lifeline which must be used, several types (different diameters and different materials), of lifelines should be used to test the device.

(c) Other self-activating-type deceleration devices. The locking mechanisms of other self-activating-type deceleration devices designed for more than one arrest should lock each of one thousand times as they would in normal service.

Additional nonmandatory guidelines for personal fall arrest systems. The following information constitutes additional guidelines for use in complying with requirements for a personal fall arrest system.

(6) Selection and use considerations. The kind of personal fall arrest system selected should match the particular work situation, and any possible free fall distance should be kept to a minimum. Consideration should be given to the particular work environment. For example, the presence of acids, dirt, moisture, oil, grease, etc., and their effect on the system, should be evaluated. Hot or cold environments may also have an adverse effect on the system. Wire rope should not be used where an electrical hazard is anticipated. As required by the standard, the employer must plan to have means available to promptly rescue an employee should a fall occur, since the suspended employee may not be able to reach a work level independently.

Where lanyards, connectors, and lifelines are subject to damage by work operations such as welding, chemical cleaning, and sandblasting, the component should be protected, or other securing systems should be used. The employer should fully evaluate the work conditions and environment (including seasonal weather changes) before selecting the appropriate personal fall protection system. Once in use, the system's effectiveness should be monitored. In some cases, a program for cleaning and maintenance of the system may be necessary.

(7) Testing considerations. Before purchasing or putting into use a personal fall arrest system, an employer should obtain from the sup-

plier information about the system based on its performance during testing so that the employer can know if the system meets this standard. Testing should be done using recognized test methods. Part II of this Appendix C contains test methods recognized for evaluating the performance of fall arrest systems. Not all systems may need to be individually tested; the performance of some systems may be based on data and calculations derived from testing of similar systems, provided that enough information is available to demonstrate similarity of function and design.

(8) Component compatibility considerations. Ideally, a personal fall arrest system is designed, tested, and supplied as a complete system. However, it is common practice for lanyards, connectors, lifelines, deceleration devices, and body harnesses to be interchanged since some components wear out before others. The employer and employee should realize that not all components are interchangeable. For instance, a lanyard should not be connected between a body harness and a deceleration device of the self-retracting type since this can result in additional free fall for which the system was not designed. Any substitution or change to a personal fall arrest system should be fully evaluated or tested by a competent person to determine that it meets the standard, before the modified system is put in use.

(9) Employee training considerations. Thorough employee training in the selection and use of personal fall arrest systems is imperative. As stated in the standard, before the equipment is used, employees must be trained in the safe use of the system. This should include the following:

- (a) Application limits;
- (b) Proper anchoring and tie-off techniques;
- (c) Estimation of free fall distance, including determination of deceleration distance, and total fall distance to prevent striking a lower level;
- (d) Methods of use; and
- (e) Inspection and storage of the system.

Careless or improper use of the equipment can result in serious injury or death. Employers and employees should become familiar with the material in this appendix, as well as manufacturer's recommendations, before a system is used. Of uppermost importance is the reduction in strength caused by certain tie-offs (such as using knots, tying around sharp edges, etc.) and maximum permitted free fall distance. Also, to be stressed are the importance of inspections prior to use, the limitations of the equipment, and unique conditions at the worksite which may be important in determining the type of system to use.

(10) Instruction considerations. Employers should obtain comprehensive instructions from the supplier as to the system's proper use and application, including, where applicable:

- (a) The force measured during the sample force test;
- (b) The maximum elongation measured for lanyards during the force test;
- (c) The deceleration distance measured for deceleration devices during the force test;
- (d) Caution statements on critical use limitations;
- (e) Application limits;
- (f) Proper hook-up, anchoring and tie-off techniques, including the proper D-ring or other attachment point to use on the body harness for fall arrest;
- (g) Proper climbing techniques;

(h) Methods of inspection, use, cleaning, and storage; and

(i) Specific lifelines which may be used. This information should be provided to employees during training.

(11) Inspection considerations. As stated in WAC 296-880-40020, personal fall arrest systems must be regularly inspected. Any component with any significant defect, such as cuts, tears, abrasions, mold, or undue stretching; alterations or additions which might affect its efficiency; damage due to deterioration; contact with fire, acids, or other corrosives; distorted hooks or faulty hook springs; tongues unfitted to the shoulder of buckles; loose or damaged mountings; non-functioning parts; or wearing or internal deterioration in the ropes must be withdrawn from service immediately, and should be tagged or marked as unusable, or destroyed.

(12) Rescue considerations. As required by WAC 296-880-10005 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 which allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices which have descent capability.

(13) Tie-off considerations.

(a) One of the most important aspects of personal fall protection systems is fully planning the system before it is put into use. Probably the most overlooked component is planning for suitable anchorage points. Such planning should ideally be done before the structure or building is constructed so that anchorage points can be incorporated during construction for use later for window cleaning or other building maintenance. If properly planned, these anchorage points may be used during construction, as well as afterwards.

(b) Employers and employees should at all times be aware that the strength of a personal fall arrest system is based on its being attached to an anchoring system which does not significantly reduce the strength of the system (such as a properly dimensioned eye-bolt/snap-hook anchorage). Therefore, if a means of attachment is used that will reduce the strength of the system, that component should be replaced by a stronger one, but one that will also maintain the appropriate maximum arrest force characteristics.

(c) Tie-off using a knot in a rope lanyard or lifeline (at any location) can reduce the lifeline or lanyard strength by fifty percent or more. Therefore, a stronger lanyard or lifeline should be used to compensate for the weakening effect of the knot, or the lanyard length should be reduced (or the tie-off location raised) to minimize free fall distance, or the lanyard or lifeline should be replaced by one which has an appropriately incorporated connector to eliminate the need for a knot.

(d) Tie-off of a rope lanyard or lifeline around an "H" or "I" beam or similar support can reduce its strength as much as seventy percent due to the cutting action of the beam edges. Therefore, use should be made of a webbing lanyard or wire core lifeline around the beam; or the lanyard or lifeline should be protected from the edge; or free fall distance should be greatly minimized.

(e) Tie-off where the line passes over or around rough or sharp surfaces reduces strength drastically. Such a tie-off should be avoided or an alternative tie-off rigging should be used. Such alternatives may include use of a snap-hook/D-ring connection, wire rope tie-

off, an effective padding of the surfaces, or an abrasion-resistance strap around or over the problem surface.

(f) Horizontal lifelines may, depending on their geometry and angle of sag, be subjected to greater loads than the impact load imposed by an attached component. When the angle of horizontal lifeline sag is less than thirty degrees, the impact force imparted to the lifeline by an attached lanyard is greatly amplified. For example, with a sag angle of fifteen degrees, the force amplification is about 2:1 and at five degrees sag, it is about 6:1. Depending on the angle of sag, and the line's elasticity, the strength of the horizontal lifeline and the anchorages to which it is attached should be increased a number of times over that of the lanyard. Extreme care should be taken in considering a horizontal lifeline for multiple tie-offs. The reason for this is that in multiple tie-offs to a horizontal lifeline, if one employee falls, the movement of the falling employee and the horizontal lifeline during arrest of the fall may cause other employees to also fall. Horizontal lifeline and anchorage strength should be increased for each additional employee to be tied-off. For these and other reasons, the design of systems using horizontal lifelines must only be done by qualified persons. Testing of installed lifelines and anchors prior to use is recommended.

(g) The strength of an eye-bolt is rated along the axis of the bolt and its strength is greatly reduced if the force is applied at an angle to this axis (in the direction of shear). Also, care should be exercised in selecting the proper diameter of the eye to avoid accidental disengagement of snap-hooks not designed to be compatible for the connection.

(h) Due to the significant reduction in the strength of the lifeline/lanyard (in some cases, as much as a seventy percent reduction), the sliding hitch knot should not be used for lifeline/lanyard connections except in emergency situations where no other available system is practical. The "one-and-one" sliding hitch knot should never be used because it is unreliable in stopping a fall. The "two-and-two," or "three-and-three" knot (preferable), may be used in emergency situations; however, care should be taken to limit free fall distance to a minimum because of reduced lifeline/lanyard strength.

(14) Vertical lifeline considerations. As required by the standard, each employee must have a separate lifeline when the lifeline is vertical. The reason for this is that in multiple tie-offs to a single lifeline, if one employee falls, the movement of the lifeline during the arrest of the fall may pull other employees' lanyards, causing them to fall as well.

(15) Snap-hook considerations.

(a) Required by this standard for all connections, locking snap-hooks incorporate a positive locking mechanism in addition to the spring loaded keeper, which will not allow the keeper to open under moderate pressure without someone first releasing the mechanism. Such a feature, properly designed, effectively prevents roll-out from occurring.

(b) As required by WAC 296-880-40020 the following connections must be avoided (unless properly designed locking snap-hooks are used) because they are conditions which can result in roll-out when a non-locking snap-hook is used:

- (i) Direct connection of a snap-hook to a horizontal lifeline;
- (ii) Two (or more) snap-hooks connected to one D-ring;
- (iii) Two snap-hooks connected to each other;
- (iv) A snap-hook connected back on its integral lanyard;

(v) A snap-hook connected to a webbing loop or webbing lanyard;

(vi) Improper dimensions of the D-ring, rebar, or other connection point in relation to the snap-hook dimensions which would allow the snap-hook keeper to be depressed by a turning motion of the snap-hook.

(16) Free fall considerations. The employer and employee should at all times be aware that a system's maximum arresting force is evaluated under normal use conditions established by the manufacturer, and in no case using a free fall distance in excess of six feet (1.8 m). A few extra feet of free fall can significantly increase the arresting force on the employee, possibly to the point of causing injury. Because of this, the free fall distance should be kept at a minimum, and as required by the standard, in no case greater than six feet (1.8 m). To help assure this, the tie-off attachment point to the lifeline or anchor should be located at or above the connection point of the fall arrest equipment to harness. (Since otherwise additional free fall distance is added to the length of the connecting means (i.e., lanyard).) Attaching to the working surface will often result in a free fall greater than six feet (1.8 m). For instance, if a six foot (1.8 m) lanyard is used, the total free fall distance will be the distance from the working level to the body harness attachment point plus the six feet (1.8 m) of lanyard length. Another important consideration is that the arresting force which the fall system must withstand also goes up with greater distances of free fall, possibly exceeding the strength of the system.

(17) Elongation and deceleration distance considerations. Other factors involved in a proper tie-off are elongation and deceleration distance. During the arresting of a fall, a lanyard will experience a length of stretching or elongation, whereas activation of a deceleration device will result in a certain stopping distance. These distances should be available with the lanyard or device's instructions and must be added to the free fall distance to arrive at the total fall distance before an employee is fully stopped. The additional stopping distance may be very significant if the lanyard or deceleration device is attached near or at the end of a long lifeline, which may itself add considerable distance due to its own elongation. As required by the standard, sufficient distance to allow for all of these factors must also be maintained between the employee and obstructions below, to prevent an injury due to impact before the system fully arrests the fall. In addition, a minimum of twelve feet (3.7 m) of lifeline should be allowed below the securing point of a rope-grab-type deceleration device, and the end terminated to prevent the device from sliding off the lifeline. Alternatively, the lifeline should extend to the ground or the next working level below. These measures are suggested to prevent the worker from inadvertently moving past the end of the lifeline and having the rope grab become disengaged from the lifeline.

(18) Obstruction considerations. The location of the tie-off should also consider the hazard of obstructions in the potential fall path of the employee. Tie-offs which minimize the possibilities of exaggerated swinging should be considered.

(19) Other considerations. Because of the design of some personal fall arrest systems, additional considerations may be required for proper tie-off. For example, heavy deceleration devices of the self-retracting type should be secured overhead in order to avoid the weight of the device having to be supported by the employee. Also, if self-retracting equipment is connected to a horizontal lifeline, the sag in the lifeline should be minimized to prevent the device from

sliding down the lifeline to a position which creates a swing hazard during fall arrest. In all cases, manufacturer's instructions should be followed.

REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 296-24-88050 Appendix C—Personal fall arrest system
(Part I—Mandatory; Parts II and III—
Nonmandatory).

WAC 296-45-25510 Fall protection. (1) Personal fall arrest systems must meet the requirements of chapter ((296-155 WAC, Part C-1, ~~Fall protection requirements for construction~~)) 296-880 WAC, Unified safety standards for fall protection.

(2) Personal fall arrest equipment used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under WAC 296-45-325(13), must be capable of passing a drop test equivalent to that required by subsection (3)(1) of this section after exposure to an electric arc with a heat energy of 40 ± 5 cal/cm².

(3) Body belts and positioning straps for work-positioning equipment must meet the following requirements:

(a) Hardware for body belts and positioning straps must meet the following requirements:

(i) Hardware must be made of drop-forged steel, pressed steel, formed steel, or equivalent material.

(ii) Hardware must have a corrosion-resistant finish.

(iii) Hardware surfaces must be smooth and free of sharp edges.

(b) Buckles must be capable of withstanding an 8.9 kilonewton (2,000 pound-force) tension test with a maximum permanent deformation no greater than 0.4 millimeters (0.0156 inches).

(c) D-rings must be capable of withstanding a 22 kilonewton (5,000 pound-force) tensile test without cracking or breaking.

(d) Snaphooks must be capable of withstanding a 22 kilonewton (5,000 pound-force) tension test without failure.

Note: Distortion of the snaphook sufficient to release the keeper is considered to be tensile failure of a snaphook.

(e) Top grain leather or leather substitute may be used in the manufacture of body belts and positioning straps; however, leather and leather substitutes cannot be used alone as a load-bearing component of the assembly.

(f) Plyed fabric used in positioning straps and in load-bearing parts of body belts must be constructed in such a way that no raw edges are exposed and the plies do not separate.

(g) Positioning straps must be capable of withstanding the following tests:

(i) A dielectric test of 819.7 volts, AC, per centimeter (25,000 volts per foot) for three minutes without visible deterioration;

(ii) A leakage test of 98.4 volts, AC, per centimeter (3,000 volts per foot) with a leakage current of no more than 1 mA;

Note: Positioning straps that pass direct-current tests at equivalent voltages are considered as meeting this requirement.

(iii) Tension tests of 20 kilonewtons (4,500 pounds-force) for sections free of buckle holes and of 15 kilonewtons (3,500 pounds-force) for sections with buckle holes;

(iv) A buckle-tear test with a load of 4.4 kilonewtons (1,000 pounds-force); and

(v) A flammability test in accordance with Table 1.

Table 1 - Flammability Test

Test Method	Criteria for Passing the Test
Vertically suspend a 500 mm (19.7 inch) length of strapping supporting a 100 kg (220.5 lb) weight.	Any flames on the positioning strap must self-extinguish. The positioning strap must continue to support the 100 kg (220.5 lb) mass.
Use a butane or propane burner with a 76 mm (3 inch) flame.	
Direct the flame to an edge of the strapping at a distance of 25 mm (1 inch).	
Remove the flame after 5 seconds.	
Wait for any flames on the positioning strap to stop burning.	

(h) The cushion part of the body belt must contain no exposed rivets on the inside and must be at least 76 millimeters (3 inches) in width.

(i) Tool loops must be situated on the body of a body belt so that the 100 millimeters (4 inches) of the body belt that is in the center of the back, measuring from D-ring to D-ring, is free of tool loops and any other attachments.

(j) Copper, steel, or equivalent liners must be used around the bars of D-rings to prevent wear between these members and the leather or fabric enclosing them.

(k) Snaphooks must be of the locking type meeting the following requirements:

(i) The locking mechanism must first be released, or a destructive force must be placed on the keeper, before the keeper will open.

(ii) A force in the range of 6.7 N (1.5 lbf) to 17.8 N (4 lbf) must be required to release the locking mechanism.

(iii) With the locking mechanism released and with a force applied on the keeper against the face of the nose, the keeper cannot begin to open with a force of 11.2 N (2.5 lbf) or less and must begin to open with a maximum force of 17.8 N (4 lbf).

(l) Body belts and positioning straps must be capable of withstanding a drop test as follows:

(i) The test mass must be rigidly constructed of steel or equivalent material with a mass of 100 kg (220.5 lbf). For work-positioning equipment used by employees weighing more than 140 kg (310 lbf) fully equipped, the test mass must be increased proportionately (that is, the test mass must equal the mass of the equipped worker divided by 1.4).

(ii) For body belts, the body belt must be fitted snugly around the test mass and must be attached to the test-structure anchorage point by means of a wire rope.

(iii) For positioning straps, the strap must be adjusted to its shortest length possible to accommodate the test and connected to the test-structure anchorage point at one end and to the test mass on the other end.

(iv) The test mass must be dropped an unobstructed distance of 1 meter (39.4 inches) from a supporting structure that will sustain minimal deflection during the test.

(v) Body belts must successfully arrest the fall of the test mass and must be capable of supporting the mass after the test.

(vi) Positioning straps must successfully arrest the fall of the test mass without breaking, and the arrest force cannot exceed 17.8 kilonewtons (4,000 pounds-force). Additionally, snaphooks on positioning straps cannot distort to such an extent that the keeper would release.

Note: When used by employees weighing no more than 140 kg (310 lbm) fully equipped, body belts and positioning straps that conform to American Society of Testing and Materials *Standard Specifications for Personal Climbing Equipment*, ASTM F887-12^{e1}, are deemed to be in compliance with (l) of this subsection.

(4) The following requirements apply to the care and use of personal fall protection equipment.

(a) Work-positioning equipment must be inspected before use each day to determine that the equipment is in safe working condition. Work-positioning equipment that is not in safe working condition must not be used.

Note: Work-Positioning Equipment Inspection Guidelines are located in Appendix E of this chapter.

(b) Personal fall arrest systems must be used in accordance with chapter ((~~296-155 WAC, Part C-1~~)) 296-880 WAC, Unified safety standards for fall protection.

Note: Fall protection equipment rigged to arrest falls is considered a fall arrest system and must meet the applicable requirements for the design and use of those systems. Fall protection equipment rigged for work positioning is considered work-positioning equipment and must meet the applicable requirements for the design and use of that equipment.

(c) The employer must ensure that employees use fall protection systems as follows:

(i) Each employee working from an aerial lift must use a fall restraint system or a personal fall arrest system.

(ii) Except as provided in (c)(iii) of this subsection, each employee in elevated locations more than 1.2 meters (4 feet) above the ground on poles, towers, or similar structures must use a personal fall arrest system, work-positioning equipment, or fall restraint system, as appropriate, if the employer has not provided other fall protection meeting chapter ((~~296-155 WAC, Part C-1~~)) 296-880 WAC, Unified safety standards for fall protection.

(iii) Each qualified electrical employee climbing or changing location on poles, towers, or similar structures must use fall protection equipment unless the employer can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.

Notes: • These subsections apply to structures that support overhead electric power transmission and distribution lines and equipment. They do not apply to portions of buildings, such as loading docks, or to electric equipment, such as transformers and capacitors. Chapter ((~~296-155 WAC, Part C-1~~)) 296-880 WAC, Unified safety standards for fall protection contains the duty to provide fall protection associated with walking and working surfaces.

• Until the employer ensures that employees are proficient in climbing and the use of fall protection under WAC 296-45-065(8), the employees are not considered "qualified electrical employees" for the purposes of (c)(ii) and (iii) of this subsection. These subsections require unqualified employees (including trainees) to use fall protection any time they are more than 1.2 meters (4 feet) above the ground.

(d) Work-positioning systems must be rigged so that an employee can free fall no more than 0.6 meters (2 feet).

(e) Anchorages for work-positioning equipment must be capable of supporting at least twice the potential impact load of an employee's fall, or 13.3 kilonewtons (3,000 pounds-force), whichever is greater.

Note: Wood-pole fall-restriction devices meeting American Society of Testing and Materials *Standard Specifications for Personal Climbing Equipment*, ASTM F887-12^{e1}, are deemed to meet the anchorage-strength requirement when they are used in accordance with manufacturers' instructions.

(f) Unless the snaphook is a locking type and designed specifically for the following connections, snaphooks on work-positioning equipment must not be engaged:

(i) Directly to webbing, rope, or wire rope;

(ii) To each other;

(iii) To a D-ring to which another snaphook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that accidental disengagement could occur should the connected object sufficiently depress the snaphook keeper to allow release of the object.

(5) Employees must not wear climbers while doing work where they are not required. Employees must not continue to wear their climbers while working on the ground; except for momentary or short periods of time on the ground.

(6) Employees, when working from a hook ladder, must either belt themselves securely to the ladder, attach themselves to the structures by means of a safety line, or belt themselves to ladder safety equipment, which must consist of a safety rope or belting threaded through the rungs or secured to the ladder at intervals of not more than three feet.

(7) Before an employee throws their weight on a belt, the employee must determine that the snap or fasteners are properly engaged.

(8) Safety straps must not be placed around poles above the cross-arm except where it is not possible for the strap to slide or be slipped over the top of the pole by inadvertence of the employee. Neither end of the strap must be allowed to hang loose or dangle while the employee is ascending or descending poles or other structures.

(9) Body belts and safety straps must not be stored with sharp-edged tools or near sharp objects. When a body belt, safety strap and climbers are kept in the same container, they must be stored in such a manner as to avoid cutting or puncturing the material of the body belt or safety strap with the gaffs or climbers.

(10) Employees must not attach metal hooks or other metal devices to body belts. Leather straps or rawhide thongs must have hardwood or fibre crossbars. Leather straps and rawhide thongs must not have metal or other conductive crossbars on them.

(11) Climbing gaffs must be kept properly sharpened and must be at least 1-1/8 inches in length.

(12) Lifelines must be protected against being cut or abraded.

(13) Fall arrest equipment, work positioning equipment, or travel restricting equipment must be used by employees working at elevated locations more than 4 feet (1.2 m) above the ground on poles, towers, or similar structures if other fall protection has not been provided.

AMENDATORY SECTION (Amending WSR 16-10-082, filed 5/3/16, effective 7/1/16)

WAC 296-45-908 Appendix F—Other Applicable safety and health Washington administrative codes.

Chapter 296-24 WAC, General safety and health standards;

Chapter 296-27 WAC, Recordkeeping and reporting;

Chapter 296-32 WAC, Safety standards for telecommunications;

Chapter 296-36 WAC, Safety standards—Compressed air work;

Chapter 296-37 WAC, Standards for commercial diving operations;

Chapter 296-52 WAC, Safety standards for possession, handling, and use of explosives;

Chapter 296-54 WAC, Safety standards—Logging operations;

Chapter 296-56 WAC, Safety standards—Longshore, stevedore and waterfront related operations;

Chapter 296-59 WAC, Safety standards for ski area facilities and operations;

Chapter 296-62 WAC, General occupational health standards;

Chapter 296-63 WAC, Right to know fee assessment;

Chapter 296-65 WAC, Asbestos removal and encapsulation;

Chapter 296-67 WAC, Safety standards for process safety management of highly hazardous chemicals;

Chapter 296-78 WAC, Safety standards for sawmills and woodworking operations;

Chapter 296-79 WAC, Safety Standards for pulp, paper, and paper-board mills and converters;

Chapter 296-99 WAC, Safety standards for grain handling facilities;

Chapter 296-115 WAC, Safety requirements for charter boats;

Chapter 296-155 WAC, Safety standards for construction work;

Chapter 296-301 WAC, Safety standards for the textile industry;

Chapter 296-303 WAC, Safety standards for laundry machinery and operations;

Chapter 296-304 WAC, Safety standards for ship repairing, ship-building, and shipbreaking;

Chapter 296-305 WAC, Safety standards for firefighters;

Chapter 296-307 WAC, Safety standards for agriculture;

Chapter 296-360 WAC, Discrimination, pursuant to RCW 49.17.160;

Chapter 296-800 WAC, Safety and health core rules;

Chapter 296-802 WAC, Employee medical and exposure records;

Chapter 296-803 WAC, Lockout/tagout (control of hazardous energy);

Chapter 296-806 WAC, Machine safety;

Chapter 296-807 WAC, Portable power tools;

Chapter 296-809 WAC, Confined spaces;

Chapter 296-811 WAC, Fire brigades;

Chapter 296-816 WAC, Protecting trade secrets;

Chapter 296-817 WAC, Hearing loss prevention (noise);

Chapter 296-818 WAC, Abrasive blasting;

Chapter 296-823 WAC, Occupational exposure to bloodborne pathogens;

Chapter 296-824 WAC, Emergency response;

Chapter 296-826 WAC, Anhydrous ammonia;

Chapter 296-828 WAC, Hazardous chemicals in laboratories;

Chapter 296-829 WAC, Helicopters used as lifting machines;

Chapter 296-832 WAC, Late night retail worker crime prevention;

Chapter 296-833 WAC, Temporary housing for workers;

Chapter 296-835 WAC, Dipping and coating operations (dip tanks);

Chapter 296-839 WAC, Content and distribution of material safety data sheets (MSDSs) and label information;

Chapter 296-841 WAC, Airborne contaminants;

Chapter 296-842 WAC, Respirators;

Chapter 296-843 WAC, Hazardous waste operations;

Chapter 296-848 WAC, Arsenic;
Chapter 296-849 WAC, Benzene;
Chapter 296-855 WAC, Ethylene oxide;
Chapter 296-856 WAC, Formaldehyde;
Chapter 296-860 WAC, Railroad clearances and walkways in private rail yards and plants;
Chapter 296-863 WAC, Forklifts and other powered industrial trucks;
Chapter 296-864 WAC, Split (multi-piece) rim and single-piece rim wheels;
Chapter 296-865 WAC, Motor vehicles;
Chapter 296-869 WAC, Elevating work platforms;
Chapter 296-870 WAC, Powered platforms;
Chapter 296-874 WAC, Scaffolds;
Chapter 296-876 WAC, Ladders, portable and fixed;
Chapter 296-878 WAC, Safety standards for window cleaning;
Chapter 296-880 WAC, Unified safety standards for fall protection.
Chapter 296-900 WAC, Administrative rules;
Chapter 296-901 WAC, Globally harmonized system for hazard communication.

AMENDATORY SECTION (Amending WSR 15-24-102, filed 12/1/15, effective 1/5/16)

WAC 296-56-60119 Protection from falling. (~~(You must make sure employees doing maintenance work on cranes, spouts or similar types of equipment, eight feet or more above the ground or surface and not in an area that is protected by any standard safeguards such as walkways with standard railings, or ladders with protective cages, wear a safety belt and lanyard which can be attached to the structure.)~~) The employer must ensure all employees are protected in accordance with the requirements in chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 15-24-102, filed 12/1/15, effective 1/5/16)

WAC 296-56-60123 Guarding of edges. (1) You must meet the following requirements for vehicle protection:

(a) Vehicle curbs, bull rails, or other effective barriers at least six inches (15.24 cm) in height and six inches in width, must be provided at the waterside edges of aprons and bulkheads, except where vehicles are prohibited. Curbs or bull rails installed after January 1, 1985, must be at least ten inches (22.9 cm) in height.

(b) The provisions of (a) of this subsection also apply at the edge of any fixed level above the common floor area from which vehicles may fall, except at loading docks, platforms and skids where cargo is moved by vehicles.

(2) (~~(You must meet the following requirements for employee protection:~~

~~(a) Guardrails must be provided at locations where employees are exposed to falls of more than four feet from floor or wall openings or waterside edges, including bridges or gangway-like structures leading to pilings, vessel mooring or berthing installations.~~

~~(b) Guardrails are not required:~~

~~(i) At loading platforms and docks;~~

~~(ii) At waterside edges used for cargo or mooring line handling;~~

~~(iii) On the working sides of work platforms, skids, or similar workplaces which abut the work area; or~~

~~(iv) On railroad rolling stock, highway vehicles, intermodal containers, or similar equipment.~~

~~(c) Where guardrails are impractical due to machinery requirements or work processes, an alternate means of fall protection, such as nets, must be used.~~

~~(3) You must make sure guardrails meet the following criteria:~~

~~(a) Guardrails must be capable of withstanding a force of at least two hundred pounds (890 N) applied in any direction at mid-span of the top rail (when used), or at the uppermost point if there is no guard rail.~~

~~(b) If not of solid baluster, grillwork, slatted, or similar construction, guardrails must consist of top rails and midrails. Midrails, when used, must be positioned at approximately half the height of the top rail.~~

~~(c) The top surface of guardrails installed before October 3, 1983, must be at least thirty-six inches (.91 m) high. Those installed after October 3, 1983, must be forty-two inches (1.07 m) high, plus or minus two inches (5.1 cm), high.~~

~~(d) Any nonrigid railing such as chain or wire rope must have a maximum sag, at the mid-point between posts, of not more than six inches (15.24 cm).~~

~~(e) Top rails must be free of sharp edges and maintained in good repair.~~

~~(f) Rail ends must not overhang. This does not prohibit scrollwork, boxed ends or similar nonhazardous projections.~~

~~(4) You must provide toeboards when employees below could be exposed to falling objects such as tools. Toeboards must be at least three and one-half inches (8.9 cm) in height from top edge to floor level, and be capable of withstanding a force of fifty pounds (222 N) applied in any direction. Drainage clearance not in excess of one-eighth inch under toeboards is permitted.~~

~~(5) Stair railings must be capable of withstanding a force of at least two hundred pounds (890 N) applied in any direction, and must not be more than thirty-six inches (0.91 m) nor less than thirty-two inches (0.81 m) in height from the upper top rail surface to the tread surface in line with the leading edge of the tread. Railings and mid-rails must be provided at any stairway having four or more risers, as follows:~~

~~(a) For stairways less than forty-four inches (1.12 m) wide, at least one railing; and~~

~~(b) For stairways more than forty-four inches (1.12 m) but less than eighty-eight inches (2.24 m) wide, a stair rail or handrail on each side, and if eighty-eight or more inches wide, an additional intermediate handrail.~~

~~(6) You must maintain railings in good repair and free of sharp edges.) The employer must ensure all employees are protected in accordance with the requirements in chapter 296-880 WAC, Unified safety standards for fall protection.~~

WAC 296-59-050 Personal protective equipment, general requirements. (1) Application.

(a) Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, must be provided at no cost to the employee, used, and maintained in a sanitary and reliable condition wherever it is indicated by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

(b) Employee-owned equipment. Where employees provide their own protective equipment, you must be responsible to ensure its adequacy, including proper maintenance, and sanitation of such equipment.

(c) Design, construction, testing, and use of personal protective equipment must comply with the requirements of the safety and health core rules, WAC 296-800-160; the Occupational health standards—Safety standards for carcinogens, chapter 296-62 WAC; or the currently applicable ANSI standard.

(2) Eye and face protection. Eye and face protective equipment must be provided and worn where there is exposure in the work process or environment to hazard of injury, which can be prevented by such equipment.

(3) Occupational head protection. Employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, must be protected by protective helmets, i.e., a lift operator would not be required to use a hardhat while operating the lift. However, if that same person is assisting with maintenance operations and is working under a tower where overhead work is being done, that operator would now be required to wear an approved helmet.

(a) Helmets for the protection of employees against impact and/or penetration of falling and flying objects must meet the specifications contained in American National Standards Institute, Z89.1-1986, Safety Requirements for Industrial Head Protection.

(b) Helmets for the head protection of employees exposed to high voltage electrical shock and burns must meet the specifications contained in American National Standards Institute, Z89.2-1971, Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B.

(c) Approved head protection must be worn by operators of snowmobiles and other mobile oversnow equipment which is not equipped with a rigid metal operator's cab.

(4) Occupational foot protection.

(a) Substantial footwear appropriate for the work conditions encountered must be worn by all employees.

(b) Where the job assignment includes exposure to slipping hazards, soles and heels of footwear must be of such material and design as to reduce the hazard of slipping.

(5) Requirements for safety belts, lifelines, lanyards, and nets (-

~~(a) Safety belts, lifelines, and lanyards which meet the requirements of ANSI A10.14 must be provided and used whenever employees are working in locations which expose them to a fall of more than ten feet. The particular work location and application must dictate which type of belt or harness and length of lanyard is used.~~

~~(b) Lifelines must be secured to an anchorage or structural member capable of supporting a minimum dead weight of five thousand four hundred pounds.~~

~~(c) Lifelines used on rock scaling applications or in areas where the lifeline may be subjected to cutting or abrasion must be a minimum of seven-eighths inch wire core manila rope or equivalent. For all other lifeline applications, three-fourths inch manila rope or equivalent with a minimum break strength of five thousand four hundred pounds may be used.~~

~~(d) Each safety belt lanyard must be a minimum of one-half inch nylon, or equivalent, with a minimum of five thousand four hundred pounds breaking strength.~~

~~(e) Employees will not be required to wear a safety belt and lanyard while riding on a standard lift chair while seated in the normal riding position.~~

~~(f) Safety nets meeting the requirements of ANSI A10.11 must be used when other acceptable forms of fall protection are not useable. When used, safety nets must extend a minimum of eight feet beyond the edge offering exposure, must be hung with sufficient clearance to prevent user's contact with surfaces or objects below, and must not be more than twenty-five feet below the fall exposure edge)) must be in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.~~

AMENDATORY SECTION (Amending WSR 17-16-132, filed 8/1/17, effective 9/1/17)

WAC 296-59-115 Ski lift facilities and structures. (1) Existing ski lift facilities and structures must not be required to be retrofitted with standard construction work platforms, walkways, stairs or guardrails on exterior surfaces when such features would add significantly to snow loading considerations. When such standard protective features are omitted, alternative personal protective measures must be used where possible. Examples include, but are not limited to: Safety belt and lanyard, ladder climbing safety devices, temporary work platforms or scaffolds, temporary or removable handrails, guardrails, or walkways.

(2) Snow removal.

(a) During the operating season, standard guardrails which would interfere with snow removal may be omitted in areas where it can be anticipated that frequent snow removal will be necessary to maintain operability of ski lift apparatus. Examples could include, but are not limited to, the motor house roof or loading and unloading areas.

(b) Personnel barricades, signs, or other devices must be used to deflect traffic or warn personnel of existing fall hazards.

(3) All ski lift towers installed after the effective date of this standard must be equipped with permanent ladders or steps which meet the following minimum requirements:

- (a) The minimum design live load must be a single concentrated load of two hundred pounds.
- (b) The number and position of additional concentrated live load units of two hundred pounds each as determined from anticipated usage of the ladder must be considered in the design.
- (c) The live loads imposed by persons occupying the ladder must be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.
- (d) The weight of the ladder and attached appurtenances together with the live load must be considered in the design of rails and fastenings.
- (e) All rungs must have a minimum diameter of three-fourths inch.
- (f) The distance between rungs on steps must not exceed twelve inches and shall be uniform throughout the ladder length. The top rung must be located at the level of the landing or equipment served by the ladder.
- (g) The minimum clear length of rungs or steps must be sixteen inches on new installations.
- (h) Rungs, cleats, and steps must be free of sharp edges, burrs, or projections which may be a hazard.
- (i) The rungs of an individual-rung ladder must be so designed that the foot cannot slide off the end. (A suggested design is shown in Figure D-1, at the end of this section.)
- (j) Side rails which might be used as a climbing aid must be of such cross sections as to afford adequate gripping surface without sharp edges or burrs.
- (k) Fastenings must be an integral part of fixed ladder design.
- (l) All splices made by whatever means must meet design requirements as noted in (a) of this subsection. All splices and connections must have smooth transition with original members and with no sharp or extensive projections.
- (m) Adequate means must be employed to protect dissimilar metals from electrolytic action when such metals are joined.
- (n) All welding must be in accordance with the "Code for Welding in Building Construction" (AWS D1.0-1966).
- (o) Protection from deterioration. Metal ladders and appurtenances must be painted or otherwise treated to resist corrosion and rusting when location demands.
- (4) Installation and clearance.
- (a) Pitch.
- (i) The preferred pitch of fixed ladders is between the range of seventy-five degrees and ninety degrees with the horizontal (Figure D-4).
- (ii) Substandard pitch. Fixed ladders must be considered as substandard if they are installed within the substandard pitch range of forty-five and seventy-five degrees with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range is considered as a critical range to be avoided, if possible.
- (iii) Pitch greater than ninety degrees. Ladders having a pitch in excess of ninety degrees with the horizontal are prohibited.
- (b) Clearances.
- (i) The perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder must be thirty-six inches for a pitch of seventy-six degrees, and thirty inches for a pitch of ninety degrees (Figure D-2), with minimum

clearances for intermediate pitches varying between these two limits in proportion to the slope.

(ii) A clear width of at least fifteen inches must be provided each way from the centerline of the ladder in the climbing space.

(iii) The side rails of through or side-step ladder extensions must extend three and one-half feet above parapets and landings.

(A) For through ladder extensions, the rungs must be omitted from the extension and must have not less than eighteen nor more than twenty-four inches clearance between rails.

(B) For side-step or offset fixed ladder sections, at landings, the side rails and rungs must be carried to the next regular rung beyond or above the three and one-half feet minimum.

(iv) Grab bars must be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars must have the same spacing as the ladder side rails. Grab bar diameters must be the equivalent of the round-rung diameters.

(v) Clearance in back of ladder. The distance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder must be not less than seven inches, except that when unavoidable obstructions are encountered, minimum clearances as shown in Figure D-3 shall be provided.

(vi) Clearance in back of grab bar. The distance from the centerline of the grab bar to the nearest permanent object in back of the grab bars must be not less than four inches. Grab bars must not protrude on the climbing side beyond the rungs of the ladder which they serve.

(c) The step-across distance from the nearest edge of a ladder to the nearest edge of the equipment or structure must not be more than twelve inches, or less than two and one-half inches. However, the step-across distance may be as much as twenty inches provided:

(i) The climber is wearing a safety belt and lanyard; and

(ii) The lanyard is attached to the tower structure before the climber steps off the ladder.

(5) Ski lift towers are not required to be equipped with ladder cages, platforms or landings.

(6) Maintenance and use.

(a) All ladders must be maintained in a safe condition. All ladders must be inspected regularly, with the intervals between inspections being determined by use and exposure.

(b) When ascending or descending, the climber must face the ladder.

(c) Personnel must not ascend or descend ladders while carrying tools or materials which could interfere with the free use of both hands.

(7) Personnel must be provided with and must use ladder safety devices or safety belts and lanyards whenever feasible.

(8) Personnel must not place mobile equipment or personal equipment such as skis, ski poles, or large tools within the falling radius of the lift tower while climbing or working on the lift tower.

(9) Ski lift towers and terminals are not required to be equipped with sheave guards on the haulrope wheels.

(10) Ski lift towers are not required to be equipped with work platforms.

(11) Personnel must use personal protective equipment such as a safety belt((s)) and lanyard((s ~~when working at unprotected elevated locations. Exception to this requirement must only be permitted for emergency rescue or emergency inspection if a safety belt and lanyard~~)).

~~is not immediately available. Required personal protective equipment must be made available as quickly as possible))~~ in accordance with the requirements of chapter 296-880 WAC, Unified safety standards for fall protection.

(12) When fixed ladders on towers do not reach all the way down to the ground or snow level, a specifically designed and constructed portable ladder must be used for access to and from the fixed ladder. Portable ladders must be constructed and maintained to the following requirements:

(a) The portable ladder must be constructed in accordance with applicable provisions of subsection (3) of this section.

(b) The portable ladder must be constructed with a minimum of two attachment hooks near the top to be utilized for securing the portable ladder onto the fixed ladder.

(c) The attachment hooks must be installed to support the portable ladder near the fixed ladder side rails.

(d) Rungs or steps on the portable ladder must be spaced to be identical with rungs or steps on the fixed ladder when the portable ladder is attached for use. The design criteria must achieve a horizontal plane relationship on the top (walking surface) portion of both steps when overlapping is necessary.

(e) The portable ladder must be equipped with a hold-out device near the bottom to assure clearance behind the steps as required by subsection (4) (b) (v) of this section.

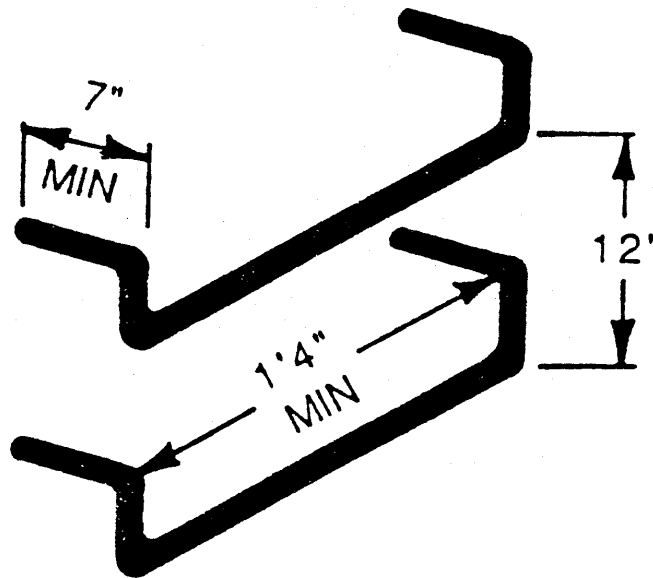


FIGURE D-1

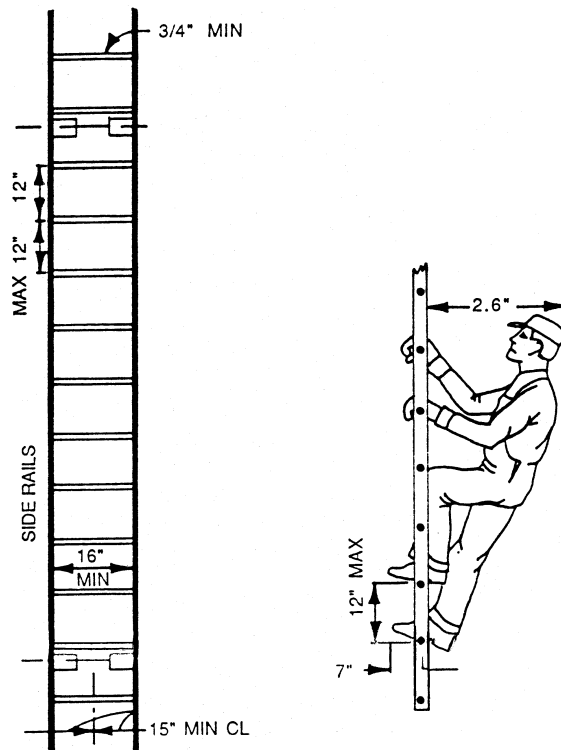


FIGURE D-2
Minimum Ladder Clearance

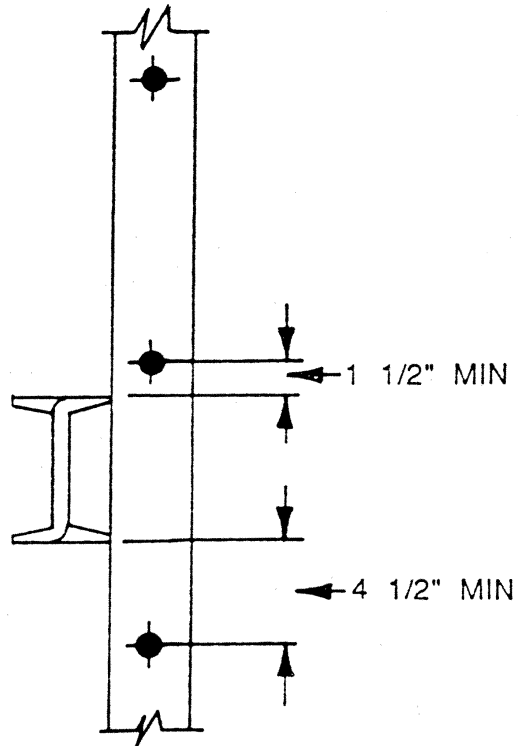


FIGURE D-3
Clearance for Unavoidable Obstruction
at Rear of Fixed Ladder.

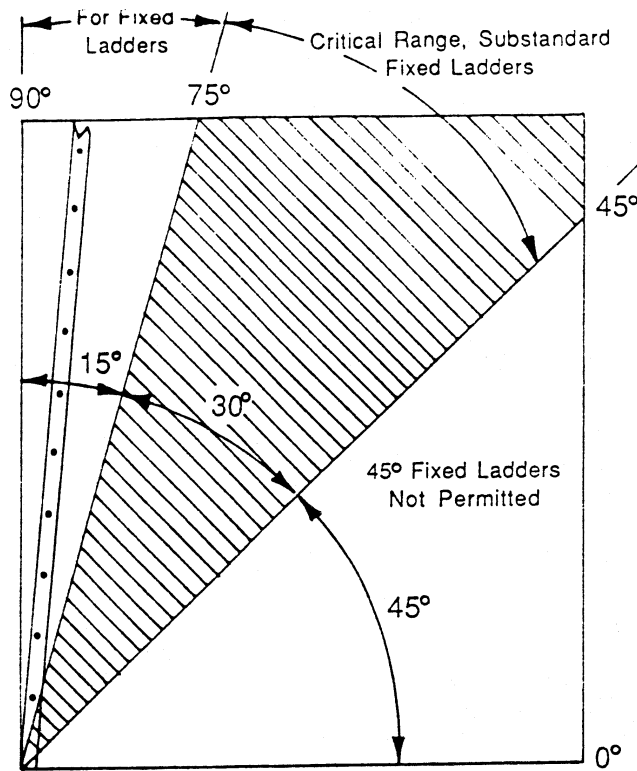


FIGURE D-4
Fixed Ladder Range

AMENDATORY SECTION (Amending WSR 18-04-096, filed 2/6/18, effective 3/9/18)

WAC 296-59-125 Ski lift aerial work platforms. (1) Construction and loading.

(a) All aerial work platforms must be constructed to sustain the permissible loading with a safety factor of four. The load permitted must be calculated to include:

- (i) The weight of the platform and all suspension components;
- (ii) The weight of each permitted occupant calculated at two hundred fifty pounds per person including limited handtools;
- (iii) The weight of any additional heavy tools, equipment, or supplies for tasks commonly accomplished from the work platform.

(b) The floor of the platform must not have openings larger than two inches in the greatest dimension.

(c) The platform must be equipped with toeboards at least four inches high on all sides.

(d) Guardrail(~~s~~

~~(i) The platform must be equipped with standard height and strength guardrails where such guardrails will pass through the configuration of all lifts on which it is intended to be used.~~

~~(ii) Where guardrails must be less than thirty six inches high in order to clear carriages, guideage, etc., guardrails must be as high as will clear the obstructions but never less than twelve inches high.~~

~~(iii) If the work platform is equipped with an upper work level, the upper level platform must be equipped with a toeboard at least four inches high.~~

~~(iv) Each platform must be equipped with a lanyard attachment ring for each permissible occupant to attach a safety belt lanyard.~~

~~(v) Each lanyard attachment ring must be of such strength as to sustain five thousand four hundred pounds of static loading for each occupant permitted to be attached to a specific ring.~~

~~(vi) Attachment rings must be permanently located as close to the center balance point of the platform as is practical.~~

~~(vii) The rings may be movable, for instance, up and down a central suspension rod, but must not be completely removable)) requirements must be in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.~~

(e) Platform attachment.

(i) The platform must be suspended by either a standard wire rope four part bridle or by solid metal rods, bars, or pipe.

(ii) The attachment means chosen must be of a type which will prevent accidental displacement.

(iii) The attachment means must be adjusted so that the platform rides level when empty.

(f) Maintenance.

(i) Every aerial work platform must be subjected to a complete annual inspection by qualified personnel.

(ii) The inspection must include all structural members, welding, bolted or treaded fittings, and the suspension components.

(iii) Any defect noted must be repaired before the platform is placed back in service.

(iv) A written record must be kept for each annual inspection. The record must include:

(A) The inspector identification;

(B) All defects found;

(C) The identity of repair personnel;

(D) Identity of the postrepair inspector who accepted the platform for use.

(g) The platform must be clearly identified as to the number of permissible passengers and the weight limit of additional cargo permitted.

(i) Signs must be applied on the outside of each side panel.

(ii) Signs must be maintained in clearly legible condition.

(h) Unless the side guardrail assembly is at least thirty-six inches high on all sides, signs must be placed on the inside floor or walls to clearly inform all passengers that they must use a safety belt and lanyard at all times when using the platform.

(2) Work platform use.

(a) Platforms must be attached to the haulrope with an attachment means which develops a four to one strength factor for the combined weight of the platform and all permissible loading.

(b) The haulrope attachment means must be designed to prevent accidental displacement.

(c) Trained and competent personnel must attach and inspect the platform before each use.

~~(d) ((Passengers must be provided with and must use the correct safety harness and lanyard for the intended work.~~

~~(e) Any time a passenger's position is not protected by a standard guardrail at least thirty-six inches high, the individual must be~~

~~protected by a short lanyard which will not permit free-fall over the platform edge.~~

~~(f) When personnel are passengers on a work platform and their work position requires the use of a safety harness and lanyard, the lanyard must be attached to the work platform, not to the haulrope or tower.~~

~~(g))~~ Work platform passengers must face in the direction of travel when the lift is moving.

~~((h))~~ (e) Tools, equipment and supplies must be loaded on the platform in such a fashion that the loaded platform can safely pass all towers and appurtenances.

~~((i))~~ (f) Heavy tools, equipment or supplies must be secured in place if they could fall over or roll within the platform and create a hazard for passengers.

~~((j))~~ (g) When the work crew is traveling on the work platform, the lift must be operated at a speed which is safe for that particular system and the conditions present.

Note: See Appendix 1 for operating procedure requirements.

AMENDATORY SECTION (Amending WSR 17-16-132, filed 8/1/17, effective 9/1/17)

WAC 296-78-71001 General. (1) Construction when not specifically covered in these standards, must be governed by such other standards adopted by the department of labor and industries as may apply.

(2) All buildings, docks, tramways, walkways, log dumps and other structures must be designed, constructed, and maintained to provide a safety factor of four. This means that all members must be capable of supporting four times the maximum load to be imposed. This provision refers to buildings, docks and so forth designed and constructed subsequent to the effective date of these standards and also refers in all cases where either complete or major changes or repairs are made to such buildings, docks, tramways, walkways, log dumps and other structures.

(3) Basements on ground floors under mills must be evenly surfaced, free from unnecessary obstructions and debris, and provided with lighting facilities in compliance with the requirements of the safety and health core rules, WAC 296-800-210.

(4) All engines, motors, transmission machinery or operating equipment installed in mill basements or ground floors must be equipped with standard safeguards for the protection of workers.

(5) Flooring of buildings, ramps and walkways not subject to supporting motive equipment must not be of less than two-inch wood planking or material of equivalent structural strength.

(6) Flooring of buildings, ramps, docks, trestles and other structures required to support motive equipment must not be of less than full two and one-half inch wood planing or material of equivalent structural strength. However, where flooring is covered by steel floor plates, two inch wood planking or material of equivalent structural strength may be used.

(7) Walkways, docks, and platforms.

(a) Walkways, docks and platforms must be constructed and maintained in accordance with the requirements of WAC 296-24-735 (~~through 296-24-75011 and~~), WAC 296-800-270, and in accordance with chapter 296-880 WAC.

(b) Maintenance. Walkways must be evenly floored and kept in good repair.

(c) Where elevated platforms are used, they must be equipped with stairways or ladders in accordance with WAC 296-24-765 through 296-24-81013, WAC 296-800-250 and chapter 296-876 WAC, Ladders, portable and fixed.

AMENDATORY SECTION (Amending WSR 17-16-132, filed 8/1/17, effective 9/1/17)

WAC 296-78-71003 Floor and wall openings. (1) All floor and wall openings, either temporary or permanent, must be protected (~~as required by WAC 296-24-750 through 296-24-75011 and WAC 296-800-260~~) in accordance with chapter 296-880 WAC.

(2) The area under floor openings must, where practical, be fenced off. When this is not practical, the areas must be plainly

marked with yellow lines and telltails must be installed to hang within five and one-half feet of the ground or floor level.

(3) Where floor openings are used to drop materials from one level to another, audible warning systems must be installed and used to indicate to employees on the lower level that material is to be dropped.

WAC 296-79-020 General requirements. (1) Housekeeping.

Floors must be kept reasonably clear of spilled or leaking oil, grease, water, broke, etc., that may cause slipping, tripping or falling. Nonskid type surfacing must be installed in vehicular or pedestrian traffic areas where slipping hazards otherwise would exist.

(a) In areas where it is not possible to keep the floor free of materials which cause a slipping hazard, mats, cleats, or other suitable materials which will effectively minimize or eliminate the hazard must be installed.

(b) Hoses, cords, slings or similar items or equipment must be stored in such a manner that they will not create a hazard.

(2) Storage and transportation of materials. Materials, objects or equipment must be stored or transported by methods which will prevent them from falling, tipping or rolling.

(3) Warning of open manholes or excavations must be in accordance with chapter 296-880 WAC, Unified safety standards for fall protection. Open manholes or excavations must be:

(a) Roped off, barricaded, or adequately safeguarded when located in or adjacent to walkways, aisleways, or roadways.

(b) Provided with warning lights or lanterns during periods of darkness or reduced visibility.

(4) Training. Employees must receive proper instruction and be familiar with safe operating procedures:

(a) Before they supervise the operation, or make adjustments to any machine or equipment.

(b) To be able to cope with emergencies arising from breaks, ruptures, or spills which would create a hazardous condition.

(c) For lifting and moving objects. Mechanical devices should be used or employees should ask for assistance in lifting or moving heavy objects.

(d) On prompt reporting of any faulty equipment or hazardous condition to the person in charge.

(5) Working alone. When an employee is assigned to work alone in a remote or isolated area, procedures must be developed to ensure:

(a) That the employee reports by use of radio or telephone to someone periodically; or

(b) That at reasonable intervals a designated person must check on the employee; and

(c) That all persons involved in working alone are advised of the procedures to be followed.

(6) Exits from hazardous areas. Where physically and reasonably possible, there must be at least two unobstructed exits from any hazardous area. Such exits should be on opposite walls.

(7) Safe work area. Sufficient clearance must be maintained between machines to allow employees a safe work area.

(8) Protection from overhead hazard. Warning signs/devices must be:

(a) Placed in conspicuous locations below areas where overhead work is being done; and

(b) Removed promptly when work is completed and the overhead hazard no longer exists.

(9) Welding areas protected.

(a) Areas in which welding is being done must be screened or barricaded to protect persons from flash burns, when practical.

(b) If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash must be properly protected.

(10) Testing safety devices. Brakes, back stops, anti-runaway devices, overload releases, emergency stops, and other safety devices must be inspected and tested frequently to ensure that all are operative and maintained in good repair.

(11) Starting and stopping devices.

(a) Electrically or manually operated power starting or stopping devices must be provided within easy reach of the operator from the normal operating position.

(b) If necessary for safety of the operation, the machine must be so equipped that retarding or braking action can be applied at the time of or after the source of power is deactivated.

(12) Interlocks:

(a) Interlocks that affect the safety of employees must not be bypassed except where you demonstrate alternate procedures or devices that provide a level of safety for employees equivalent to those provided by the safety interlock. Interlocks are considered to be bypassed anytime the designed control strategy is bypassed by means including, but not limited to, a temporary wiring change, physical interference or a temporary software change of "force."

(b) Prior to bypassing a safety interlock you must:

(i) Develop a written procedure detailing how the bypass will be accomplished and the alternate means of protecting employees;

(ii) Inform affected employees of all pertinent information including at a minimum the reason for the change, the date of the change, who is responsible for the change, and approximately how long the change will be in effect; and

(c) Post appropriate warning of the change on the equipment or area.

(13) Designing control systems. You must ensure that all control systems are designed to:

(a) Ensure that the system does not create an unsafe state that endangers personnel;

(b) Ensure that when control systems fail, the equipment being controlled fails to a safe state; and

(c) Have an independent method to safely stop the process or equipment, such as a hardwired emergency stop button or other controls that deenergize the system, or independent methods to force the system to a safe state.

(14) Compressed air.

(a) Compressed air must not be used for cleaning clothing that is being worn, or if it will endanger persons in the area.

(b) Sections of high pressure air hoses must be properly coupled and have safety chains or equivalent safety device attached between the sections (30 psi or more is high pressure air).

(15) Punch bars. Open pipes must not be used as punch bars if the use would create a hazard.

(16) Saw table limit stop or extension. Employees must be protected from contact with the front edge of a circular saw by:

(a) A limit stop which will prevent the forward swing of the cutting edge from extending beyond the edge of the table; or

(b) Installation of a table extension.

(17) Powder-actuated tools.

(a) Powder-actuated tool design, construction, operation and use must comply with all requirements specified in "safety requirements for powder actuated fastening systems," (see chapter 296-24 WAC, Part H-1).

(b) A careful check must be made to ensure that no cartridges or charges are left where they could enter equipment or be accidentally discharged in any area where they could create a fire or explosion hazard.

(18) Ladders required on waterfront docks. You must ensure that either permanent ladders or portable ladders:

(a) Are readily available for emergency use on all waterfront docks;

(b) Extend from the face of the dock to the water line at its lowest elevation;

(c) Are installed at intervals not to exceed 400 feet;

(d) Are noticeable by painting the dock area immediately adjacent to the ladder with a bright color which contrasts with the surrounding area; and

(e) Have been secured with a suitable method.

Note: When working on or around water also see WAC 296-800-160.

(19) Prevent overhang while removing materials. Extreme care must be taken to prevent material from creating an overhang while removing the materials from piles or bins.

AMENDATORY SECTION (Amending WSR 17-16-132, filed 8/1/17, effective 9/1/17)

WAC 296-79-110 Elevated runways and ramps used by vehicles. (1)

Runways and ramps must:

(a) Be cleated, grooved, rough surfaced, or covered with a material that will minimize the danger of skidding; and

(b) Not have a maximum incline exceeding 20° from horizontal if used for wheeled equipment.

(2) Guarding exposed sides.

(a) Elevated ramps or runways used for the travel of wheeled equipment must have exposed sides guarded with a substantial bull rail or shear rail of sufficient height to prevent wheeled equipment from going over the rail.

(b) If elevated ramps or runways are used by pedestrians, standard guardrails must be installed on runways wherever the height exceeds 4 feet above the adjacent area (~~except where used for loading or unloading purposes~~) in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.

PART C-1
FALL PROTECTION REQUIREMENTS FOR CONSTRUCTION

NOTE: Requirements relating to fall protection for construction have been moved to chapter 296-880 WAC, Unified safety standards for fall protection.

REPEALER

The following sections of the Washington Administrative Code are repealed:

- | | |
|-------------------|---|
| WAC 296-155-24601 | Scope and application. |
| WAC 296-155-24603 | Definitions. |
| WAC 296-155-24605 | General requirements. |
| WAC 296-155-24607 | Fall protection required regardless of height. |
| WAC 296-155-24609 | Fall protection required at four feet or more. |
| WAC 296-155-24611 | Fall protection required at ten feet or more. |
| WAC 296-155-24613 | Fall arrest specifications. |
| WAC 296-155-24615 | Fall restraint specifications. |
| WAC 296-155-24617 | Positioning device system specifications. |
| WAC 296-155-24619 | Other specifications. |
| WAC 296-155-24621 | Training. |
| WAC 296-155-24623 | Appendix A—Determining roof widths—Nonmandatory guidelines for complying with WAC 296-155-24615. |
| WAC 296-155-24624 | Appendix B—Calculating fall clearance distance using a shock-absorbing lanyard and D-ring anchorage connector—Nonmandatory guidelines for complying with WAC 296-155-24613 (1) (d). |

WAC 296-155-325 General requirements for storage. (1) General.

(a) You must stack, rack, block, interlock, or otherwise secure materials stored in tiers to prevent sliding, falling or collapse.

(b) You must conspicuously post 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. You must not exceed maximum safe loads.

(c) You must keep aisles and passageways clear to provide for the free and safe movement of material handling equipment or employees. You must keep such areas in good repair.

(d) When a difference in road or working levels exist, you must use means such as ramps, blocking, or grading to ensure the safe movement of vehicles between the two levels.

(e) When necessary to store building material on public thoroughfares, you must exercise care to see that it is so piled or stacked as to be safe against collapse or falling over.

(f) You must locate material so as not to interfere with, or present a hazard to employees, traffic, or the public.

(2) Material storage.

(a)(i) You must not place material stored inside buildings under construction within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, must be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it must be anchored and braced to prevent displacement in any direction. In addition this equipment must be subject to the provisions of this subsection while in "interim storage."

(b) Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas must be equipped with personal fall arrest equipment meeting the requirements of chapter ~~((296-155 WAC, Part C-1))~~ 296-880 WAC, Unified safety standards for fall protection.

(c) You must segregate noncompatible materials in storage.

(d) You must stack bagged materials by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags you must carefully handle them to prevent the bags bursting.

(ii) You must not pile cement and lime bags more than 10 bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, you must keep the length of the pile at an even height, and the necessary step backs every 5 bags maintained.

(iv) Persons handling cement and lime bags must wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and must wear long sleeve shirts with close fitting collar and cuffs.

(v) You must warn workers against wearing clothing that has become hard and stiff with cement.

(vi) You must instruct workers to report any susceptibility of their skin to cement and lime burns.

(vii) You must provide a hand cream or vaseline and eye wash and keep it ready for use to prevent burns.

(viii) You must store lime in a dry place to prevent a premature slacking action that may cause fire.

(e) You must not store materials on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks must not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it must be tapered back two inches in every foot of height above the 4-foot level.

(i) You must never stack brick, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, you must dump them toward the inside of the building and not toward the wall.

(iii) You must always stack blocks and not throw them in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack must be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, you must distribute the piles so as not to overload the floor on which they stand.

(ii) Blocks must not be dropped or thrown from an elevation or delivered through chutes.

(h) **Lumber:**

(i) Used lumber must have all nails withdrawn before stacking.

(ii) You must stack lumber on level and solidly supported sills.

(iii) You must stack lumber so as to be stable and self-supporting.

(iv) Lumber stacks must not exceed 20 feet in height provided that lumber to be handled manually must not be stacked more than 16 feet high.

(v) You must stack all stored lumber on timber sills to keep it off the ground. You must place sills level on solid supports.

(vi) You must place cross strips in the stacks when they are stacked more than 4 feet high.

(i) You must stack and block structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel must wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, you must provide a strong bench, set up on even dry ground or a floor for the persons to work on.

(iii) You must carefully pile structural steel to prevent danger of members rolling off or the pile toppling over.

(iv) You must keep structural steel in low piles, consideration being given to the sequence of use of the members.

(v) You must stack corrugated and flat iron in flat piles, with the piles not more than 4 feet high and spacing strips must be placed between each bundle.

(j) **Sand, gravel and crushed stone.**

(i) You must frequently inspect piles to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

(ii) If material becomes frozen, you must not remove it in a manner that would produce an overhang.

WAC 296-155-477 Stairways. (1) **General.** The following requirements apply to all stairways as indicated:

(a) Stairways that will not be a permanent part of the structure on which construction work is being performed must have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise.

(b) You must install stairs between 30 degrees and 50 degrees from horizontal.

(c) In all buildings or structures two or more stories or 24 feet or more in height or depth, you must install suitable permanent or temporary stairways.

(d) You must provide stairways, ramps or ladders at all points where a break in elevation of 18 inches or more occurs in a frequently traveled passageway, entry or exit.

(e) You must provide a minimum of one stairway for access and exit for buildings and structures to 3 stories or 36 feet; if more than 3 stories or 36 feet, you must provide two or more stairways. Where two stairways are provided and work is being performed in the stairways, you must maintain one clear for access between levels at all times.

(f) **Wood frame buildings.**

(i) You must complete the stairway to a second or higher floor before studs are raised to support the next higher floor.

(ii) You must provide roof and attic work areas of all buildings with a safe means of access and egress, such as stairways, ramps or ladders.

(iii) You must nail cleats to studs to provide access to and egress from roof or other work areas.

(g) **Steel frame buildings.** Stairways must extend to the uppermost floor that has been planked or decked. Ladders may be used above that point.

(h) **Reinforced concrete or composite steel - Concrete buildings.** Stairways must extend to the lowermost floor upon which a complete vertical shoring system is in place. A minimum of two ladders at different locations for each floor may be used above this floor but not to exceed 3 floors.

(i) Riser height and tread depth must be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variations in riser height or tread depth must not be over 1/4-inch (0.6 cm) in any stairway system.

(j) Where doors or gates open directly on a stairway, you must provide a platform, and the swing of the door must not reduce the effective width of the platform to less than 20 inches (51 cm).

(k) You must secure metal pan landings and metal pan treads, when used, in place before filling with concrete or other material.

(l) All parts of stairways must be free of hazardous projections, such as protruding nails.

(m) You must eliminate slippery conditions on stairways before the stairways are used to reach other levels.

(n) You are permitted to use alternating tread type stairs as long as they install, use, and maintain the stairs in accordance with manufacturer's recommendations and the following:

(i) The stair must be installed at an angle of 70 degrees or less.

(ii) The stair must be capable of withstanding a minimum uniform load of 100 pounds per square foot with a design factor of 1.7, and the treads must be capable of carrying a minimum concentrated load of 300 pounds at the center of any treadspan or exterior arc with a design factor of 1.7. If the stair is intended for greater loading, construction must allow for that loading.

(iii) The stair must be equipped with a handrail on each side to assist the user in climbing or descending.

(o) Due to space limitations, when a permanent stairway must be installed at an angle above 50 degrees, such an installation (commonly called an inclined or ship's ladder) must have treads, open risers and handrails on both sides.

(p) Where ladders are permitted for access under subsection (1) of this section, you must provide means for employee hoisting of tools and material, such as a well wheel and hoisting line or the equivalent, so employees will have both hands free for ascending and descending ladders.

(2) **Temporary service.** The following requirements apply to all stairways as indicated:

(a) Except during stairway construction, foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled in with concrete or other material at a later date, unless the stairs are temporarily fitted with wood or other solid material at least to the top edge of each pan. You must replace such temporary treads and landings when worn below the level of the top edge of the pan.

(b) Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.

(c) Treads for temporary service must be made of wood or other solid material, and must be installed the full width and depth of the stair.

(3) **Stair rails and handrails.** The following requirements apply to all stairways as indicated:

(a) Stairways having 4 or more risers or rising more than 30 inches (76 cm), whichever is less, must be equipped with:

(i) At least one handrail; and

(ii) One stair rail system along each unprotected side or edge.

Note: When the top edge of a stair rail system also serves as a handrail, subdivision (g) of this subsection applies.

(b) Winding and spiral stairways must be equipped with a handrail offset sufficiently to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15 cm).

(c) The height of stair rails must be as follows:

(i) Stair rails installed after the effective date of this standard, must be not less than 36 inches (91.5 cm) from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(ii) Stair rails installed before the effective date of this standard, must be not less than 30 inches (76 cm) nor more than 34 inches (86 cm) from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(d) You must provide midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, between the top rail of the stair rail system and the stairway steps.

(i) You must locate midrails, when used, at a height midway between the top edge of the stair rail system and the stairway steps.

(ii) Screens or mesh, when used, must extend from the top rail to the stairway step, and along the entire opening between top rail supports.

(iii) When intermediate vertical members, such as balusters, are used between posts, they must be not more than 19 inches (48 cm) apart.

(iv) You must install other structural members, when used, such that there are no openings in the stair rail system that are more than 19 inches (48 cm) wide.

(e) Handrails and the top rails of stair rail systems must be capable of withstanding, without failure, a force of at least 200 pounds (890 n) applied within two inches (5 cm) of the top edge, in any downward or outward direction, at any point along the top edge.

(f) The height of handrails must be not more than 37 inches (94 cm) nor less than 30 inches (76 cm) from the upper surface of the handrail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(g) When the top edge of a stair rail system also serves as a handrail, the height of the top edge must be not more than 37 inches (94 cm) nor less than 36 inches (91.5 cm) from the upper surface of the stair rail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.

(h) Stair rail systems and handrails must be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

(i) Handrails must provide an adequate handhold for employees grasping them to avoid falling.

(j) The ends of stair rail systems and handrails must be constructed so as not to constitute a projection hazard.

(k) Handrails that will not be a permanent part of the structure being built must have a minimum clearance of 3 inches (8 cm) between the handrail and walls, stair rail systems, and other objects.

(l) You must provide unprotected sides and edges of stairway landings with guardrail systems. Guardrail system criteria are contained in chapter (~~(296-155 WAC, Part C-1, Fall protection requirements for construction)~~) 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-52902 Definitions. Accredited crane certifier. A crane inspector who has been accredited by the department.

A/D director (assembly/disassembly) director. An individual who meets the requirements in this part for an A/D director, irrespective of the person's formal job title or whether the person is nonmanagement or management personnel.

Angle of loading. The acute angle between horizontal and the leg of the rigging, often referred to as horizontal angle. See Figures 18 and 33.

Anti two-block device. A device that, when activated, disengages all crane functions whose movement can cause two-blocking.

Apprentice operator or trainee. A crane operator who has not met requirements established by the department under RCW 49.17.430.

Articulating boom crane. A crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.

Assembly/disassembly. The assembly and/or disassembly of components or attachments covered under this part. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly." Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing height of the crane is an erection process.

Assist crane. A crane used to assist in assembling or disassembling a crane.

Attachments. Any device that expands the range of tasks that can be done by the crane/derrick. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.

Audible signal. A signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.

Basket hitch. A method of rigging a sling in which the sling is passed around the load and both loop eyes or end fittings are attached to the lifting device.

Below-the-hook lifting device. A device used for attaching loads to a hoist. The device may contain components such as slings, hooks, rigging hardware, and lifting attachments.

Bird caging. The twisting of fiber or wire rope in an isolated area of the rope in the opposite direction of the rope lay, thereby causing it to take on the appearance of a bird cage.

Blocking (also referred to as "cribbing"). Wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support latticed boom sections during assembly/disassembly and under outrigger and stabilizer floats.

Boatswain's chair. A single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.

Bogie. See "travel bogie."

Boom (other than tower crane). An inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.

Boom (tower cranes). On tower cranes: If the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.

Boom angle indicator. A device which measures the angle of the boom relative to horizontal.

Boom hoist limiting device. Includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic

relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.

Boom length indicator. Indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.

Boom stop. Includes boom stops (belly straps with struts/stand-off), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.

Boom suspension systems. A system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.

Braided wire rope. A wire rope formed by plaiting component wire ropes.

Bridle wire rope sling. A sling composed of multiple legs with the top ends gathered in a fitting that goes over the lifting hook.

Builder. The builder/constructor of derricks.

Cable laid endless sling-mechanical joint. A wire rope sling made endless from one continuous length of cable laid rope with the ends joined by one or more metallic fittings.

Cable laid grommet-hand tucked. An endless wire rope sling made from one continuous length of rope formed to make a body composed of 6 ropes around a rope core. The rope ends are tucked into the body, thus forming the core. No sleeves are used.

Center of gravity. The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.

Certified crane inspector. A crane certifier accredited by the department.

Certified welder. A welder who meets nationally recognized certification requirements applicable to the task being performed.

Choker hitch. A method of rigging a sling in which the sling is passed around the load, then through one loop eye, end fitting, or other device, with the other loop eye or end fitting attached to the lifting device. This hitch can be done with a sliding choker hook or similar device.

Climbing. The process in which a tower crane is raised or lowered to a new working height, either by adding or removing tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised or lowered inside the structure (inside climbing).

Come-a-long. A mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.

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

Construction work. (For the purposes of this part) all or any part of excavation, construction, erection, alteration, repair, demolition, and dismantling of buildings and other structures and all related operations; the excavation, construction, alteration, and repair of sewers, trenches, caissons, conduits, pipelines, roads, and all re-

lated operations; the moving of buildings and other structures, and the construction, alteration, repair, or removal of wharfs, docks, bridges, culverts, trestles, piers, abutments, or any other related construction, alteration, repair, or removal work. Construction work does not include the normal day-to-day activities at manufacturing facilities or powerhouses.

Controlled load lowering. Lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.

Controlling entity. An employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the projects, its planning, quality, and completion.

Counterjib (counterweight jib). A horizontal member of the tower crane on which the counterweights and usually the hoisting machinery are mounted.

Counterweight. Weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.

Crane. Power-operated equipment used in construction that can hoist, lower, and horizontally move a suspended load. "Crane" includes, but is not limited to: Articulating boom cranes, such as knuckle-boom cranes; crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes, such as wheel-mounted, rough-terrain, all-terrain, commercial truck mounted, and boom truck cranes; multipurpose machines when configured to hoist and lower by means of a winch or hook and horizontally move a suspended load; industrial cranes, such as carry-deck cranes; dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes, such as fixed jib, hammerhead boom, luffing boom, and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; side-boom tractors; derricks; and variations of such equipment.

Crane/derrick type. Cranes or derricks as established by American Society of Mechanical Engineers (ASME). Crane operator means an individual engaged in the operation of a crane.

Crane level indicator. A device for determining true horizontal (also see safety devices).

Crawler crane. Equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.

Critical lift. A lift that:

- Exceeds 75 percent of the crane or derrick rated load chart capacity; or
- Requires the use of more than one crane or derrick.

Cross rod. A wire used to join spirals of metal mesh to form a complete fabric. See Figure 22.

Crossover points. Locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum, reaches the flange, and begins to wrap back in the opposite direction.

Dedicated channel. A line of communication assigned by the employer who controls the communication system to only one signal person

and crane/derrick or to a coordinated group of cranes/derricks/signal persons.

Dedicated drilling rig. A machine which creates bore holes and/or shafts in the ground.

Dedicated pile-driver. A machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.

Dedicated spotter (power lines). To be considered a dedicated spotter, the requirements of WAC 296-155-53302 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, the load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.

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

Design factor. The ratio between nominal or minimum breaking strength and rated load.

Digger derrick. A multipurpose vehicle-mounted machine which is primarily designed to accommodate components that dig holes, set poles, and position materials and apparatus.

Directly under the load. A part or all of an employee is directly beneath the load.

Dismantling. Includes dismantling (such as dismantling to shorten a boom or substitute a different component).

Drum rotation indicator. A device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.

Electrical contact. When a person, object, or equipment makes contact or comes close in proximity with an energized conductor or equipment that allows the passage of current.

Employer-made equipment. Floating cranes/derricks designed and built by an employer for your own use.

Encroachment. Where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this part requires to be maintained from a power line.

Equipment criteria. Instructions, recommendations, limitations and specifications.

Fabric (metal mesh). The flexible portion of the sling exclusive of end fittings consisting of a series of transverse spirals and cross rods.

Fall protection equipment. Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

Fall restraint system. A ~~((fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors, and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices))~~ system in which all necessary components function together to restrain/prevent an employee from falling to a lower level. Types of fall restraint systems include standard guardrail systems, personal fall restraint systems, warning line systems, or a warning line system and safety monitor.

Fall zone. The area (including, but not limited to, the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

Flange points. A point of contact between rope and drum flange where the rope changes layers.

Floating cranes/derricks. Equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.

Free fall (of the load line). When only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).

Free rated load test. Testing stability and operation of crane, carrier, wheels, tires, tracks, brakes, etc., under load, when lifting without outriggers and/or traveling with the load are permitted at the activity for the type of crane being tested.

Free surface effect. The uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.

Functional testing. The testing of a crane, typically done with a light load or no load, to verify the proper operation of a crane's primary function, i.e., hoisting, braking, booming, swinging, etc. A functional test is contrasted to testing the crane's structural integrity with heavy loads.

Gin pole derrick. A boom without a mast which has guys arranged from its top to permit leaning the mast in one or more directions. The load is lifted and lowered by ropes reeved through sheaves or blocks at the top of the mast and the lower block.

Ground conditions. The ability of the ground to support the crane/derrick (including slope, compaction, and firmness).

Ground crew. Those individuals who are involved in the personnel lift, other than the hoisting equipment operator and the platform occupants. These individuals include riggers, signal persons, and supervision.

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

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

Hairpin anchors. A hairpin-shaped, guy-supporting anchor that is placed in footings or walls before concrete is poured and held in place by the cured concrete.

Hitch (hitched). A method of rigging (attaching) a sling temporarily to a load or object for the purpose of lifting.

Hoist. A mechanical device for lifting and lowering loads by winding rope onto or off a drum.

Hoisting. The act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, "hoisting" can be done by means other than wire rope/hoist drum equipment.

Hoisting equipment. A machine for lifting and lowering a load and moving it horizontally. The machine may be fixed or mobile and be driven manually, by power, or by a combination of both.

Hook latch. A mechanical device used to close the throat opening of a hook.

Insulating link/device. An insulating device listed, labeled, or accepted by a nationally recognized testing laboratory in accordance with 29 C.F.R. 1910.7.

Intermediate rail. The middle member of a barrier along the edges of a platform, located approximately one-half the distance between the platform floor and top rail.

Jib. An extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom. For tower cranes, see boom (tower cranes).

Jib stop (also referred to as a jib backstop). The same type of device as a boom stop but is for a fixed or luffing jib.

Land crane/derrick. Equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of flotation.

List. The angle of inclination about the longitudinal axis of a barge, pontoons, vessel, or other means of flotation.

Live boom. A boom whose lowering is controlled by a brake without the aid of other lowering retarding devices (free-fall capable).

Live load line. A load line whose lowering is controlled by a brake without the aid of other lowering retarding devices (free-fall capable).

Load. The weight of the object being lifted or lowered, including the weight of the load-attaching equipment such as the load block, ropes, slings, shackles, and any other auxiliary attachment.

Load moment (or rated capacity) indicator. A system which aids the equipment operator by sensing the overturning moment on the equipment, i.e., load X radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.

Load moment (or rated capacity) limiter. A system which aids the equipment operator by sensing the overturning moment on the equipment, i.e., load X radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.

Load ratings. A set of rated loads for stipulated hoisting equipment configurations and operating conditions.

Load sustaining/bearing parts. Those parts of a crane that support the crane or load and upon failure could cause dropping, uncontrolled shifting, or uncontrolled movement of the crane or load.

Locomotive crane. A crane mounted on a base or car equipped for travel on a railroad track.

Luffing boom. A member hinged to the rotating superstructure and used for supporting the hoisting tackle.

Luffing jib limiting device. Similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.

Marine worksite. A construction worksite located in, on or above the water.

Master coupling link. An alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links.

Master link. Forged or welded steel link used to support all members (legs) of an alloy steel chain sling or wire rope sling.

Mechanical coupling link (alloy steel chain). A nonwelded, mechanically closed link used primarily to attach fittings to alloy steel chain.

Mobile cranes. A lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.

Moving point-to-point. The times during which an employee is in the process of going to or from a work station.

Multipurpose machine. A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When configured with the forks/tongs, it is not covered by this part. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this part.

Multiple lift rigging. A rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to 5 independent loads to the hoist rigging of a crane.

Nationally recognized accrediting agency. An organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations.

Nonconductive. Because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).

Nonstandard tower crane base. Any deviation from the structural support or base configuration recommended by the crane manufacturer.

Occasional or routine maintenance and repair work. Regular, customary and foreseeable work necessary to keep equipment in good repair and/or condition. This also includes regular, customary and foreseeable work necessary to return equipment to sound condition after damage.

Operational aid. An accessory that provides information to facilitate operation of a crane or that takes control of particular functions without action of the operator when a limiting condition is sensed. Examples of such devices include, but are not limited to, the following: Anti-two-block device, rated capacity indicator, rated capacity (load) limiter, boom angle or radius indicator, lattice boom hoist disconnect device, boom length indicator, drum rotation indicator, load indicator, and wind speed indicator.

Operational controls. Levers, switches, pedals and other devices for controlling equipment operation.

Operator. A person who is operating the equipment.

Outriggers. Extendable or fixed members attached to the mounting base, which rests on supports at the outer ends, used to support the crane.

Overhead/bridge and gantry cranes. Includes overhead/bridge cranes, cranes on monorails, under hung cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.

Pendants. Includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning

segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.

Personal fall arrest system. A fall arrest system (~~((used to arrest an))~~) that is worn by the employee in a fall from (~~((a working level))~~) elevation. It consists of an (~~((anchorage))~~) anchor point, connectors, (~~((and))~~) a full body harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these.

Personnel lifting. Raising, lowering, or transporting personnel using a crane/derrick.

Personnel platform - Boom attached. A platform attached to the boom of the crane.

Personnel platform - Suspended. A platform attached to a crane/derrick using wire rope, chain, or a jointed attachment and that has no installed motion controls for the platform itself.

Personnel platform suspension system. The rope or chain slings and other components, including fastening devices, used to connect the crane/derrick to the personnel platform.

Platform occupant. A person who is within the guardrail barrier while the personnel platform is in a hoisted position.

Platform rating. The maximum capacity of a personnel lifting platform, established by the platform manufacturer, in terms of total weight and the number of occupants allowed.

Portal crane. A type of crane consisting of a rotating upper structure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.

Power controlled lowering. A system or device in the power train, other than the load hoist brake, that can regulate the lowering rate of speed of the load hoist mechanism.

Powerhouse. A plant wherein electric energy is produced by conversion from some other form of energy (e.g., chemical, nuclear, solar, mechanical, or hydraulic) by means of suitable apparatus. This includes all generating station auxiliaries and other associated equipment required for the operation of the plant. Not included are stations producing power exclusively for use with communication systems.

Power lines. Electrical distribution and electrical transmission lines.

Procedures. Include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols, and limitations.

Proximity alarm. A device that provides a warning of proximity to a power line that has been listed, labeled or accepted by a nationally recognized testing laboratory in accordance with 29 C.F.R. 1910.7.

Qualified crane operator. A crane operator who meets the requirements established by the department under RCW 49.17.430.

Qualified evaluator (not a third party). A person employed by the signal person's or the rigger's employer (as applicable) who has demonstrated that he/she is competent in accurately assessing whether individuals meet the qualification requirements in this part for a signal person or a rigger.

Qualified evaluator (third party). An entity that, due to its independence and expertise, has demonstrated that it is competent in ac-

curately assessing whether individuals meet the qualification requirements in this part for a signal person or a rigger.

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

Qualified rigger. A rigger who meets the requirements in WAC 296-155-53306.

Qualified signal person. A signal person who meets the requirements in WAC 296-155-53302.

Range control limit device. A device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.

Range control warning device. A device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.

Rated capacity. The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.

Rated capacity indicator. See load moment indicator.

Rated capacity limiter. See load moment limiter.

Repetitive pickup points. Refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

Rotation resistant rope. A type of wire rope construction which reduces the tendency of a rope to rotate about its axis under load. Usually, this consists of an inner system of core strands laid in one direction covered by an outer system of strands laid in the opposite direction.

RPE. A registered professional engineer licensed under RCW 18.43.040(1).

RPSE. A registered professional structural engineer licensed under RCW 18.43.040(1).

Running wire rope. A wire rope that moves over sheaves or drums.

Runway. A firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

Safety devices. Examples of safety devices are, but are not limited to, the following: Horn, boom/jib or trolley stops, crane level indicator, hydraulic holding device/check valve, rail clamps, rail stops, brakes, deadman control or forced neutral return control, emergency stop switch, guards, handrails, audible and visual alarms, etc.

Safety or health standard. A standard adopted under this chapter.

Section. A section of this part, unless otherwise specified.

Side-boom crane. A track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering, or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.

Sling. An assembly to be used for lifting when connected to a lifting mechanism. The upper portion of the sling is connected to the lifting mechanism and the lower supports the load, as described in this part.

Special hazard warnings. Warnings of site-specific hazards (for example, proximity of power lines).

Spiral. A single transverse coil that is the basic element from which metal mesh is fabricated.

Stability (flotation device). The tendency of a barge, pontoons, vessel, or other means of flotation to return to an upright position after having been inclined by an external force.

Stabilizer. An extendable or fixed member attached to the mounting base to increase the stability of the crane, but that may not have the capability of relieving all of the weight from the wheels or tracks.

Standard method. The hand signals established in the applicable ASME B30 series and WAC 296-155-56400, Mobile crane hand signal chart.

Standing wire rope. A supporting wire rope which maintains a constant distance between the points of attachment to the two components connected by the wire rope.

Superstructure. See upperworks.

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

Taglines. A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.

Tender. An individual responsible for monitoring and communication with a diver.

Tilt up or tilt down operation. Raising/lowering a load from the horizontal to vertical or vertical to horizontal.

Toe board. A vertical barrier at foot level, along the edges of the platform, to protect against material from falling over the edge.

Top rail. The top member of a barrier along the edges of a platform to protect against persons from falling off the platform.

Tower crane. A type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with a luffing jib and/or tower attachments are not considered tower cranes under this part.

Travel. The function of the hoisting equipment moving under its own power from one location to another.

Travel bogie (tower cranes). An assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.

Trim. The angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of flotation.

Two blocking. A condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component. This binds the system and continued application of power can cause failure of the hoist rope or other component.

Unavailable procedures. Procedures that are no longer available from the manufacturer, or have never been available from the manufacturer.

Upperstructure. See upperworks.

Upperworks. The revolving frame of equipment on which the operating machinery (and many cases the engine) are mounted along with the

operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.

Up to. Means "up to and including."

Vertical hitch. A method of rigging a sling in which the load is attached to the loop eye or end fitting at one end of the sling and the loop eye or end fitting at the other end is attached to the lifting device. Any hitch less than 5 degrees from the vertical may be considered a vertical hitch.

Wire rope. A flexible rope constructed by laying steel wires into various patterns of multiwired strands around a core system to produce a helically wound rope.

Working load. The external load applied to the hoisting equipment, including the personnel lifting platform, its contents, and the load attaching equipment, such as lowered load block, shackles, and slings.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-53200 General inspection criteria, wire rope inspection and removal criteria, and preproof load test requirements for all cranes. (1) The accredited crane certifier must review the following documents as part of the crane certification process:

(a) Crane maintenance records of critical components to ensure maintenance of these components has been performed in accordance with the manufacturer's recommendations.

(b) Crane monthly and annual inspection documentation.

(2) **Safety devices.** Make sure all safety devices are installed on equipment in accordance with the requirements located in WAC 296-155-53410.

(3) **Operational aids.** Operations must not begin unless operational aids are in proper working order, except where the owner or lessee meets the specified temporary alternative measures. See WAC 296-155-53412 for the list of operational aids.

Note: All accredited crane certifiers must meet and follow the requirements relating to fall protection, located in chapter ((296-155-WAC, Part C-1, Fall restraint and fall arrest)) 296-880 WAC, Unified safety standards for fall protection.

(4) **General.**

(a) The accredited crane certifier must determine that the configurations of the crane are in accordance with the manufacturer's equipment criteria.

(b) Where the manufacturer equipment criteria are unavailable, a registered professional engineer (RPE), familiar with the type of equipment involved, must ensure criteria are developed for the equipment configuration.

(5) **Wire rope.**

(a) Wire ropes must meet the crane or wire rope manufacturer's specifications for size, type and inspection requirements. In the absence of the manufacturer's specifications, follow the requirements for removal criteria located in this section, including Table 1.

Table 1 - Wire Rope Inspection/Removal Criteria

(See also Figure 1 - Wire Rope)

Category of Crane Types	Running Ropes* # of broken wires in		Rotation Resistant* # of broken wires in		Standing Ropes* # of broken wires	
	1 rope lay	1 strand in 1 lay	Specified diameters		In 1 lay beyond end connection	At end connection
Mobile	6	3	2 (in 6xd)	4 (in 30xd)	3	2
Articulating	6	3	Consult rope mfg.	Consult rope mfg.	3	2
Tower	12	4	2 (in 6xd)	4 (in 30xd)	3	3
Self-Erector	6	3	2 (in 6xd)	4 (in 30xd)	3	2
Overhead & Bridge	12	4	2 (in 6xd)	4 (in 30xd)	—	—
Derricks	6	3	Consult rope mfg.	Consult rope mfg.	3	2

* Also remove if you detect 1 wire broken at the contact point with the core or adjacent strand; so called valley breaks or evidence from any heat damage from any cause.

Note: xd means times the "diameter."

(b) The accredited crane certifier must perform a complete and thorough inspection covering the surface of the working range plus 3 additional wraps on the drum of the wire ropes.

(c) If a deficiency is identified, an immediate determination must be made by the accredited crane certifier as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the crane must not be certified until:

(i) The wire rope is replaced and verified by the accredited crane certifier; or

(ii) If the deficiency is localized, the problem is corrected by severing the wire rope; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited.

(d) Remove wire rope from service if reduction from nominal diameter is greater than 5%.

(e) Replacement rope must be of a compatible size and have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer.

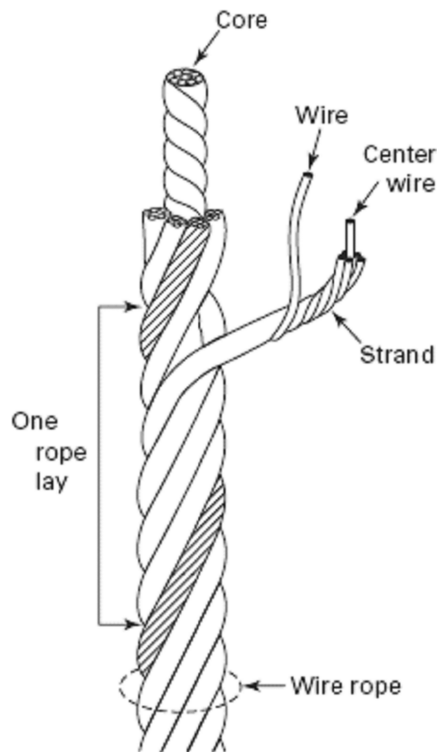


Figure 1 - Wire Rope

(6) Sheaves .

(a) Sheave grooves must be free from surface defects that could damage the rope. The cross-sectional radius at the bottom of the groove should be such as to form a close fitting saddle for the size of rope used. The sides of the groove must be tapered outward and rounded at the rim to facilitate entrance of the rope into the groove. Flange rims must run true about the axis of rotation.

(b) Sheave guards must be in place to:

(i) Guide the rope back into the sheave groove, when using ropes that can be momentarily unloaded.

(ii) Prevent ropes from becoming fouled when the block is lying on the ground with loose ropes.

(c) Sheave bearings, except for permanently lubricated ones, must have a means of lubrication.

(7) Prior to performing a proof load test:

(a) A safe test area must be selected and all traffic and unauthorized personnel and equipment must be cleared from test area. This test area must be roped off or otherwise secured to prevent entry of unauthorized personnel and equipment;

(b) Rigging gear must be inspected by a qualified person prior to using for load test of crane;

(c) You must ensure all load test personnel understand the safety procedures of the test;

(d) Proof load tests, with the exception of tower cranes, are overload tests and extreme caution must be observed at all times. Personnel must remain clear of suspended loads and areas where they could be struck in the event of boom failure. The test load must be raised only to a height sufficient to perform the test;

(e) During tests, safe operating speeds must be employed. Rated speeds in accordance with manufacturer's specifications need not be

attained. Emphasis must be placed on the ability to safely control loads through all motions at normal speeds;

(f) Proof load tests require the use of freely suspended certified weights, or scaled weights using a certified scale with a current certificate of calibration; however, line pull test can be accomplished using a static test and a certified scale with a current certificate of calibration;

(g) Proof load tests must not exceed the manufacturer's specifications. Where these specifications are unavailable, a registered professional engineer familiar with the type of equipment involved must develop written specifications.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-53400 General requirements. (1) All cranes and derricks covered under this part, except for those exempted in WAC 296-155-52900(3), must be certified annually by an accredited certifier recognized by the department, for detailed information about this certification see WAC 296-155-532.

(2) All crane and derrick operators covered under this part, except for those exempted in WAC 296-155-52900(3), must be qualified as required by WAC 296-155-533.

(3)(a) Cranes must meet the requirements for design, construction, installation and testing as prescribed in the applicable ASME standard at the time the crane or derrick was manufactured.

(b) Where manufacturer's specifications are not available the limitations assigned to the crane must be based on the determinations of a registered professional engineer (RPE), competent in this field and such determinations must be appropriately documented and recorded.

(c) Attachments used with cranes must not exceed the capacity, rating, or scope recommended by the manufacturer or RPE.

(4) Unavailable operation procedures.

(a) Where the manufacturer procedures are unavailable, you must develop and ensure compliance with all procedures necessary for the safe operation of the crane/derrick and attachments.

(b) Procedures for the operational controls must be developed by a qualified person.

(c) Procedures related to the capacity of the crane/derrick must be developed and signed by a registered professional engineer familiar with this equipment.

(5) Warning decals and placards must be installed and legible as prescribed by this part and the crane manufacturer.

(6) The procedures applicable to the operation of the crane/derrick including a legible and applicable operator's manual and load rating chart, written in the English language with customary grammar and punctuation, must be in the operator's cab or station when the crane is in operation. Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.

(7) Rated capacity and related information. The information available in the operator's cab or station (see WAC 296-155-53400(6))

regarding "rated capacity" and related information must include, at a minimum, the following information:

(a) A complete range of the manufacturer's rated capacities, as follows:

(i) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset).

(ii) Alternate ratings for use and nonuse of optional equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights.

(iii) When available from the manufacturer load ratings where structural competence governs lifting performance must be identified.

(b) A work area chart for which capacities are listed in the load chart.

Note: An example of this type of chart for mobile cranes is in WAC 296-155-56435.

(c) The work area figure and load chart must clearly indicate the areas where no load is to be handled.

(d) Recommended reeving for the hoist lines must be shown.

(e) Recommended parts of hoist reeving, size, and type of wire rope for various crane loads.

(f) Recommended boom hoist reeving diagram, where applicable; size, type, and length of wire rope.

(g) Tire pressure (where applicable).

(h) Caution or warnings relative to limitations on cranes and operating procedures, including an indication of the least stable direction.

(i) Position of the gantry and requirements for intermediate boom suspension (where applicable).

(j) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered.

(k) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these.

(l) The maximum telescopic travel length of each boom telescopic section.

(m) Whether sections are telescoped manually or with power.

(n) The sequence and procedure for extending and retracting the telescopic boom section.

(o) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions.

(p) Hydraulic relief valve settings specified by the manufacturer.

(8) All manufacturer procedures applicable to the operational functions of cranes/derricks, including its use with attachments must be complied with.

(9) The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the crane/derrick, such as the use of cellular phones (other than when used for signal communications).

(10) A portable fire extinguisher, with a basic minimum extinguisher rating of 10 BC, must be installed in the cab or at the machinery housing. Additional requirements relating to portable fire extinguishers can be found in WAC 296-800-300.

(11) **Cabs.** Cranes/derricks with cabs must meet the following requirements:

(a) Cabs must be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper.

(b) Cab doors (swinging, sliding) must be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator must open outward. Sliding operator doors must open rearward.

(c) **Windows.**

(i) The cab must have windows in front and on both sides of the operator. Forward vertical visibility must be sufficient to give the operator a view of the boom point at all times.

(ii) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure.

(iii) Windows must be of safety glass or material with similar optical and safety properties that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment.

(d) A clear passageway must be provided from the operator's station to an exit door on the operator's side.

(e) Areas of the cab roof that serve as a workstation for rigging, maintenance, or other equipment-related tasks must be capable of supporting 250 pounds without permanent distortion.

(12) Personal belongings must be stored in such a manner as to not interfere with access or operation of the crane.

(13) Rigging gear, tools, oil cans, waste, and other articles must be stored in the toolbox or another appropriate location, and must not be permitted to lie loose in or about the cab or operator's work station.

(14) Operating controls must be properly marked to indicate the function of the controls in each position.

(15) You must designate a competent person who must inspect the cranes and components daily when used, and periodically during use to make sure it is in safe operating condition. Any deficiencies that affect the safe operation of the crane must be repaired, or defective parts replaced, before continued use.

Note: For additional requirements relating to inspections see WAC 296-155-53405.

(16) Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.

(17) While in operation, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment must be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding must meet the requirements of chapter 296-806 WAC, Machine safety.

(18) Neither the load nor the boom is allowed to be lowered below the point where less than two full wraps of rope remain on their respective drums.

(19) All exhaust pipes, turbochargers, and charge air coolers must be guarded or insulated in areas where contact by employees is

possible in the performance of normal duties and are discharged in a direction away from the operator.

(20) Hydraulic and pneumatic lines must be protected from damage to the extent feasible.

(21) **Friction mechanisms.** Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they must be:

(a) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving.

(b) Adjustable to permit compensation for lining wear to maintain proper operation.

(22) Hydraulic load hoists. Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent load hoist movement in the event of hydraulic failure.

(23) Whenever internal combustion engine powered crane/derrick exhausts in enclosed spaces, tests must be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. (See chapter 296-62 WAC, General occupational health standards and chapter 296-841 WAC, Airborne contaminants.)

(24) If access to the cab roof is necessary, a ladder or steps must be provided to give access to a cab roof.

(25) All steps, running boards, and ladders must be of substantial construction and in good repair at all times.

(26) Guardrails, handholds, and steps must be provided on cranes for easy access to the cab in accordance with (~~Parts C-1 and~~) chapter 296-880, Unified safety standards for fall protection Part J of this chapter.

(27) Platforms and walkways must have antiskid surfaces.

(28) Cranes/derricks fuel tank filler pipe must be located in such a position, or protected in such a manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any crane being fueled. In addition, cranes/derricks must be refueled as follows:

(a) Make sure the engine is turned off before refueling.

(b) When refueling with gasoline using portable containers, make sure only an approved safety-type can with an automatic closing cap and flame arrester is used.

(c) Smoking or open flames is prohibited in the refueling area.

(29) **Crane hook ball assemblies and load blocks.**

(a) Load hooks (including latched and unlatched types), ball assemblies, and load blocks must be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use.

(b) Crane hooks must be equipped with latches or self-locking devices unless a qualified person determines that it is safer to hoist and place the load without latches (or with the latches removed/tied back or otherwise disabled) and routes for the loads are preplanned to ensure that no employee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load.

(c) The latch or self-locking device (when used) must bridge the throat opening of the hook for the purpose of retaining slings or other lifting devices under slack conditions.

(30) Repair or replace a hook when it shows:

(a) Any cracks, nicks, or gouges.

(b) Wear of more than 10% of the original sectional dimension, or as recommended by the manufacturer.

(c) Any visibly apparent bend or twist from the plane of the unbent hook.

(d) Any distortion causing an increase in the throat opening of 5%, not to exceed 1/4 inch or as recommended by the manufacturer.

(e) Repair or replace hook latches or self-locking devices when they become inoperative.

(31) A qualified person must determine if a damaged hook needs to be replaced or can be repaired.

(32) When repairing a hook, the requirements below must be followed:

(a) Unless otherwise recommended by the manufacturer, only a qualified person can repair cracks, nicks and gouges by grinding longitudinally, following the contour of the hook.

Note: The dimension of the hook cannot be reduced more than 10% of its original value, unless otherwise recommended by the manufacturer.

(b) All other repairs must be performed by the hook manufacturer or the qualified person.

(c) Weld repairs or reshaping must not be performed on hooks, unless approved by the manufacturer.

(33) Replacement parts, such as load pins for clevis hooks must be at least equal to the original manufacturer's specifications.

Note: For requirements relating to wedge sockets, see WAC 296-155-56115(2).

(34) Before traveling a crane with a load, it must be determined that this practice is not prohibited by the manufacturer. If not, a qualified person must be responsible for the operation. Decisions such as the necessity to reduce crane ratings, load position, boom location, ground support, travel route, and speed of movement must be in accordance with that person's determination. Specified tire pressure must be maintained. The boom should be carried in line with the direction of travel. Sudden starts and stops should be avoided.

(35) The crane/derrick must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent as determined by a competent person, so that, in conjunction (if necessary) with the use of supporting materials, the crane/derrick manufacturer's specifications for adequate support and degree of level of the crane/derrick are met. The requirement for the ground to be drained does not apply to marshes/wetlands. For additional requirements for self-erecting tower cranes, see WAC 296-155-54100.

(36) The controlling entity must:

(a) Ensure that ground preparations necessary to meet the requirements in subsection (35) of this section are provided.

(b) Inform the user of the crane/derrick and the operator of the location of hazards beneath the crane/derrick set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) if they are available to the controlling entity that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.

(37) If there is no controlling entity for the project, the requirement in subsection (36)(a) of this section must be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet subsection (35) of this section.

(38) If the assembly/disassembly director or the operator determines that ground conditions do not meet the requirements in subsection (35) of this section, that person's employer must have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materi-

als/devices (if necessary), the requirements in subsection (35) of this section can be met.

(39) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 C.F.R. Part 213, and that comply with applicable Federal Railroad Administration requirements.

(40) Multiple crane/derrick coordination. Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.

(41) **Multiple crane or multiple load line lifts.**

(a) **Plan development.** Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load or multiple load lines on one crane will be supporting the load, the operation must be planned. The planning must meet the following requirements:

(i) The plan must be developed by a qualified person.

(ii) The plan must be designed to ensure that the requirements of this part are met.

(iii) Where the qualified person determines that engineering expertise is needed for the planning, you must ensure that it is provided.

(b) **Plan implementation.**

(i) The multiple-crane/derrick lift or multiple load line lifts must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (lift director).

(ii) The lift director must review the plan in a meeting with all workers who will be involved with the operation.

(42) **Work area control.** Swing radius hazards.

(a) The requirements in (b) of this subsection apply where there are accessible areas in which the crane's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of:

(i) Striking and injuring an employee; or

(ii) Pinching/crushing an employee against another part of the crane or another object.

(b) To prevent employees from entering these hazard areas, you must:

(i) Train each employee assigned to work on or near the crane (authorized personnel) in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.

(ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas.

Exception:

When you can demonstrate that it is neither feasible to erect such barriers on the ground nor on the crane, the hazard areas must be clearly marked by a combination of warning signs (such as Danger-Swing/Crush Zone) and high visibility markings on the crane that identify the hazard areas. In addition, you must train each employee to understand what these markings signify.

(c) **Protecting employees in the hazard area.**

(i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location.

(ii) Where the operator knows that an employee went to a location covered by subsection (43)(c)(i) of this section, the operator must

not rotate the superstructure until the operator is informed in accordance with a prearranged system of communication that the employee is in a safe position.

(d) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.

(43) Keeping clear of the load.

(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used to the extent consistent with public safety.

(b) While the operator is not moving a suspended load, no employee is allowed to be within the fall zone, except for employees:

(i) Engaged in hooking, unhooking or guiding a load; or

(ii) Engaged in the initial attachment of the load to a component structure; or

(iii) Operating a concrete hopper or concrete bucket.

(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure, and are within the fall zone, all of the following criteria must be met:

(i) The materials being hoisted must be rigged to prevent unintentional displacement.

(ii) Hooks with self-closing latches or their equivalent must be used, see subsection (29)(b) of this section. "J" hooks are permitted to be used for setting wooden trusses.

(iii) The materials must be rigged by a qualified rigger.

(d) Receiving a load. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.

(e) During a tilt-up or tilt-down operation:

(i) Employees are not allowed to be directly under the load.

(ii) Only employees' essential to the operation are allowed to be in the fall zone (but not directly under the suspended load).

Note: An employee is essential to the operation if the employee is conducting one of the following operations and you can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone:

- Physically guide the load;
- Closely monitor and give instructions regarding the load's movement; or
- Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).

(f) Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load. See subsections (44) through (47) of this section.

(44) Boom free fall prohibitions.

(a) The use of cranes in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances:

(i) An employee is in the fall zone of the boom or load.

(ii) An employee is being hoisted.

(iii) The load or boom is directly over a power line, or over any part of the area listed in Table 4 located in WAC 296-155-53408, clearance distance to each side of the power line; or any part of the area extending the Table 4 clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load.

(iv) The load is over a shaft, except where there are no employees in the shaft.

(v) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load.

(vi) Lifting operations are taking place in a refinery or tank farm.

(b) The use of cranes in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in (a) of this subsection are present and:

(i) The crane was manufactured prior to October 31, 1984; or

(ii) The crane is a floating crane or a land crane on a vessel/flotation device.

(45) **Preventing boom free fall.** Where the use of a crane with a boom that is designed to free fall (live boom) is prohibited (see subsection (44)(a) of this section), the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:

(a) Friction drums must have:

(i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.

(ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device).

(b) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.

(c) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this part.

(d) Hydraulic boom cylinders must have an integrally mounted holding device.

(46) **Preventing uncontrolled retraction.** Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.

(47) **Load line free fall.** In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:

(a) **An employee is directly under the load.**

(b) **An employee is being hoisted.**

(c) The load is directly over a power line, or over any part of the area listed in Table 4, located in WAC 296-155-53408, clearance distance to each side of the power line; or any part of the area extending the Table 4 of WAC 296-155-53408, clearance distance to each side of the power line is within the radius of vertical travel of the load.

(d) **The load is over a shaft.**

(e) The load is over a cofferdam, except where there are no employees in the fall zone of the load.

(48) You must not allow employees (~~must not be allowed~~) to ride on the hook or load.

(49) The hoist rope must not be wrapped around the load.

(50) All loads must be attached to the hook by means of suitable slings or other devices of sufficient lifting capacity.

(51) When moving a load it must be well secured and balanced in the sling or lifting device before it is lifted more than a few inches.

(52) **Leaving the crane/derrick unattended.** The operator must not leave the controls while the load is suspended, except where all of the following are met:

(a) The operator remains adjacent to the crane/derrick and is not engaged in any other duties.

(b) The load is to be held suspended for a period of time exceeding normal lifting operations.

(c) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions.

(d) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in subsection (43)(b), (d), and (e) of this section, are permitted in the fall zone.

Exemption: The provisions in this section do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the weight of the working gear is negligible relative to the lifting capacity of the equipment as positioned, and the working gear is suspended over an area other than an entrance or exit.

Note: For additional requirements relating to leaving the crane unattended for tower, self-erecting, overhead/bridge and derricks see:

- WAC 296-155-53915, Tower cranes—Operations;
- WAC 296-155-54115, Self-erecting tower cranes—Operations;
- WAC 296-155-54215, Overhead/bridge cranes and gantry cranes—Operations;
- WAC 296-155-54320, Derricks—Operations.

(53) While moving the load the lift and swing path must be clear of obstructions.

(54) Before starting to lift the following conditions must be met:

(a) The hoist rope must not be kinked.

(b) Multiple-part lines must not be twisted around each other.

(c) The hook must be brought over the load in such a manner as to minimize swinging.

(d) If the competent person determines that there is slack rope condition requiring respooling of the rope, it must be verified (before starting the lift) that the rope is seated on the drum and in the sheaves as the slack is removed.

(e) The competent person must adjust the crane/derrick and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.

(f) If possible, the load must be free to be lifted; it is neither caught nor attached to other objects.

(55) During lifting operations, care must be taken that there is no sudden acceleration or deceleration of the moving load and that the load boom or other parts of the crane do not contact any obstruction. Rotational speed of the crane/derrick must be such that the load does not swing out beyond the radius at which it can be controlled.

(56) Side loading of booms (jibs) must be limited to freely suspended loads. Cranes must not be used for dragging loads sideways.

(57) The operator must test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.

(58) Modifications or additions which affect the capacity or safe operation of the crane/derrick are prohibited except where the requirements of (a) or (b) of this subsection are met. For recertification requirements see WAC 296-155-53214 (1)(c).

(a) Manufacturer review and approval.

(i) The manufacturer approves the modifications/additions in writing.

(ii) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition.

(iii) The original safety factor of the crane/derrick is not reduced.

(b) Where manufacturer is unavailable or has refused to review a request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met:

(i) A registered professional engineer who is a qualified person with respect to the crane/derrick involved:

(A) Approves the modification/addition and specifies the crane/derrick configurations to which that approval applies; and

(B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition.

(ii) The original safety factor of the crane/derrick is not reduced.

(c) Manufacturer does not complete the review within 120 days of the request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of subsection (58)(b)(i) and (ii) of this section are met.

(d) Multiple manufacturers of equipment designed for use on marine worksites. The equipment is designed for marine worksites, contains major structural components from more than one manufacturer, and the requirements of subsection (58)(b)(i) and (ii) of this section are met.

(59) You must not make any modifications or additions which affect the capacity or safe operation of the crane without the manufacturers' written approval. If components of more than one crane manufacturer are being combined, you must obtain written approval from all manufacturers prior to use. If the manufacturer(s) is/are not available a registered professional structural engineer's (RPSE) written approval must be obtained. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly. In no case must the original safety factor of the crane be reduced.

Note: The provisions in subsections (58) and (59) of this section do not apply to modifications made or approved by the U.S. military.

(60) All applicable controls must be tested by the operator at the start of a new shift, if possible. If any controls fail to operate properly, they must be adjusted or repaired before operations are initiated.

(61) Except for proof load testing required under WAC 296-155-53202 through 296-155-53212, no crane/derrick is permitted to be loaded beyond the specifications of the load rating chart, unless authorized by the crane manufacturer. The operator must not be required to operate the crane/derrick in a manner that would violate this requirement.

(62) **Load weight.** The operator must verify that the load is within the rated capacity of the crane/derrick by at least one of the following methods:

(a) The weight of the load must be determined from a reliable source recognized by the industry (such as the load's manufacturer), or by a reliable calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information must be provided to the operator prior to the lift; or

(b) The operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter. If the load exceeds 75% of the maximum rated capacity at the longest radius that will be used during the lift operation, the operator must not proceed with the lift until it is verified that the weight of the load is in accordance with (a) of this subsection.

(63) Tag lines or restraint lines must be used when rotation or swinging of the load is hazardous or if the load needs guidance. Tag lines are not required when all of the following criteria are met:

- The suspended load can be expected to remain still when in a static (nonmoving) condition or does not swing or rotate in a hazardous manner;

- The movement of the crane or boom cannot be expected to cause the load to swing or rotate in an uncontrolled manner that may create a hazard;

- The operator is in control of the movement of the load and a hazardous condition is not created.

(64) All brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.

(65) Safety devices and/or operational aids must not be used as a substitute for the exercise of professional judgment by the operator.

(66) **Storm warning.** When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the crane/derrick.

(67) Whenever there is a concern as to safety, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.

(68) **Tag-out.**

(a) Tagging out of service. Where you have taken the crane/derrick out of service, a tag must be placed in the cab or at the operator station stating that the equipment is out of service and is not to be used. Where you have taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.

(b) **Response to do not operate/tag-out signs.**

(i) If there is a warning (tag-out or maintenance/do not operate) sign on the crane/derrick or starting control, the operator must not activate the switch or start the crane/derrick until the sign has been removed by a person authorized to remove it, or until the operator has verified that:

(A) No one is servicing, working on or otherwise in a dangerous position around the machine.

(B) The crane/derrick has been repaired and is working properly.

(ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate that switch or control until the sign has been removed by a per-

son authorized to remove it, or until the operator has verified that the requirements in (b)(i)(A) and (B) of this subsection have been met.

Note: For additional lockout/tagout procedures for electrical circuits, see WAC 296-155-429.

(69) If crane/derrick adjustments or repairs are necessary:

(a) The operator must, in writing, promptly inform the person designated by you to receive such information and, where there are successive shifts, to the next operator; and

(b) You must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.

(70) All cranes and derricks mounted on barges or other floating structures must meet the requirements as outlined in ASME B30.8-2004 for construction, installation, inspection, maintenance and operation.

(71) **Swinging locomotive cranes.** A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.

(72) **Remote control cranes/derricks.** Before an operator leaves the crane/derrick to operate remotely, the operator must ensure that the crane/derrick will be used in accordance with the manufacturer's recommendations. Provisions must be made to prevent simultaneous activation of controls when more than one control station (remote control) is provided.

(73) Remote-operated cranes/derricks must function so that if the control signal for any crane/derrick motion becomes ineffective, the crane/derrick motion must stop.

(74) Remote-operated cranes/derricks must be equipped with an "emergency stop" system, located at the operator's remote station to provide the means to remove power from the crane in the event of a malfunction.

(75) A preventative maintenance program must be established based on the recommendation of the crane/derrick manufacturer. If manufacturer's recommendations are not available, then those of a qualified person must be followed. Dated records must be kept available.

(76) **Working with a diver.** You must meet the following additional requirements when working with a diver in the water:

(a) If a crane/derrick is used to get a diver into and out of the water, it must not be used for any other purpose until the diver is removed from the water. When used for more than one diver, it must not be used for any other purpose until all divers are all out of the water.

(b) The operator must remain at the controls of the crane/derrick at all times.

(c) In addition to the requirements in WAC 296-155-53406, Signals, either:

(i) A clear line of sight must be maintained between the operator and dive tender; or

(ii) The signals between the operator and dive tender must be transmitted electronically.

WAC 296-155-53403 Fall protection. (1) Application.

(a) Subsections (2), (3)(b), (5) and (6) of this section apply to all cranes/derricks covered by this part except tower cranes.

(b) Subsections (3)(a), (4), (7), (10) and (11) of this section apply to all cranes/derricks covered by this part.

(c) Subsections (3)(c) and (9) of this section apply only to tower cranes.

(2) Boom walkways.

(a) Cranes/derricks manufactured after the effective date of this section with lattice booms must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet.

(b) **Boom walkway criteria.** The walkways must be at least 12 inches wide.

(3) Steps, handholds, ladders, grabrails, guardrails and railings.

(a) All steps, handholds, ladders and guardrails/railings/grabrails must be maintained in good condition.

(b) Cranes/derricks manufactured after the effective date of this section must be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria:

(i) Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of SAE J185 (May 2003) or ISO 11660-2:1994(E) except where infeasible.

(ii) Walking/stepping surfaces, except for crawler treads, must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(c) Tower cranes manufactured after the effective date of this section must be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria:

(i) Steps, handholds, ladders, and guardrails/railings/grabrails must meet the criteria of ISO 11660-1:2008(E) and ISO 11660-3:2008(E) or SAE J185 (May 2003) except where infeasible.

(ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(4) Personal fall arrest and fall restraint systems must conform to the criteria in (~~WAC 296-155-24510. Body harnesses must be used in personal fall arrest and fall restraint systems~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(5) For nonassembly/disassembly work, you must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows:

(a) When moving point-to-point:

(i) On nonlattice booms (whether horizontal or not horizontal).

(ii) On lattice booms that are not horizontal.

(iii) On horizontal lattice booms where the fall distance is 10 feet or more.

(b) While at a work station on any part of the crane (including the boom, of any type).

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(6) For assembly/disassembly work, you must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 10 feet above a lower level.

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(7) **Anchorage criteria.**

(a) Anchorages used for attachment of personal fall arrest equipment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or must be designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

(ii) Under the supervision of a qualified person.

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

(c) Anchorages for personal fall arrest and positioning device systems.

(i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in (a) of this subsection would not be met.

(ii) Positioning device systems must be anchored to any apparently substantial part of the crane unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in (b) of this subsection would not be met.

(iii) Attachable anchor devices (portable anchor devices that are attached to the crane) must meet the anchorage criteria in (a) of this subsection for personal fall arrest systems and (b) of this subsection for positioning device systems.

(8) **Anchorages for fall restraint systems.** Fall restraint systems must be anchored to any part of the crane that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.

(9) **Tower cranes.**

(a) For work other than erecting, climbing, and dismantling, you must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level.

Note: If the equipment is running and the employee is at or near the draw-works, precautions should be taken to ensure the fall protection gear will not become entangled.

(b) For erecting, climbing, and dismantling work, you must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 10 feet above a lower level.

(10) **Anchoring to the load line.** A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met:

(a) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in subsection (7)(a) of this section.

(b) The crane operator must be at the worksite and informed that the crane is being used for this purpose.

(c) No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).

(11) **Training.** You must train each employee who may be exposed to fall hazards while on, or hoisted by, cranes/derricks covered by this section on all of the following:

(a) The requirements in this part that address fall protection.

(b) The applicable requirements in (~~Parts C-1 and~~) chapter 296-880 WAC, Unified safety standards for fall protection and Part K of this chapter.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-53900 Tower cranes—General. (1) This section contains supplemental requirements for tower cranes; all sections of this part apply to tower cranes unless specified otherwise. In addition, the requirements in WAC 296-155-53402 apply unless otherwise specified, except that the term "assembly/disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."

(2) All tower cranes in use must meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed by the manufacturer. If the manufacturer's recommendations are not available, follow the requirements in ASME B30.3-2009. It is not the intent of this rule to require retrofitting of existing cranes. However, when an item is being modified, its performance needs to be reviewed by a qualified person and compared to the applicable sections of this rule. For modification requirements see WAC 296-155-53400 (58) and (59). For cranes manufactured prior to the effective date of this rule the design and construction criteria must meet at a minimum, ASME B30.3-1990.

(3) You must follow the manufacturer's recommendations when installing, erecting, and dismantling tower cranes. If the manufacturer's recommendations are not available, follow the requirements in ASME B30.3-2009.

(4) When cranes are erected/dismantled, written instructions by the manufacturer or qualified person and a list of the weights of each subassembly to be erected/dismantled must be at the site.

(5) A qualified person must supervise the erection, jumping and dismantling of the crane.

(6) You must establish procedures before beginning crane erection/dismantling work to implement the instructions and adapt them to the particular needs of the site.

(7) Tower cranes and tower crane assembly parts/components must be inspected by an accredited certifier, prior to assembly, following erection of the tower crane, after each climbing operation, or recon-

figuring the boom, jib, or counterjib, before placing the crane in service. (See WAC 296-155-53206.) You must only use inspected and pre-approved components in the assembly of a tower crane.

(8) You must erect tower masts plumb to a tolerance of 1:500 (approximately one inch in 40 feet) unless the manufacturer specifies otherwise and verified by a qualified person.

(9) You must install cranes that are required to weathervane when out-of-service with clearance for the boom (jib) and the superstructure to swing through a full 360 degree arc. You must maintain clearances recommended by the crane manufacturer between other weathervaning cranes and fixed objects.

(10) When the crane is out of operation, the jib or boom must be pointed downwind and the slewing brake must be released so as to permit the jib or boom to weathervane, provided the jib or boom has a clear 360 degree rotation.

(11) When the crane is out of operation and a 360 degree rotation is not feasible, you must follow the manufacturer's or RPE's written procedures for restraining the jib or boom from rotation.

(12) 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.

(13) Prior to erecting a tower crane on a nonstandard tower crane base/structural support, you 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.

(14) An RPSE must certify that the crane foundation, structural supports and underlying soil provide adequate support for the tower crane with its applied torsional and overturning moments and the horizontal and vertical forces.

(15) The controlling entity that installed the tower crane foundations and structural supports must provide a written statement/documentation to the A/D director stating that they were installed in accordance with their design and requirements the RPE, and the engineer of record if applicable.

(16) You must consult the engineer of record to verify that the host structure is capable of safely resisting the applied crane forces, if this engineer is not available an RSPE must perform this verification. When inside climbing cranes are used, the integrity of the host structure must be reviewed and approved by an RPSE, for the effects of the crane, load, and wind forces at each level of the structure.

(17) Prior to installing a tower crane that will be attached to an existing building, new construction, or structure, an RPSE must certify that the structural attachment to the building is designed to withstand the torsional and overturning moments and the horizontal and vertical forces created by the crane to be installed.

(18) The assembly/disassembly director must address backward stability before slewing, traveling or freestanding tower cranes on ballasted bases.

(19) The top of the support/foundation must be accessible and free of debris, materials and standing water. No materials can be stored on the support unless approved by a qualified person. Tower crane's foundation and fasteners must remain accessible and visible for inspection at all times.

(20) You must not climb tower cranes in concrete structures until the concrete at the levels at which horizontal and vertical supports are to be placed has reached sufficient strength to resist the crane reactions. It may be necessary to test concrete cylinders or cores or to use on-site testing techniques for this purpose.

(21) Climbing jack systems used for raising a tower crane must be equipped with over-pressure relief valves, direct-reading pressure gauges, and pilot-operated hydraulic check valves installed in a manner which will prevent the jack from retracting should a hydraulic line or fitting rupture or fail.

(22) Before climbing or erecting/dismantling, you must balance cranes in accordance with the manufacturer's or a qualified person's instructions. If no such limit has been set, wind velocity must not exceed the limit set by the manufacturer, or 20 miles per hour as indicated by a wind velocity device mounted near the top of the crane. The crane operator must be present during climbing or erecting/dismantling operations.

(23) You must not commence climbing operations until all crane support provisions at the new support level are in place as per the manufacturer's recommendations or as specified by an RPSE.

(24) Crane superstructures and counterjibs (counterweight jib) must be arranged to receive counterweights, made in accordance with the manufacturer's specifications for the specified jib or boom length, and to hold them in position. You must provide means to guard against shifting or dislodgement during crane operation. Manufacturer's specified counterweight weights are not to be exceeded.

(25) Moveable counterweights, if provided, must either move automatically or must be equipped with a position indicator with read out at the operator's station(s).

(26) When counterweight position is controlled by wire ropes, you must provide means to prevent uncontrolled movement in the event of wire rope or wire rope termination failure.

(27) When counterweight position is controlled by wire ropes and/or linkages between the counterweight and the boom, you must make provisions to avert structural damage if the boom is moved beyond its normal limits.

(28) For cranes utilizing ballast, bases must include provisions to support and position the ballast. You must provide means to guard against shifting or dislodgement of ballast during crane operation.

(29) All electrical equipment must be properly grounded and protection must be provided against lightning per the manufacturer's recommendation or if not available, a registered professional electrical engineer.

(30) Each electrically powered crane must have a main disconnect switch at or near the initial base of the crane. This switch must have provisions for locking in the "off" position.

(31) You must guard or locate equipment so that live parts are not exposed to inadvertent contact by personnel and equipment under normal operating conditions.

(32) You must protect electrical equipment from dirt, grease, oil, and moisture. Fixtures, wiring, and connections exposed to the weather must be of weather resistant type.

(33) Wiring must conform to the provisions of ANSI/NFPA 70 for temporary wiring. Motors, controls, switches, and other electrical equipment must meet the applicable requirements of ANSI/NFPA 70. Hoists, slewing, trolley, and travel controllers must conform to ISO 7752-1, 2010.

(34) You must make provisions to guard against reversing of each motor due to reversed phase connections.

(35) Electrical circuits between the fixed and rotating portions of the crane must pass through a slip ring assembly that will permit continuous rotation of the upper crane structure in either direction, unless other means are provided to prevent damage to the electrical conductors.

(36) Individual overload protection must be provided for each motor.

(37) Crane trucks must be fitted with sweeps extending below the top of the rail, unless the construction of the rail foundation prohibits such extension, and placed in front of the leading wheels in either direction. Truck wheels/bogies must be guarded.

(38) You must provide a means to limit the drop of truck frames in case of wheel or axle breakage to a distance that will not cause a crane to overturn.

(39) Multiple tower crane job sites. On job sites where more than one tower crane is installed, you must locate the cranes such that no crane may come in contact with the structure of another crane. Crane's jibs or booms are permitted to pass over one another.

(40) You must position tower cranes, in service, whereby they can slew 360 degrees without either the counterjib or jib/boom striking any building, structure, or other object, unless:

(a) Suitable anticollision devices are installed which will prohibit contact with such objects or;

(b) Direct voice communications are established between any operator of the tower crane(s) involved and a 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.

(i) You must establish a secondary means of positive communications as a back-up for possible direct voice communication failure.

(ii) Radio communication systems without tone coded squelch are prohibited. You must not use citizens band radios as a means of communications for tower cranes.

(41) Limit switches must be installed and you must keep them properly adjusted. You must protect or isolate them in a manner which will prevent unauthorized tampering. Limit switches must provide the following functions:

(a) Limit the travel of the trolley to prevent it from hitting the outer end of the jib.

(b) Limit the upward travel of the load block to prevent two-blocking.

(c) Lower over travel limiting devices must be provided for all load hoists where the hook area is not visible to the operator.

(d) In the absence of the crane manufacturer's specifications, limit the load being lifted in a manner whereby no more than 110% of the maximum rated load can be lifted or moved.

(e) Cranes mounted on rail tracks must be equipped with limit switches limiting the travel of the crane on the track and stops or buffers at each end of the tracks.

(42) All tower cranes manufactured after July 27, 2010, must be equipped with a safety device (also referred to as a limit device) that provides deceleration before the top position of the crane hook is reached.

(43) The load must be free when lifted; it must not be caught on nor attached to other objects. You must limit side loading of jibs to freely suspended loads. You must not use cranes for dragging loads.

(44) When the operator may be exposed to the hazard of falling objects, the tower crane cab and/or remote control station must have adequate overhead protection.

(45) You must provide a safe means for access to the tower, operator's cab and machinery platform.

(46) When necessary for inspection or maintenance purposes, you must provide ladders, walkways with railing or other devices.

(47) All crane brakes must automatically set in event of power failure. Slewing brakes must also function in this manner or be capable of being set manually.

(48) Each tower crane must be provided with a slewing brake capable of holding in both directions preventing the superstructure from rotating during operation and must be capable of being set in the holding position and remaining so without further action on the part of the operator.

(49) The trolley must be provided with an operating brake capable of stopping the trolley in either direction. The system must include a means for holding the trolley without further action on the part of the operator, and must engage automatically if power or pressure to the brake is lost.

(50) In addition to the operating brake, the trolley must be equipped with an automatic braking device capable of stopping trolley in either direction in the event of trolley drive rope breakage, if such ropes are used.

(51) The body or frame of the trolley must be fitted with a means to restrain the trolley from becoming detached from its guide rail(s) in the event of trolley wheel or axle breakage or side loading.

(52) The jib point sheave, if provided, must have at least one broad stripe of bright, contrasting color painted on each side so it can be determined whether or not the sheave is turning.

(53) You must protect employees required to perform duties on the boom/jib of tower cranes against falling in accordance with (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(54) An audible signal must automatically sound whenever the crane travels in order to warn persons in the vicinity.

(55) You must mount a wind velocity indicating device at or near the top of the crane. You must provide a velocity readout at the operator's station in the cab, and a visible or audible alarm must be triggered in the cab and at remote control stations when a preset wind velocity has been exceeded.

(56) When the wind velocity indicating device is not functioning, crane operations may continue if another crane on the site is equipped with a functioning wind velocity indicator or if a qualified person determines that ambient wind velocity is within permitted limits.

(57) You must provide indicating devices to:

(a) Display the magnitude of the load on the hook;

(b) Display the boom angle or operating radius, as appropriate. On hammerhead booms (jibs), radius indication may be by means of flags or markers along the length of the boom (jib) so as to be visible to the operator;

(c) Display ambient wind velocity.

(58) You must provide a limiting device to:

- (a) Decelerate the trolley travel at both ends of the jib prior to the final limit activation;
 - (b) Decelerate the luffing boom travel at upper and lower ends prior to final limit activation;
 - (c) Limit trolley travel at both ends of the jib;
 - (d) Stop boom luffing at lower and upper limits of boom movement;
 - (e) Decelerate the hoist up hook travel prior to final limit activation;
 - (f) Stop load block upper motion before two-blocking occurs;
 - (g) Stop load block downward motion to prevent the last two wraps of wire rope from spooling off the hoist drum;
 - (h) Limit crane travel at both ends of the runway tracks;
 - (i) Limit lifted load;
 - (j) Limit operating radius in accordance with lifted load, i.e., limit movement; and
 - (k) Limit pressures in hydraulic or pneumatic circuits.
- (59) You must lock or seal load limiting devices and acceleration/deceleration limiters when provided with a method to inhibit tampering and unauthorized adjustment.

(60) **Safety devices.**

- (a) The following safety devices are required on all tower cranes unless otherwise specified:
 - (i) Boom stops on luffing boom type tower cranes;
 - (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment;
 - (iii) Travel rail end stops at both ends of travel rail;
 - (iv) Travel rail clamps on all travel bogies;
 - (v) Integrally mounted check valves on all load supporting hydraulic cylinders;
 - (vi) Hydraulic system pressure limiting device;
 - (vii) The following brakes, which must automatically set in the event of pressure loss or power failure, are required:
 - (A) A hoist brake on all hoists;
 - (B) Slewing brake;
 - (C) Trolley brake;
 - (D) Rail travel brake.
 - (viii) Deadman control or forced neutral return control (hand) levers;
 - (ix) Emergency stop switch at the operator's station;
 - (x) Trolley end stops must be provided at both ends of travel of the trolley.
- (b) Proper operation required. You must not begin operations unless the devices listed in this subsection are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. You must take the crane out of service, and you must not resume operations until the device is again working properly. You must not use alternative measures.

(61) **Operational aids.**

- (a) The devices listed in this subsection (operational aids) are required on all tower cranes covered by this part, unless otherwise specified.
- (b) You must not begin crane operations unless the operational aids are in proper working order, except where you meet the specified temporary alternative measures. You must follow more protective alternative measures, if any are specified by the tower crane manufacturer.
- (c) When operational aids are inoperative or malfunctioning, you must follow the crane and/or device manufacturer's recommendations for

operation or shutdown of the crane until the problems are corrected. Without such recommendations and any prohibitions from the manufacturer against further operation, the following requirements apply:

Note: If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under WAC 296-155-53400 (58) and (59).

(i) You must accomplish recalibration or repair of the operational aid as soon as is reasonably possible, as determined by a qualified person.

(ii) **Trolley travel limiting device.** The travel of the trolley must be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the trolley end stops. Temporary alternative measures:

(A) **Option A.** You must mark the trolley rope (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops.

(B) **Option B.** You must use a spotter who is in direct communication with the operator when operations are conducted within 10 feet of the outer or inner trolley end stops.

(iii) **Boom hoist limiting device.** You must limit the range of the boom at the minimum and maximum radius. Temporary alternative measures: Clearly mark the hoist rope (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

(iv) **Anti two-blocking device.** The tower crane must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the hoist rope (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

Note: This temporary alternative measure cannot be used if lifting personnel in a suspended platform.

(v) **Hoist drum lower limiting device.** Tower cranes manufactured after the effective date of this section must be equipped with a device that prevents the last two wraps of hoist cable from being spooled off the drum. Temporary alternative measures: Mark the hoist rope (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last two wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

(vi) **Load moment limiting device.** The tower crane must have a device that prevents moment overloading. Temporary alternative measures: You must use a radius indicating device (if the tower crane is not equipped with a radius indicating device, you must measure the radius to ensure the load is within the rated capacity of the crane). In addition, the weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. You must provide this information to the operator prior to the lift.

(vii) **Hoist line pull limiting device.** You must limit the capacity of the hoist to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. Temporary alternative measures: The operator must ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission).

(viii) **Rail travel limiting device.** You must limit the travel distance in each direction to prevent the travel bogies from running into the end stops or buffers. Temporary alternative measures: You must use a spotter who is in direct communication with the operator when operations are conducted within 10 feet of either end of the travel rail end stops; the spotter must inform the operator of the distance of the travel bogies from the end stops or buffers.

(ix) **Boom hoist drum positive locking device and control.** The boom hoist drum must be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. Temporary alternative measures: You must manually set the device when required if an electric, hydraulic or automatic type is not functioning.

(x) **Boom angle or hook radius indicator.**

(A) Luffing boom tower cranes must have a boom angle indicator readable from the operator's station.

(B) Hammerhead tower cranes manufactured after the effective date of this section must have a hook radius indicator readable from the operator's station. Temporary alternative measures: You must determine hook radii or boom angle by measuring the hook radii or boom angle with a measuring device.

(xi) **Trolley travel deceleration device.** You must automatically reduce the trolley speed prior to the trolley reaching the end limit in both directions. Temporary alternative measures: You must post a notice in the cab of the crane notifying the operator that the trolley travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits.

(xii) **Boom hoist deceleration device.** You must automatically reduce the boom speed prior to the boom reaching the minimum or maximum radius limit. Temporary alternative measures: You must post a notice in the cab of the crane notifying the operator that the boom hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the boom speed when approaching the boom maximum or minimum end limits.

(xiii) **Load hoist deceleration device.** You must automatically reduce the load speed prior to the hoist reaching the upper limit. Temporary alternative measures: You must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the hoist speed when approaching the upper limit.

(xiv) **Wind speed indicator.** You must provide a device to display the wind speed and it must be mounted at or near the top of the crane structure. Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed.

(xv) **Load indicating device.** Cranes manufactured after the effective date of this section, must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this require-

ment. Temporary alternative measures: The weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. You must provide this information to the operator prior to the lift.

(62) You must not install advertising signs or similar panels on the crane or tower unless size, design, and positioning satisfy the manufacturer's recommendations, in the absence of the manufacturer's recommendations, you must obtain an RPE's written approval.

(63) For night operations, lighting must be adequate to illuminate the working areas while not interfering with the operator's vision.

(64) All welding procedures and welding operator qualifications for use in repair or alteration of load sustaining members must be in accordance with ANSI/AWS D14.3 or ANSI/AWS D1.1. Where special steels or other materials are used, the manufacturer or a qualified person must provide welding procedure instructions. The type of metal used for load sustaining members must be identified by the manufacturer. In the absence of the manufacturer you must use an RPSE.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-54300 Derricks—General. (1) This section contains supplemental requirements for derricks, whether temporarily or permanently mounted; all sections of this part apply to derricks unless specified otherwise. A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.

(2) **Derricks.** All derricks in use must meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standard Institute B30.6-2010, Safety Standard for Derricks. It is not the intent of this rule to require retrofitting of existing derricks. However, when an item is being modified, its performance needs to be reviewed by a qualified person and compared to the applicable sections of this rule. For modification requirements see WAC 296-155-53400 (58) and (59). For derricks manufactured prior to the effective date of this rule the design and construction criteria must meet at a minimum, ASME B30.6-1990.

(3) Derricks must be constructed to meet all stresses imposed on members and components when installed and operated in accordance with the manufacturer's/builder's procedures and within its rated capacity.

(4) You must follow the manufacturer's recommendations when installing, erecting, operating, maintenance and dismantling derricks. If the manufacturer's recommendations are not available, follow the requirements in ASME B30.6-2010.

(5) When derricks are erected/dismantled, written instructions by the manufacturer or qualified person and a list of the weights of each subassembly to be erected/dismantled must be at the site.

(6) You must establish procedures before beginning derrick erection/dismantling work to implement the instructions and adapt them to the particular needs of the site.

(7) A qualified person must supervise the erection and dismantling of the derrick.

(8) Derricks and their crane assembly parts/components must be inspected by an accredited certifier, prior to assembly and following erection of the derrick before placing the crane in service (see WAC 296-155-53212). Only inspected and preapproved components are allowed to be used in the assembly of a derrick.

(9) Prior to erecting a derrick on a nonstandard base/structural support, you 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.

(10) An RPSE must certify that the derrick foundation, structural supports and underlying soil provide adequate support for the derrick with its applied torsional and overturning moments and the horizontal and vertical forces.

(11) Derricks must be attached to bases/structural supports in compliance with the manufacturer's or an RPSE's instructions.

(12) Prior to installing a derrick that will be attached to an existing building, new construction, or structure, an RPSE must certify that the structural attachments to the building are designed to withstand the torsional and overturning moments and the horizontal and vertical forces created by the derrick to be installed.

(13) You must consult the engineer of record to verify that the host structure is capable of safely resisting the applied derrick forces, if this engineer is not available an RPSE must perform this verification.

(14) Derrick superstructures and machine deck (counterweight jib/counter-jibs) must be arranged to receive counterweights, made in accordance with the manufacturer's specifications for the specified jib or boom length, and to hold them in position. You must provide means to guard against shifting or dislodgement during derrick operation. Manufacturer's specified counterweight weights are not to be exceeded.

(15) For derricks utilizing ballast, bases must include provisions to support and position the ballast. You must provide means to guard against shifting or dislodgement of ballast during derrick operation.

(16) All electrical equipment must be properly grounded and protection must be provided against lightning per the manufacturer's recommendations or if not available, a registered professional electrical engineer.

(17) Each electrically powered derrick must have a main disconnect switch at or near the initial base of the derrick. This switch must have provisions for locking in the "off" position.

(18) You must locate or guard electrical equipment so that live parts are not exposed to inadvertent contact by personnel and equipment under normal operating conditions.

(19) You must protect electrical equipment from dirt, grease, oil, and moisture. Fixtures, wiring, and connections exposed to the weather must be of weather resistant type.

(20) Wiring must conform to the provisions of ANSI/NFPA 70 for temporary wiring. Motors, controls, switches, and other electrical equipment must meet applicable requirements of ANSI/NFPA 70. Hoists, slewing, trolley, and travel controllers must conform to ISO 7752-1, 2010.

(21) You must make provisions to guard against reversing of each motor due to reversed phase connections.

(22) Electrical circuits between the fixed and rotating portions of the derrick must pass through a slip ring assembly that will permit continuous rotation of the upper derrick structure in either direction, unless other means are provided to prevent damage to the electrical conductors.

(23) Individual overload protection must be provided for each motor.

(24) You must protect employees required to perform duties on the boom/jib of derricks against falling in accordance with (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(25) You must not install advertising signs or similar panels on the derrick unless size, design, and positioning satisfy the manufacturer's recommendations, in the absence of the manufacturer's recommendations, you must obtain an RPE's written approval.

(26) For night operations, lighting must be adequate to illuminate the working radius while not interfering with the operator's vision.

(27) All welding procedures and welding operator qualifications for use in repair or alteration of load sustaining members must be in accordance with ANSI/AWS D14.3 or ANSI/AWS D1.1. Where special steels or other materials are used, the manufacturer or a qualified person must provide welding procedure instructions. The type of metal used for load sustaining members must be identified by the manufacturer. In the absence of the manufacturer you must use an RPSE.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-54800 Design of platforms and suspension systems.

(1) Employers that manufacture personnel platforms and/or their suspension systems must be designed, constructed and tested according to ASME B30.23-2005, Personnel Lifting Systems. The design and manufacturer's specifications must be made by a registered professional engineer. Personnel platforms manufactured prior to the effective of this section must comply with ASME B30.23-1998.

(2) Only the crane/derrick manufacturer may approve the design and installation procedures for platform mounting attachment points on lattice type boom cranes and lattice type boom extensions. The design and installation procedures, for platform mounting attachment points on other types of cranes/derricks must be approved by their manufacturer or an RPE. All approvals must be in writing.

(3) Platform mounting attachments on the crane/derrick must be designed to protect against disengagement during lifting operation.

(4) The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle.

(5) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(6) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least 5 times the maximum intended load.

(7) The personnel platform must be equipped with a guardrail system which meets the requirements of Part C-1 of this chapter, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than one-half inch (1.27 cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(8) You must install a grab rail inside the entire perimeter of the personnel platform except for access gates/doors.

(9) **Access gates/doors.** If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must:

(a) Not swing outward. If due to the size of the personnel platform, such as a one-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward.

(b) Be equipped with a device that prevents accidental opening.

(10) Headroom must be sufficient to allow employees to stand upright in the platform.

(11) In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to one-half inch openings), unless full protection is necessary.

(12) All edges exposed to employee contact must be smooth enough to prevent injury.

(13) An identification plate must be located on the platform. The location must protect against damage and allow easy viewing from both interior (while hoisted) and exterior (while not hoisted) of the platform.

(14) The inspection plate must display the following information:

(a) Manufacturer's name and address;

(b) Platform rating in terms of weight and personnel;

(c) Platform identification number;

(d) Suspension system description for suspended platforms, or the intended crane/derrick manufacturer and model for boom attached platforms;

(e) Weight of the empty platform and its suspension system;

(f) Date the platform was manufactured;

(g) Certification of compliance to the design, construction, and testing requirements of ASME B30.23-2005, Personnel Lifting Systems;

(h) Listing of any unique operational environments for which the platform has been designed.

(15) For suspended platforms, the suspension system must be sized by the platform manufacturer, and its installed sling angle established, so as not to cause damage to the platform. Suspension systems must comply with the following:

(a) Hooks and other detachable devices.

(i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower

load blocks, bridle legs, or other attachment assemblies or components) must be:

(A) Of a type that can be closed and locked, eliminating the throat opening.

(B) Closed and locked when attached.

(ii) Shackles used in place of hooks must be of the alloy anchor type, with either:

(A) A bolt, nut and retaining pin, in place; or

(B) Of the screw type, with the screw pin secured from accidental removal.

(iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in subsection (a) of this section. You must close and lock devices when attached.

(b) When a rope bridle is used to suspend the personnel platform, each bridle leg must be connected to a master link or shackle (see (a) of this subsection) in a manner that ensures that the load is evenly divided among the bridle legs.

(c) Eyes in wire rope slings shall be fabricated with thimbles.

(d) Wire rope sling suspension systems with pored socket end connections, if used, must be designed in accordance with the manufacturer's or qualified person's application instructions.

(e) All sling suspension systems must utilize a master link for attachment to the crane/derrick hook or bolt type shackle with cotter pin.

(f) You must not use synthetic webbing or natural or synthetic fiber rope slings for suspension systems.

(g) Suspension system legs must be designed and sized according to ASME B30.23-2005.

(h) Wire rope sling suspension systems must have each leg of the system permanently marked with the rated load of the leg. The master link in the system must be permanently marked with the suspension system's rated load and identification as a personnel lifting platform suspension component.

(i) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least 5 times the maximum intended load applied or transmitted to that component. A sling made from rotation resistant rope is prohibited.

(j) You must use bridles and associated rigging for suspending the personnel platform only for the platform and the necessary employees, their tools and materials necessary to do their work, and you must not use it for any other purpose when not hoisting personnel.

(16) Overhead protection, when provided for a platform, must allow for a clear view of the crane/derrick components directly overhead, from any position in the platform. Any openings designed in the overhead protection must not allow a sphere of greater than 0.5 in (13 mm) to pass through.

(17) All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.

(18) Bolted connections of load sustaining members or components of the platform must be in accordance with the AISC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

(19) You must provide a weatherproof compartment suitable for storage of the operator's manual and assorted other documents, or a weatherproof placard displaying the operator's manual, and readable

from the platform, when motion controls that are operational from the platform are installed.

(20) Motion controls, if installed on the platform, must:

(a) Be clearly identified as to their function;

(b) Be protected from inadvertent actuation;

(c) Be inside the platform and readily accessible to the operator;

(d) When possible be oriented and move in the approximate direction of the function that they control;

(e) Return to their neutral position and stop all motion when released.

(21) Boom motion controls, if provided, must additionally:

(a) Include a control that must be continuously activated for controls to be operational;

(b) Include an emergency stop control that does not require continuous actuation for a stop condition;

(c) Have motion controls, accessible at ground level, that can override platform controls.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-55300 Personnel lifting requirements. (1) Conditions must provide clear visibility. When conditions such as darkness, fog, or snow prevent clear visibility, you must not perform a personnel lift.

(2) Personnel platforms cannot be used in winds (sustained or gusts) in excess of 20 mph (32.2 km/hr) or in electric storms, snow, ice, sleet, or other adverse weather conditions which could affect the safety of personnel.

(3) Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, you must not begin the lifting operation (or, if already in progress, you must terminate operations).

(4) You must only use personnel platforms for personnel, their tools, and sufficient material to do their work. You must not use them solely for transporting bulk materials.

(5) The number of employees occupying the personnel platform must not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.

(6) A qualified person must evaluate the safety concerns of the operational environment and verify the platform and crane/derrick are suitable for use. Additionally, special work circumstances may require further precautions. You must take precautions such as, but not limited to, the following:

(a) When welding is to be accomplished from the personnel platform, you must provide suitable electrode holders to protect them from contact with any conducting components of the platform.

(b) You must instruct operators of cranes/derricks, installed on floating vessels, not to lift personnel when the list or trim of the vessel exceeds 5 degrees. If a mobile crane/derrick is placed on floating vessels, operators must not lift personnel when the list or trim of the vessel exceeds one degree.

(c) You must provide personnel fall protection devices with quick release features and require them to be worn. The fall protection device must be appropriately attached while personnel are lifted over land and detached while personnel are lifted over water. See (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection for requirements for fall arrest system, including the attachment point (anchorage) used to comply with this subsection. When personnel lifts are conducted over water, you must provide U.S. Coast Guard approved (Type I, II, III, or V) personnel flotation devices and require them to be worn.

(d) A boat/skiff with appropriate rescue personnel must be readily available at all times during a personnel lift over water.

(e) You must provide appropriate personnel protective equipment and require it to be used around toxic, flammable, or hazardous substances or fumes.

(f) You must review any concentrated loading of the platform to preclude the overstressing of any component or impairing the platform stability.

(g) Where the rotation of the platform, while hoisted, can create a hazard, you must provide appropriate restraining methods and require them to be used.

(7) In order to safely perform the personnel lift, make sure the following are met:

(a) The personnel platform is **not** loaded with more than its rated load capacity;

(b) Materials and tools being lifted by a platform are:

(i) Secured to prevent movement;

(ii) Evenly distributed on the platform.

(c) The personnel platform is hoisted slowly, with no sudden movements;

(d) Tag lines are used to control the motion of suspended platforms, unless using them creates a hazard;

(e) The platform is secured to the structure where the work will be performed before employees exit or enter the platform, unless securing to the structure is unsafe;

(f) No other load lines on the crane or derrick are used to lift anything while personnel are on a platform;

(g) Brakes and locking devices are engaged when the personnel platform is occupied and in a stationary working position;

(h) The lowering motion of the hoist line and/or the boom is power-controlled only. Free fall is **not** allowed;

(8) The platform operation instructions in this rule are intended as minimum criteria. You must consult the platform manufacturer's information for specific instruction on the platform's operation.

(9) Traveling.

(a) Rubber tired cranes are not allowed to travel while lifting personnel. Hoisting of employees while the crane is traveling is only allowed when:

(i) The crane travels on fixed rails; or

(ii) The crane has crawlers and is on a runway, and the employer demonstrates that there is no less hazardous way to perform the work.

(b) Where employees are hoisted while the crane is traveling, you must meet the following criteria:

(i) You must restrict crane travel to a fixed track or runway.

(ii) Where a runway is used, it must be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane/derrick being used to lift and travel with

the personnel platform. An existing surface may be used as long as it meets these criteria.

(iii) You must limit travel to boom length.

(iv) The boom must be parallel to the direction of travel, except where it is safer to do otherwise.

(v) You must perform a complete trial run to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by WAC 296-155-55115 which tests the lift route.

(10) Derricks are prohibited from traveling while personnel are hoisted.

(11) Platform occupants must remain in continuous sight or in communication with the operator and in sight and communication of a signal person.

(12) Platform occupants must use personnel protective equipment, such as hard hats, safety glasses, hearing protection, and gloves, in conditions where a hazard of injury exists.

(13) Platform occupants must wear personnel fall protection devices with lanyards attached to a specific anchorage point(s), unless special work circumstance requirements dictate otherwise, such as working over water.

(14) Platform occupants must keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person.

(15) Platform occupants must not stand, sit on, or work from the top rail, intermediate rail, toe board, or use any other device to enhance their vertical height working capability.

(16) Platform occupants must not pull the platform out of plumb in relation to the crane/derrick.

(17) Platform occupants must not enter or exit a suspended platform while it is raised unless the platform has an installed gate and is physically secured to the structure to which the occupants are entering or exiting unless the employer can demonstrate that securing to the structure would create a greater hazard.

(18) Platform occupants must not operate a platform with motion controls without the platform operation manual available in the platform.

(19) If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation that it is freely suspended.

(20) You must inspect the platform prior to each lift to verify all attachments and the platform are safe to use.

(21) Verify the platform is evenly loaded, material secured, and the total platform weight does not exceed the platform rating or the reduced crane/derrick lift capacity.

(22) Communication requirements.

(a) Hand signals to the operator must be in accordance with the applicable crane/derrick portion of this part.

(b) Signals must be discernable or audible to the operator.

(c) You must post hand signals conspicuously at the following locations:

(i) On the crane/derrick as required by this part.

(ii) Inside the personnel platform.

(iii) At any platform motion control locations.

(d) Some operations may require additions to or modifications of standard signals.

(i) Any special signals must be agreed upon and understood by the signal persons and crane/derrick operator.

(ii) Special signs must not conflict with the crane/derrick standard signals.

(e) No response must be made unless signals are clearly understood.

(f) If communications between operator and platform occupants are disrupted, you must stop all operations until communication is reestablished.

(g) You must verify communication systems to be used during the lift as functioning and effective prior to commencing the lift.

Note: If radios or other electronic means of communication are used, they should operate on a secure channel.

WAC 296-155-655 General protection requirements. (1) **Surface encumbrances.** You must remove or support surface encumbrances that are located so as to create a hazard to employees, as necessary, to safeguard employees.

(2) **Underground installations.**

(a) You must locate utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, prior to opening an excavation.

(b) You must contact utility companies or owners within established or customary local response times, advised of the proposed work, and asked to locate the underground utility installation prior to the start of actual excavation.

(c) When excavation operations approach the location of underground installations, you must determine the exact location of the installations by safe and acceptable means.

(d) While the excavation is open, you must protect underground installations, supported, or removed as necessary to safeguard employees.

(3) **Access and egress.**

(a) Structural ramps.

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

(ii) Ramps and runways constructed of two or more structural members must have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways must be of uniform thickness.

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

(v) Structural ramps used in lieu of steps must be provided with cleats or other surface treatments on the top surface to prevent slipping.

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

(4) **Exposure to vehicular traffic.** You must provide employees exposed to vehicular traffic with, and they must wear, high-visibility garments meeting the requirements of WAC 296-155-200, General requirements for personal protective equipment (PPE).

(5) **Exposure to falling loads.** You must not permit any employee underneath loads handled by lifting or digging equipment. You must require employees to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with WAC 296-155-610 (2)(g), to provide adequate protection for the operator during loading and unloading operations.

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

(7) **Hazardous atmospheres.**

(a) Testing and controls. In addition to the requirements set forth in parts B-1, C, and C-1 of this chapter (296-155 WAC) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements apply:

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

(ii) You must take adequate precautions to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with chapter 296-842 WAC.

(iii) You must take adequate precaution such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 10 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, you must conduct testing as often as necessary to ensure that the atmosphere remains safe.

(b) Emergency rescue equipment.

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

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

Note: See chapter 296-62 WAC, Part M for additional requirements applicable to confined space operations.

(8) **Protection from hazards associated with water accumulation.**

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

(b) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and opera-

tions must be monitored by a competent person to ensure proper operation.

(c) If excavation work interrupts the natural drainage of surface water (such as streams), you must use diversion ditches, dikes, or other suitable means to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with subdivisions (a) and (b) of this subsection.

(9) Stability of adjacent structures.

(a) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, you must provide support systems such as shoring, bracing, or underpinning to ensure the stability of such structures for the protection of employees.

(b) You must not permit excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees except when:

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

(ii) The excavation is in stable rock; or

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

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

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

(10) Protection of employees from loose rock or soil.

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

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

(11) Inspections.

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

(b) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions,

you must remove exposed employees from the hazardous area until the necessary precautions have been taken to ensure their safety.

(12) **Fall protection.**

(a) You must provide walkways where employees or equipment are required or permitted to cross over excavations. You must provide guardrails which comply with chapter ((~~296-155 WAC, Part C-1~~) 296-880 WAC, Unified safety standards for fall protection where walkways are 4 feet or more above lower levels.

(b) You must provide adequate barrier physical protection at all remotely located excavations. You must barricade or cover all wells, pits, shafts, etc. Upon completion of exploration and similar operations, you must backfill temporary wells, pits, shafts, etc.

WAC 296-155-706 Structural steel assembly. (1) You must maintain structural stability at all times during the erection process.

Note: Federal Highway Administration (FHWA) regulations incorporate by reference a number of standards, policies, and standard specifications published by the American Association of State Highway and Transportation Officials (AASHTO) and other organizations. (See 23 C.F.R. 625.4.) Many of these incorporated provisions may be relevant to maintaining structural stability during the erection process. For instance, as of May 17, 2010, in many cases FHWA requires a registered engineer to prepare and seal working drawings for falsework used in highway bridge construction. (See *AASHTO Specifications for Highway Bridges, Div. II, Sec. 3.2.1, 15th edition, 1992*, which FHWA incorporates by reference in 23 C.F.R. 625.4.) FHWA also encourages compliance with AASHTO Specifications that the FHWA regulations do not currently incorporate by reference. (See <http://www.fhwa.dot.gov/bridge/lrfd/index.htm>.)

- Make sure that multistory structures have the following:
 - Permanent floors installed as the erection of structural members progress;
 - No more than 8 stories between the erection floor and the upper-most permanent floor; and
 - No more than 4 floors or 48 feet (14.6 m), whichever is less, of unfinished bolting or welding above the foundation or uppermost permanent secured floor.

Exception: The above applies except where the structural integrity is maintained as a result of design.

(2) **Walking/working surfaces.**

(a) Shear connectors and other similar devices.

(i) Shear connectors, reinforcing bars, deformed anchors or threaded studs must not be attached to the top flanges of beams, joists or beam attachments so they project vertically from or horizontally across the top flange of the member until after the metal decking, or other walking/working surface has been installed. This becomes a tripping hazard. Examples of shear connectors are headed steel studs, steel bars or steel lugs.

(ii) Installation of shear connectors on composite floors. When shear connectors are used in construction of composite floors, roofs and bridge decks, employees must lay out and install the shear connectors after the metal decking has been installed, using the metal decking as a working platform.

(b) Slip resistance of metal decking.

(c) You must provide safe access to the working level. Employees must not slide down ropes, columns, or ladders.

(3) **Plumbing-up.**

(a) When deemed necessary by a competent person, you must install plumbing-up equipment in conjunction with the steel erection process to ensure the stability of the structure.

(b) When used, plumbing-up equipment must be in place and properly installed before the structure is loaded with construction material such as loads of joists, bundles of decking or bundles of bridging.

(c) You must only remove plumbing-up equipment with the approval of a competent person.

(4) **Metal decking.**

(a) Hoisting, landing and placing of metal decking bundles.

(i) You must not use bundle packaging and strapping for hoisting unless specifically designed for that purpose.

(ii) If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, you must secure such items to the bundles.

(iii) You must land bundles of metal decking on joists in accordance with WAC 296-155-709 (5) (d).

(iv) You must land metal decking bundles on framing members so that enough support is provided to allow the bundles to be unbanded without dislodging the bundles from the supports.

(v) At the end of the shift or when environmental or job site conditions require, you must secure metal decking against displacement.

(b) Roof and floor holes and openings. You must install metal decking at roof and floor holes and openings as follows:

(i) Framed metal deck openings must have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructibility.

(ii) Roof and floor holes and openings must be decked over. Where large size, configuration or other structural design does not allow openings to be decked over (such as elevator shafts, stair wells, etc.) you must protect employees in accordance with chapter ((296-155 WAC, Part C-1, Fall protection requirements for construction)) 296-880 WAC, Unified safety standards for fall protection.

(iii) You must not cut metal decking holes and openings until immediately prior to them being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements of (c) of this subsection, or they must be immediately covered.

(c) **Covering roof and floor openings.** Smoke dome or skylight fixtures that have been installed are not considered covers for the purpose of this section unless they meet the strength requirements of chapter ((296-155 WAC, Part C-1, Fall protection requirements for construction)) 296-880 WAC, Unified safety standards for fall protection.

(d) **Decking gaps around columns.** You must install wire mesh, exterior plywood, or equivalent, around columns where planks or metal decking do not fit tightly. The materials used must be of sufficient strength to provide fall protection for personnel and prevent objects from falling through.

(e) **Installation of metal decking.**

(i) You must lay metal decking tightly and immediately secure it upon placement to prevent accidental movement or displacement.

(ii) During initial placement, you must place metal decking panels to ensure full support by structural members.

(f) **Derrick floors.**

(i) You must fully deck and plank a derrick floor and complete the steel member connections to support the intended floor loading.

(ii) Temporary loads placed on a derrick floor must be distributed over the underlying support members so as to prevent local overloading of the deck material.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-716 Fall protection. (1) General requirements.

(a) Fall protection will be in accordance with chapter ((296-155 WAC, Part C-1, Fall protection requirements for construction)) 296-880 WAC, Unified safety standards for fall protection.

(b) During steel erection activities, fall protection must be as required by chapter ((296-155 WAC, Part C-1)) 296-880 WAC, Unified safety standards for fall protection. Additionally, on multistory

structures, you must install perimeter safety cables at the final interior and exterior perimeters of the floors as soon as metal decking has been installed. See Appendix D.

(2) **Connectors.** Each connector must: Have completed connector training in accordance with WAC 296-155-717.

(3) **Custody of fall protection.** Fall protection provided by the steel erector must remain in the area where steel erection activity has been completed, to be used by other trades, only if the controlling contractor or its authorized representative:

(a) Has directed the steel erector to leave the fall protection in place; and

(b) Has inspected and accepted control and responsibility of the fall protection prior to authorizing persons other than steel erectors to work in the area.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-717 Training. (1) **Training personnel.** Training required by this section must be provided by a qualified person(s).

(2) **Fall hazard training.** You must train each employee exposed to a fall hazard in accordance with the requirements of this chapter. You must institute a training program as required by chapter ((296-155 WAC, Part C-1, and ensure employee participation in the program)) 296-880 WAC, Unified safety standards for fall protection.

(3) **Special training programs.** In addition to the training required in subsection (2) of this section, you must provide special training to employees engaged in the following activities:

(a) Multiple lift rigging procedure. You must ensure that each employee who performs multiple lift rigging has been provided training in the following areas:

(i) The nature of the hazards associated with multiple lifts; and

(ii) The proper procedures and equipment to perform multiple lifts required by WAC 296-155-704(5).

(b) Connector procedures. You must ensure that each connector has been provided training in the following areas:

(i) The nature of the hazards associated with connecting (see Appendix D for nonmandatory training guidelines); and

(ii) The establishment, access, proper connecting techniques, double connections, and work practices, required by WAC 296-155-708(3) and ((Part C-1, chapter 296-155 WAC)) chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-730 Tunnels and shafts. (1) **Scope and application.**

(a) This section applies to the construction of underground tunnels, shafts, chambers, and passageways. This section also applies to cut-and-cover excavations which are both physically connected to ongoing underground construction operations within the scope of this sec-

tion, and covered in such a manner as to create conditions characteristic of underground construction.

(b) This section does not apply to excavation and trenching operations covered by Part N of this chapter, such as foundation operations for above-ground structures that are not physically connected to underground construction operations, and surface excavation.

(c) You must comply with the requirements of this part and chapter in addition to applicable requirements of chapter 296-36 WAC, Safety standards—Compressed air work.

(2) **Access and egress.**

(a) Each operation must have a check-in/check-out system that will provide positive identification of every employee underground. You must keep an accurate record of identification and location of the employees on the surface. This procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent environmental controls are effective, and when the remaining construction activity will not cause any environmental hazard, or structural failure within the facilities.

(b) You must provide and maintain safe means of access and egress to all work stations.

(c) You must provide access and egress in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.

(d) You must control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings must be tightly covered, bulkheaded, or fenced off, and must be posted with warning signs indicating "keep out" or similar language. Completed or unused sections of the underground facility must be barricaded.

(3) **Safety instruction.** You must instruct all employees in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

- (a) Air monitoring;
- (b) Ventilation;
- (c) Confined space entry procedures;
- (d) Permit-required confined space entry procedures;
- (e) Illumination;
- (f) Communications;
- (g) Flood control;
- (h) Mechanical equipment;
- (i) Personal protective equipment;
- (j) Explosives;
- (k) Fire prevention and protection; and
- (l) Emergency procedures, including evacuation plans and check-in/check-out systems.

(4) **Notification.**

(a) You must inform oncoming shifts of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fire(s), or explosions.

(b) You must record information specified in (a) of this subsection in a shift journal which must be current prior to the end of each shift, and must be located aboveground.

(c) Oncoming supervisory personnel must read the notification prior to going underground, and must signify their understanding of the contents by affixing their respective initials to the log.

(d) You must retain the hazard notification log on the site until the completion of the project.

(e) You must establish and maintain direct communications for coordination of activities with other employers whose operations at the job site affect or may affect the safety of employees underground.

(5) **Communications.**

(a) When natural unassisted voice communication is ineffective, you must use a power-assisted means of voice communication to provide communication between the work face, the bottom of the shaft, and the surface.

(b) You must provide two effective means of communication, at least one of which must be voice communication, in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator communication are contained in subsection (22)(c)(xv) of this section.

(c) Powered communication systems must operate on an independent power supply, and must be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the system from any other location.

(d) You must test communication systems upon initial entry of each shift to the underground, and as often as necessary at later times, to ensure that they are in working order.

(e) You must provide any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted voice communication and not under observation by other persons, with an effective means of obtaining assistance in an emergency.

(6) **Emergency provisions.** Hoisting capability. When a shaft is used as a means of egress, you must make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the job site. Such hoisting means must be designed so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

(7) **Self-rescuers.** You must provide self-rescuers certified by the National Institute for Occupational Safety and Health under 42 C.F.R. Part 84. The respirators must be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of respirators must be in accordance with the requirements of chapter 296-842 WAC.

(8) **Designated person.** At least one designated person must be on duty aboveground whenever any employee is working underground. This designated person must be responsible for securing immediate aid and keeping an accurate record of the number, identification, and location of employees who are underground in case of emergency. The designated person must not be so busy with other responsibilities that the personnel counting and identification function is encumbered.

(9) **Emergency lighting.** Each employee underground must have an acceptable portable hand lamp or cap lamp in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.

(10) **Rescue teams.**

(a) On job sites where 25 or more employees work underground at one time, you must provide (or make arrangements in advance with locally available rescue services to provide) at least two 5-person rescue teams, one on the job site or within 1/2 hour travel time from the entry point, and the other within 2 hours travel time.

(b) On job sites where less than 25 employees work underground at one time, you must provide (or make arrangements in advance with locally available rescue services to provide) at least one 5-person rescue team to be either on the job site or within 1/2 hour travel time from the entry point.

(c) Rescue team members must be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of fire-fighting equipment. You must review qualification not less than annually.

(d) On job sites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members must practice donning and using pressure demand mode, self-contained breathing apparatuses monthly.

(e) You must ensure that rescue teams are familiar with conditions at the job site.

(11) **Hazardous classifications.**

(a) Potentially gassy operations. Underground construction operations must be classified as potentially gassy if either:

(i) Air monitoring discloses 10% or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10% or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

(b) Gassy operations. Underground construction operations must be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) +/- 0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for 3 consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(c) Declassification to potentially gassy operations. Underground construction gassy operations may be declassified to potentially gassy when air monitoring results remain under 10% of the lower explosive limit for methane or other flammable gases for 3 consecutive days.

(12) **Gassy operations—Additional requirements.** You must only use acceptable equipment, maintained in suitable condition, in gassy operations.

(a) Mobile diesel-powered equipment used in gassy operations must be either approved in accordance with the requirements of 30 C.F.R. Part 36 (formerly Schedule 31) by MSHA, or you must demonstrate it to be fully equivalent to such MSHA-approved equipment, and it must be operated in accordance with that part.

(b) You must prominently post each entrance to a gassy operation with signs notifying all entrants of the gassy classification.

(c) Smoking must be prohibited in all gassy operations and you must be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering a gassy operation.

(d) You must maintain a fire watch as described in chapter 296-155 WAC, Part H, when hot work is performed.

(e) Once an operation has met the criteria in subsection (11)(a)(i) of this section, warranting classification as gassy, you must discontinue all operations in the affected area, except the following, until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with (c) of this subsection:

(i) Operations related to the control of the gas concentration;

(ii) Installation of new equipment, or conversion of existing equipment, to comply with this subsection; and

(iii) Installation of above-ground controls for reversing the air flow.

(13) Air quality and monitoring.

(a) General. Air quality limits and control requirements specified in chapter 296-841 WAC apply except as modified by this subsection.

(b) You must assign a competent person who must perform all air monitoring required by this section.

(c) Where this section requires monitoring of airborne contaminants "as often as necessary," the competent person must make a reasonable determination as to which substances to monitor and how frequently to monitor, considering at least the following factors:

(i) Location of job site: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;

(ii) Geology: Geological studies of the job site, particularly involving the soil type and its permeability;

(iii) History: Presence of air contaminants in nearby job sites, changes in levels of substances monitored on the prior shift; and

(iv) Work practices and job site conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decompression of the atmosphere, welding, cutting and hot work, and employees' physical reactions to working underground.

(d) You must provide testing and monitoring instruments which are capable of achieving compliance with the provisions of this subsection, and:

(i) Must maintain the testing and monitoring instruments in good condition;

(ii) Must calibrate the instruments on a frequency not to exceed 6 months.

(e) Exposure to airborne contaminants must not exceed the levels established by chapter 296-841 WAC.

(f) You must not substitute respirators for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of time in concentrations of airborne contaminants which exceed the limit of permissible exposure referred to in (d) of this subsection, if the employee wears a respiratory protective device certified by MSHA-NIOSH for protection against the particular hazards in-

involved, and the selection and use of respirators complies with the provisions of chapter 296-842 WAC.

(g) You must withdraw employees from areas in which there is a concentration of an airborne contaminant which exceeds the permissible exposure limit listed for that contaminant, except as modified in (t) (i) and (ii) of this subsection.

(h) You must test the atmosphere in all underground work areas as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5% oxygen and no more than 22% oxygen.

(i) You must perform tests for oxygen content before tests for air contaminants.

(j) You must use field-type oxygen analyzers, or other suitable devices, to test for oxygen deficiency.

(k) You must test the atmosphere in all underground work areas quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dust, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in chapter 296-62 WAC, Part H, are not exceeded.

(l) You must test the atmosphere in all underground work areas quantitatively for methane and other flammable gases as often as necessary to determine:

(i) Whether action is to be taken under (q), (r), and (s) of this subsection; and

(ii) Whether an operation is to be classified potentially gassy or gassy under subsection (11) of this section.

(m) If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, you must make an initial test of the inlet air of the fan or compressor, with the engines operating, to ensure that the air supply is not contaminated by engine exhaust.

(n) You must perform testing as often as necessary to ensure that the ventilation requirements of subsection (15) of this section are met.

(o) When rapid excavation machines are used, you must operate a continuous flammable gas monitor at the face with the sensor(s) placed as high and close to the front of the machine's cutter head as practicable.

(p) Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, you must conduct a test in the affected underground work area(s), at least at the beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

(i) Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, you must use a continuous sampling and indicating hydrogen sulfide monitor to monitor the affected work area.

(ii) You must inform employees when a concentration of 10 ppm hydrogen sulfide is exceeded.

(iii) The continuous sampling and indicating hydrogen sulfide monitor must be designed, installed, and maintained to provide a visual and aural alarm when the hydrogen sulfide concentration reaches 15 ppm to signal that additional measures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

(q) When the competent person determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, you must:

(i) Prominently post a notice at all entrances to the underground job site to inform all entrants of the hazardous condition; and

(ii) Immediately increase sampling frequency levels to insure workers are not exposed to identified contaminants in excess of the permissible exposure limit(s); and

(iii) Ensure that all necessary precautions are taken to comply with pertinent requirements of this section, and chapter 296-62 WAC.

(r) Whenever 5% or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, you must take steps to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below 5% of the lower explosive limit, but must be reinstated whenever the 5% level is exceeded.

(s) Whenever 10% or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, you must suspend such work until the concentration of such flammable gas is reduced to less than 10% of the lower explosive limit.

(t) Whenever 20% or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return:

(i) You must immediately withdraw all employees, except those necessary to eliminate the hazard, to a safe location above ground; and

(ii) Employees who remain underground to correct or eliminate the hazard described in (t) above must be equipped with approved, pressure demand mode, self-contained breathing apparatus, and must have received adequate training in the proper use of that equipment.

(iii) You must cut off electrical power, except for acceptable pumping and ventilation equipment, to the area endangered by the flammable gas until the concentration of such gas is reduced to less than 20% of the lower explosive limit.

(14) Additional monitoring for potentially gassy and gassy operations. Operations which meet the criteria for potentially gassy and gassy operations set forth in subsection (13) of this section must be subject to the additional monitoring requirements of this subsection.

(a) You must conduct a test for oxygen content in the affected underground work areas and work areas immediately adjacent to such areas at least at the beginning and midpoint of each shift.

(b) When using rapid excavation machines, you must use continuous automatic flammable gas monitoring equipment to monitor the air at the heading, on the rib, and in the return air duct. The continuous monitor must signal the heading, and shut down electric power in the affected underground work area, except for acceptable pumping and ventilation equipment, when 20% or more of the lower explosive limit for methane or other flammable gases is encountered.

(i) You must use a manual flammable gas monitor as needed, but at least at the beginning and midpoint of each shift, to ensure that the limits prescribed in subsections (11) and (13) of this section are not exceeded. In addition, you must provide a manual electrical shut down control (~~must be provided~~) near the heading.

(ii) You must make local gas tests prior to and continuously during any welding, cutting, or other hot work.

(iii) In underground operations driven by drill-and-blast methods, you must test the air in the affected area for flammable gas pri-

or to re-entry after blasting, and continuously when employees are working underground.

(c) Recordkeeping. You must maintain a record of all air quality tests above ground at the worksite and be made available to the director or his/her representatives upon request. The record must include the location, date, time, substance and amount monitored. You must retain records of exposures to toxic substances in accordance with Part B, chapter 296-62 WAC. You must retain all other air quality test records until completion of the project.

(15) Ventilation.

(a)(i) You must supply fresh air to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

(ii) You must provide mechanical ventilation in all underground work areas except when the employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

(b) You must supply a minimum of 200 cubic feet (5.7 m³) of fresh air per minute for each employee underground.

(c) The linear velocity of air flow in the tunnel bore, in shafts, and in all other underground work areas must be at least 30 feet (9.15 m) per minute where blasting or rock drilling is conducted, or where other conditions likely to produce dust, fumes, mists, vapors, or gases in harmful or explosive quantities are present.

(d) The direction of mechanical air flow must be reversible.

(e) You must not use air that has passed through underground oil or fuel-storage areas to ventilate working areas.

(f) Following blasting, ventilation systems must exhaust smoke and fumes to the outside atmosphere before work is resumed in affected areas.

(g) Ventilation doors must be designed and installed so that they remain closed when in use, regardless of the direction of the air flow.

(h) When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person must test all affected areas after ventilation has been restored and must determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

(i) Whenever the ventilation system has been shut down with all employees out of the underground area, you must only allow competent persons authorized to test for air contaminants underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

(j) When drilling rock or concrete, you must take appropriate dust control measures to maintain dust levels within limits set in chapter 296-155 WAC, Part B-1. Such measures may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

(k)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations must be either approved by MSHA in accordance with the provisions of 30 C.F.R. Part 32 (formerly Schedule 24), or you must prove it to be fully equivalent to such MSHA-approved equipment, and it must be operated in accordance with that Part. (Each

brake horsepower of a diesel engine requires at least 100 cubic feet (28.32 m³) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

(iii) You must submit an application to the mining/explosives section, department of labor and industries, for permission to use specified diesel equipment in a specified underground area and it must include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, you must obtain written permission from the department of labor and industries or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases do not exceed the maximum percentage of carbon monoxide permitted, is required.

(D) You must only use diesel equipment underground where the ventilation is controlled by mechanical means and must not be operated if the ventilating current is less than 100 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) You must take air measurements at least once daily in the diesel engine working area and the measurements entered in the Underground Diesel Engine Record Book. Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm ³
Next to equipment	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Carbon Monoxide	.0035%	35 ppm
General atmosphere	Nitrogen Dioxide	.0001%	1 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

³Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(l) Potentially gassy or gassy operations must have ventilation systems installed which must:

(i) Be constructed of fire-resistant materials; and

(ii) Have acceptable electrical systems, including fan motors.

(m) You must provide gassy operations with controls located aboveground for reversing the air flow of ventilation systems.

(n) In potentially gassy or gassy operations, wherever mine-type ventilation systems using an offset main fan installed on the surface are used, they must be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway.

(16) **Illumination.**

(a) You must provide sufficient lighting in accordance with the requirements of chapter 296-155 WAC, Part B-1, to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(b) You must only use acceptable portable lighting within 50 feet (15.24 m) of any underground heading during explosive handling.

(17) Fire prevention and control. Fire prevention and protection requirements applicable to underground construction operations are found in Part D of this chapter except as modified by the following additional standards.

(a) Open flames and fires are prohibited in all underground construction operations except as permitted for welding, cutting, and other hot work operations.

(i) Smoking may be allowed only in areas free of fire and explosion hazards.

(ii) You must post readily visible signs prohibiting smoking and open flames in areas having fire or explosion hazards.

(iii) You must prohibit the carrying of matches, lighters, or other flame-producing smoking materials in all underground operations where fire or explosion hazards exist.

(b) You may store underground no more than a 24-hour supply of diesel fuel for the underground equipment used at the worksite.

(c) The piping of diesel fuel from the surface to an underground location is permitted only if:

(i) Diesel fuel is contained at the surface in a tank whose maximum capacity is no more than the amount of fuel required to supply for a 24-hour period the equipment serviced by the underground fueling station; and

(ii) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is controlled at the surface by a valve, and at the shaft bottom by a hose nozzle; and

(iii) The pipe is empty at all times except when transferring diesel fuel from the surface tank to a piece of equipment in use underground; and

(iv) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(d) (i) You must not carry, store, or use gasoline underground.

(ii) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with Part H of this chapter and subsections (13), (15), (17), and (18) of this section.

(e) You must keep oil, grease, and diesel fuel stored underground in tightly sealed containers in fire-resistant areas at least 300 feet (91.44 m) from underground explosive magazines, and at least 100 feet (30.48 m) from shaft stations and steeply inclined passageways. Storage areas must be positioned or diked so that the contents of ruptured or overturned containers will not flow from the storage area.

(f) You must not store flammable or combustible materials above ground within 100 feet (30.48 m) of any access opening to any underground operation. Where this is not feasible because of space limitations at the job site, such materials may be located within the 100-foot limit, provided that:

(i) They are located as far as practicable from the opening; and

(ii) Either a fire-resistant barrier of not less than one-hour rating is placed between the stored material and the opening, or additional precautions are taken which will protect the materials from ignition sources.

(g) You must use fire-resistant hydraulic fluids in hydraulically actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher(s) rated at a sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:40B:C.

(h) (i) You must only use electrical installations in underground areas where oil, grease, or diesel fuel are stored for lighting fixtures.

(ii) Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, must be approved for Class I, Division 2 locations, in accordance with Part I of this chapter.

(i) You must clean up leaks and spills of flammable or combustible fluids immediately.

(j) You must provide a fire extinguisher of at least 4A:40B:C rating or other equivalent extinguishing means at the head pulley and at the tail pulley of underground belt conveyors, and at 300-foot intervals along the belt.

(k) Any structure located underground or within 100 feet (30.48 m) of an opening to the underground must be constructed of material having a fire-resistance rating of at least one hour.

(18) **Welding, cutting, and other hot work.** In addition to the requirements of Part H of this chapter, the following requirements apply to underground welding, cutting, and other hot work.

(a) You must not permit more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot work during the next 24-hour period underground.

(b) You must install noncombustible barriers below welding, cutting, or other hot work being done in or over a shaft or raise.

(19) **Ground support.**

(a) In tunnels (other than hard rock) you must use timber sets, steel rings, steel frames, concrete liners, or other engineered tunnel support systems. Every tunnel support system must be designed by a licensed professional engineer. Design specifications must be available at the worksite.

(b) Portal areas. You must guard portal openings and access areas by shoring, fencing, head walls, shotcreting, or other equivalent protection to ensure safe access of employees and equipment. Adjacent areas must be scaled or otherwise secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.

(c) Subsidence areas. You must ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and posting warning signs to prevent entry.

(d) Underground areas.

(i) (A) A competent person must inspect the roof, face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability.

(B) You must protect competent persons conducting such inspections from loose ground by location, ground support, or equivalent means.

(ii) You must inspect ground conditions along haulageways and travelways as frequently as necessary to ensure safe passage.

(iii) You must take down, scale, or support loose ground that might be hazardous to employees.

(iv) You must use torque wrenches wherever bolts that depend on torsionally applied force are used for ground support.

(v) A competent person must determine whether rock bolts meet the necessary torque, and must determine the testing frequency in light of the bolt system, ground conditions, and the distance from vibration sources.

(vi) You must provide suitable protection for employees exposed to the hazard of loose ground while installing ground support systems.

(vii) You must install support sets so that the bottoms have sufficient anchorage to prevent ground pressures from dislodging the support base of the sets. You must provide lateral bracing (collar brac-

ing, tie rods, or spreaders) between immediately adjacent sets to ensure added stability.

(viii) You must promptly repair or replace damaged or dislodged ground supports that create a hazardous condition. When replacing supports, you must install the new supports before the damaged supports are removed.

(ix) You must use a shield or other type of support to maintain a safe travelway for employees working in dead-end areas ahead of any support replacement operation.

(e) Shafts.

(i) Shafts and wells over 4 feet (1.219 m) in depth that employees must enter must be supported by a steel casing, concrete pipe, timber, solid rock, or other suitable material.

(ii)(A) The full depth of the shaft must be supported by casing or bracing except where the shaft penetrates into solid rock having characteristics that will not change as a result of exposure. Where the shaft passes through earth into solid rock, or through solid rock into earth, and where there is potential for shear, the casing or bracing must extend at least 5 feet (1.53 m) into the solid rock. When the shaft terminates in solid rock, the casing or bracing must extend to the end of the shaft or 5 feet (1.53 m) into the solid rock, whichever is less.

(B) The casing or bracing must extend 42 inches (1.07 m) plus or minus 3 inches (8 cm) above ground level, except that the minimum casing height may be reduced to 12 inches (0.3 m), provided that a standard railing is installed; that the ground adjacent to the top of the shaft is sloped away from the shaft collar to prevent entry of liquids; and that effective barriers are used to prevent mobile equipment operating near the shaft from jumping over the 12-inch (0.3 m) barrier.

(iii) After blasting operations in shafts, a competent person must determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, you must make necessary repairs before employees other than those assigned to make the repairs are allowed in or below the affected areas.

(f) Blasting. This subsection applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in chapter 296-52 WAC.

(i) You must keep blasting wires clear of electrical lines, pipes, rails, and other conductive material, excluding earth, to prevent explosives initiation or employee exposure to electric current.

(ii) Following blasting, an employee must not enter a work area until the air quality meets the requirements of subsection (13) of this section.

(g) Drilling.

(i) A competent person must inspect all drilling and associated equipment prior to each use. You must correct equipment defects affecting safety before the equipment is used.

(ii) You must inspect the drilling area for hazards before the drilling operation is started.

(iii) You must not allow employees on a drill mast while the drill bit is in operation or the drill machine is being moved.

(iv) When a drill machine is being moved from one drilling area to another, you must secure drill steel, tools, and other equipment and the mast must be placed in a safe position.

(v) You must provide receptacles or racks for storing drill steel located on jumbos.

(vi) You must warn employees working below jumbo decks whenever drilling is about to begin.

(vii) You must anchor drills on columns firmly before starting drilling, and you must retighten them as necessary thereafter.

(viii) You must provide mechanical means on the top deck of a jumbo for lifting unwieldy or heavy material.

(ix) When jumbo decks are over 10 feet (3.05 m) in height, ((the)) you must install stairs wide enough for two persons.

(x) Jumbo decks more than 10 feet (3.05 m) in height must be equipped with guardrails on all open sides, excluding access openings of platforms, unless an adjacent surface provides equivalent fall protection.

(xi) You must only allow employees assisting the operator to ride on jumbos, unless the jumbo meets the requirements of subsection (20)(e) of this section.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(xii) Jumbos must be chocked to prevent movement while employees are working on them.

(xiii) You must maintain walking and working surfaces of jumbos to prevent the hazards of slipping, tripping, and falling.

(xiv) Jumbo decks and stair treads must be designed to be slip-resistant and secured to prevent accidental displacement.

(xv) Scaling bars must be available at scaling operations and you must maintain them in good condition at all times. You must not use blunted or severely worn bars.

(xvi) Before commencing the drill cycle, you must examine the face and lifters for misfires (residual explosives) and, if found, you must remove them before drilling commences at the face. You must not drill blasting holes through blasted rock (muck) or water.

(xvii) You must protect employees in a shaft either by location or by suitable barrier(s) if powered mechanical loading equipment is used to remove muck containing unfired explosives.

(xviii) You must post a caution sign reading "buried line," or similar wording where air lines are buried or otherwise hidden by water or debris.

(20) **Haulage.**

(a) A competent person must inspect haulage equipment before each shift.

(i) You must correct equipment defects affecting safety and health before the equipment is used.

(ii) Powered mobile haulage equipment must be provided with adequate brakes.

(iii) Power mobile haulage equipment, including trains, must have audible warning devices to warn employees to stay clear. The operator must sound the warning device before moving the equipment and whenever necessary during travel.

(iv) The operator must ensure that lights which are visible to employees at both ends of any mobile equipment, including a train, are turned on whenever the equipment is operating.

(v) In those cabs where glazing is used, the glass must be safety glass, or its equivalent, and you must maintain and clean it so that vision is not obstructed.

(b) You must install antirollback devices or brakes on inclined conveyor drive units to prevent conveyors from inadvertently running in reverse. You must not permit employees to ride a power-driven

chain, belt, or bucket conveyor unless the conveyor is specifically designed for the transportation of persons.

(c) Endless belt-type manlifts are prohibited in underground construction.

(d) General requirements also applicable to underground construction for use of conveyors in construction are found in chapter 296-155 WAC, Part R.

(e) No employee must ride haulage equipment unless it is equipped with seating for each passenger and protects passengers from being struck, crushed, or caught between other equipment or surfaces. Members of train crews may ride on a locomotive if it is equipped with handholds and nonslip steps or footboards. Requirements applicable to underground construction for motor vehicle transportation of employees are found in chapter 296-155 WAC, Part M.

(f) Conveyor lockout.

(i) Conveyors must be deenergized and locked out with a padlock, and tagged out with a "Do Not Operate" tag at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(ii) Tags or push button stops are not acceptable.

(iii) You must not allow people to walk on conveyors except for emergency purposes and then only after the conveyor has been deenergized and locked out in accordance with (f) above, and persons can do so safely.

(g) You must not leave powered mobile haulage equipment, including trains, unattended unless the master switch or motor is turned off; operating controls are in neutral or park position; and the brakes are set, or equivalent precautions are taken to prevent rolling.

(h) Whenever rails serve as a return for a trolley circuit, both rails must be bonded at every joint and crossbonded every 200 feet (60.96 m).

(i) When dumping cars by hand, the car dumps must have tiedown chains, bumper blocks, or other locking or holding devices to prevent the cars from overturning.

(j) Rocker-bottom or bottom-dump cars must be equipped with positive locking devices to prevent unintended dumping.

(k) You must load and secure equipment to be hauled to prevent sliding or dislodgement.

(l)(i) You must stop mobile equipment, including rail-mounted equipment, for manual connecting or service work, and;

(ii) Employees must not reach between moving cars during coupling operations.

(iii) You must not align, shift, or clean couplings on moving cars or locomotives.

(iv) You must use safety chains or other connections in addition to couplers to connect person cars or powder cars whenever the locomotive is uphill of the cars.

(v) When the grade exceeds one percent and there is a potential for runaway cars, you must use safety chains or other connections in addition to couplers to connect haulage cars or, as an alternative, the locomotive must be downhill of the train.

(vi) Such safety chains or other connections must be capable of maintaining connection between cars in the event of either coupler disconnect, failure or breakage.

(m) Parked rail equipment must be chocked, blocked, or have brakes set to prevent inadvertent movement.

(n) You must provide berms, bumper blocks, safety hooks, or equivalent means to prevent overtravel and overturning of haulage equipment at dumping locations.

(o) You must provide bumper blocks or equivalent stopping devices at all track dead ends.

(p)(i) Only small handtools, lunch pails, or similar small items may be transported with employees in person cars, or on top of a locomotive.

(ii) When small hand tools or other small items are carried on top of a locomotive, the top must be designed or modified to retain them while traveling.

(q)(i) Where switching facilities are available, you must pull occupied personnel cars; you must not push them. If personnel cars must be pushed and visibility of the track ahead is hampered, then a qualified person must be stationed in the lead car to give signals to the locomotive operator.

(ii) Crew trips must consist of personnel loads only.

(21) **Electrical safety.** This subsection applies in addition to the general requirements for electrical safety which are found in Part I of this chapter.

(a) Electric power lines must be insulated or located away from water lines, telephone lines, air lines, or other conductive materials so that a damaged circuit will not energize the other systems.

(b) Lighting circuits must be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

(c) You must not use oil-filled transformers underground unless they are located in a fire-resistant enclosure suitably vented to the outside and surrounded by a dike to retain the contents of the transformers in the event of rupture.

(22) Hoisting unique to underground construction except as modified by this section, the provisions of chapter 296-155 WAC, Part L apply. Requirements for personnel hoists, material hoists, and elevators are found in Part R of this chapter and in this subsection.

(a) General requirements for cranes and hoists.

(i) You must secure or stack materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, in a manner to prevent the load from shifting, snagging, or falling into the shaft.

(ii) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances must flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This subsection does not apply to fully enclosed hoistways.

(iii) Whenever a hoistway is not fully enclosed and employees are at the shaft bottom, you must stop conveyances or equipment at least 15 feet (4.57 m) above the bottom of the shaft and held there until the signalperson at the bottom of the shaft directs the operator to continue lowering the load, except that the load may be lowered without stopping if the load or conveyance is within full view of a bottom signalperson who is in constant voice communication with the operator.

(iv)(A) Before maintenance, repairs, or other work is commenced in the shaft served by a cage, skip, or bucket, you must inform the operator and other employees in the area and give them suitable instructions.

(B) You must install a sign warning that work is being done in the shaft at the shaft collar, at the operator's station, and at each underground landing.

(v) Any connection between the hoisting rope and the cage or skip must be compatible with the type of wire rope used for hoisting.

(vi) You must maintain spin-type connections, where used, in a clean condition and protected from foreign matter that could affect their operation.

(vii) Cage, skip, and load connections to the hoist rope must be made so that the force of the hoist pull, vibration, misalignment, release of lift force, or impact will not disengage the connection. You must use only closed shackles for cage and skip rigging.

(viii) When using wire rope wedge sockets, you must provide means to prevent wedge escapement and to ensure that the wedge is properly seated.

(b) Additional requirements for cranes. Cranes must be equipped with a limit switch to prevent overtravel at the boom tip. Limit switches are to be used only to limit travel of loads when operational controls malfunction and you must not use them as a substitute for other operational controls.

(c) Additional requirements for hoists.

(i) Hoists must be designed so that the load hoist drum is powered in both directions of rotation, and so that brakes are automatically applied upon power release or failure.

(ii) Control levers must be of the "deadman type" which return automatically to their center (neutral) position upon release.

(iii) When a hoist is used for both personnel hoisting and material hoisting, load and speed ratings for personnel and for materials must be assigned to the equipment.

(iv) You must not use hoist machines with cast metal parts.

(v) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(vi) Employees must not ride on top of any cage, skip, or bucket except when necessary to perform inspection or maintenance of the hoisting system, in which case you must protect them by a body belt/harness system to prevent falling in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.

(vii) You must not hoist personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(viii) Line speed must not exceed the design limitations of the systems.

(ix) Hoists must be equipped with landing level indicators at the operator's station. Marking of the hoist rope does not satisfy this requirement.

(x) Whenever glazing is used in the hoist house, it must be safety glass, or its equivalent, and be free of distortions and obstructions.

(xi) A fire extinguisher that is rated at least 2A:10B:C (multi-purpose, dry chemical) must be mounted in each hoist house.

(xii) Hoist controls must be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(xiii) Hoists must be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(xiv) You must not use limit switches are to be used only to limit travel of loads when operational controls malfunction and as a substitute for other operational controls.

(xv) You must provide hoist operators with a closed-circuit voice communication system to each landing station, with speaker-microphones so located that the operator can communicate with individual landing stations during hoist use.

(xvi) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions must be guided by fenders, rails, ropes, or a combination of those means.

(xvii) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets must be rope or rail-guided to within a rail length from the sinking operation.

(xviii) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, must be rope or rail-guided for the full length of their travel.

(xix) Wire rope used in load lines of material hoists must be capable of supporting, without failure, at least 5 times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to chapter 296-155 WAC, Part R, for design factors for wire rope used in personnel hoists. The design factors must be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

(xx) A competent person must visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary.

(xxi) Each safety device must be checked by a competent person at least weekly during hoist use to ensure suitable operation and safe condition.

(xxii) In order to ensure suitable operation and safe condition of all functions and safety devices, you must inspect and load-test each hoist assembly to 100% of its rated capacity: At the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. You must prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. You must maintain the most recent certification record on file until completion of the project.

(xxiii) Before hoisting personnel or material, the operator must perform a test run of any cage or skip whenever it has been out of service for one complete shift, and whenever the assembly or components have been repaired or adjusted.

(xiv) You must correct unsafe conditions before using the equipment.

(d) Additional requirements for personnel hoists.

(i) Hoist drum systems must be equipped with at least two means of stopping the load, each of which must be capable of stopping and holding 150% of the hoist's rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this subsection.

(ii) The operator must remain within sight and sound of the signals at the operator's station.

(iii) All sides of personnel cages must be enclosed by one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) to a height of not less than 6 feet (1.83 m). However, when the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion.

(iv) All personnel cages must be provided with a positive locking door that does not open outward.

(v) All personnel cages must be provided with a protective canopy. The canopy must be made of steel plate, at least 3/16-inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy must be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy must cover the top in such a manner as to protect those inside from objects falling in the shaft.

(vi) Personnel platforms operating on guide rails or guide ropes must be equipped with broken-rope safety devices, safety catches, or arrestment devices that will stop and hold 150 percent of the weight of the personnel platform and its maximum rated load.

(vii) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform must not exceed 200 feet (60.96 m) per minute. You must install governor controls set for 200 feet (60.96 m) per minute in the control system and they must be used during personnel hoisting.

(viii) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(ix) The personnel platform may travel at rated speeds greater than 600 feet (182.88 m) per minute in complete shafts.

AMENDATORY SECTION (Amending WSR 16-09-085, filed 4/19/16, effective 5/20/16)

WAC 296-155-740 Cofferdams. (1) If overtopping of the cofferdam by high waters is possible, you must provide means for controlled flooding of the work area.

(2) You must develop and post signals for evacuation of employees in case of emergency.

(3) You must provide cofferdam walkways, bridges, or ramps with at least two means of rapid exit and guardrails as specified in (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(4) You must install manways and ladderways separately from the hoistways and partitioned off to prevent hoisted materials from protruding into or falling into manways and/or ladderways.

(5) Pumping equipment must be located on substantially constructed platforms and where installed in such a position that persons must work below, toe boards must be installed on the platform.

(6) You must protect cofferdams located close to navigable shipping channels from vessels in transit, where possible.

WAC 296-155-745 Compressed air. (1) General provisions.

(a) There must be present, at all times, at least one competent person designated by and representing the employer, who must be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) You must instruct every employee in the rules and regulations which concern their safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) You must retain one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. They must be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. They must be physically qualified and be willing to enter a pressurized environment.

(b) You must not permit any employee to enter a compressed air environment until they have been examined by the physician and reported to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, they must not resume work until they are reexamined by the physician, and their physical condition reported, as provided in this subsection, to be such as to permit them to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed one year, the employee must be reexamined by the physician to determine if they are still physically qualified to engage in compressed air work.

(e) Such physician must at all times keep a complete and full record of examinations made by themselves. The physician must also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records must be available for the inspection by the director or their representatives, and a copy thereof must be forwarded to the department within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It must state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) You must provide a fully equipped first-aid station at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case must be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, you must provide a first-aid station and transportation facilities at each portal.

(i) You must establish and maintain a medical lock in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock must:

- (i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;
- (ii) Be readily accessible to employees working under compressed air;
- (iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;
- (iv) Be properly heated, lighted and ventilated;
- (v) Be maintained in a sanitary condition;
- (vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;
- (vii) Be designed for a working pressure of 75 p.s.i.g.;
- (viii) Be equipped with internal controls which may be overridden by external controls;
- (ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;
- (x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;
- (xi) Be provided with oxygen lines and fittings leading into external tanks. The lines must be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber must be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.
- (xii) Be in constant charge of an attendant under the direct control of the retained physician. You must train the attendant in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;
- (xiii) Be adjacent to an adequate emergency medical facility;
- (xiv) The medical facility must be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH);
- (xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and
- (xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.
- (k) You must furnish identification badges to all employees, indicating that the wearer is a compressed air worker. You must keep a permanent record of all identification badges issued. The badge must give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer must be rushed to the medical lock. The badge must be worn at all times—off the job, as well as on the job.
- (3) **Telephone and signal communication.** You must maintain effective and reliable means of communication, such as bells, whistles, or telephones, at all times between all the following locations;
 - (a) The working chamber face;
 - (b) The working chamber side of the man lock near the door;
 - (c) The interior of the man lock;
 - (d) Lock attendant's station;
 - (e) The compressor plant;
 - (f) The first-aid station;
 - (g) The emergency lock (if one is required); and

(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) You must post the time of decompression in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK

..... pounds to pounds in minutes.

..... pounds to pounds in minutes.

(Signed by).....

(Superintendent)

You must post this form in the man lock at all times.

(b) You must conspicuously post any code of signals used near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, you must keep a record of employees employed under air pressure by an employee who must remain outside the lock near the entrance. This record must show the period each employee spends in the air chamber and the time taken from decompression. You must submit a copy to the appointed physician after each shift.

(5) Compression.

(a) You must instruct every employee going under air pressure for the first time on how to avoid excessive discomfort.

(b) During the compression of employees, you must not increase the pressure to more than 3 p.s.i.g. within the first minute. You must hold the pressure at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute you must raise the pressure uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, you must hold the pressure to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant must gradually reduce the pressure until the employee signals that the discomfort has ceased. If the employee does not indicate that the discomfort has disappeared, the lock attendant must reduce the pressure to atmospheric and the employee must be released from the lock.

(e) You must not subject any employee to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition must be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician must be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician must establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression must not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, you must not permit any employees employed in compressed air to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock must be under the direct supervision of the appointed physician. The lock attendant must be stationed at the lock controls on the free air side during the period of compression and decompression and must remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock must be equipped with automatic controls which, through taped programs, cams, or similar apparatus, must automatically regulate decompressions. It must also be equipped with manual controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, must be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph must be installed outside of each man lock and must be changed prior to each shift's decompression. The chart must be of sufficient size to register a legible record of variations in pressure within the man lock and must be visible to the lock attendant. You must submit a copy of each graph to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer must also be installed in each man lock. Additional fittings must be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, must have at least two locks in perfect working condition, one of which must be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock must be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks must be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There must be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock must be large enough so that those using it are not compelled to be in a cramped position and must not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons must be so located that the bottom door must be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, you must maintain an accurate pressure gauge on the outer and inner side of each bulkhead. These gauges must be accessible at all times and you must keep them in accurate working order.

(xii) Man locks must have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) You must provide adequate ventilation in the lock.

(xiv) You must maintain man locks at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, you must keep lock doors open to the working chamber, where practicable.

(xvi) You must make provisions to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) You must provide a special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber must be not less than a minimum 7 feet and the cubical content must provide at least 50 cubic feet of airspace for each employee. For each occupant, you must provide 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. You must base the rated capacity on the stated minimum space per employee and you must post it at the chamber entrance. You must not exceed the posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber must be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers must be so arranged as to permit a normal sitting posture without cramping. You must provide seating space, not less than 18 inches by 24 inches wide, per occupant.

(iv) You must provide adequate toilet and washing facilities, in a screened or enclosed recess. Toilet bowls must have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water must be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind must be permitted to accumulate, and you must keep the chamber clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber must be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. You must provide a passageway, connecting the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway

must be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there must be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who must regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there must be a gauge tender for each caisson.

(b) The low air compressor plant must be of sufficient capacity to not only permit the work to be done safely, but must also provide a margin to meet emergencies and repairs.

(c) Low air compressor units must have at least two independent and separate sources of power supply and each must be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors must be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) You must periodically switch from one independent source of power supply to the other to ensure that workability of the apparatus in an emergency.

(f) You must provide duplicate low-pressure air feedlines and regulating valves between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines must be equipped with check valves.

(h) Low-pressure air must be regulated automatically. In addition, you must provide manually operated valves for emergency conditions.

(i) The air intakes for all air compressors must be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber must be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) You must provide and operate exhaust valves and exhaust pipes so that the working chamber is well ventilated, and there are no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air must be not less than 30 cubic feet per minute.

(b) You must analyze the air in the workplace not less than once each shift, and you must keep records of such tests on file at the place where the work is in progress. The test results must be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, you must take immediate action to correct the situation.

(c) You must maintain the temperature of all working chambers which are subjected to air pressure, by means of after-coolers or other suitable devices, at a temperature not to exceed 85°F.

(d) You must provide forced ventilation during decompression. During the entire decompression period, you must provide forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, you must provide a positive means of removing the heat build-up at the heading.

(10) Electricity.

(a) All lighting in compressed-air chambers must be by electricity exclusively, and you must use two independent electric-lighting systems with independent sources of supply. You must arrange the emergency source to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level must be not less than 10 foot-candles, and in all workplaces the lighting must at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, must comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, must be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps must be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) You must provide sanitary, heated, lighted, and ventilated dressing rooms and drying rooms for all employees engaged in compressed air work. Such rooms must contain suitable benches and lockers. You must provide bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations. You must provide one toilet for each 15 employees, or fractional part thereof.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) You must keep all parts of caissons and other working compartments in a sanitary condition.

(12) Fire prevention and protection.

(a) Firefighting equipment must be available at all times and you must maintain it in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher must stand by until such operation is completed.

(c) You must provide shafts and caissons containing flammable material of any kind, either above or below ground, with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose must be at least 1 1/2 inches in nominal diameter; the water pressure must at all times be adequate for efficient operation of the type of nozzle used; and the water supply must be such as

to ensure an uninterrupted flow. Fire hose, when not in use, must be located or guarded to prevent injury thereto.

(e) You must provide the power house, compressor house, and all buildings housing ventilating equipment, with at least one hose connection in the waterline, with a fire hose connected thereto. You must maintain a fire hose within reach of structures of wood over or near shafts.

(f) Tunnels must be provided with a two-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line must have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets must be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose must be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, you must provide at least one approved fire extinguisher of the proper type for the hazards involved. You must provide at least two approved fire extinguishers in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber must use water as the primary extinguishing agent and must not use any extinguishing agent which could be harmful to the employees in the working chamber. You must protect the fire extinguisher from damage.

(h) You must not use or store highly combustible materials in the working chamber. You must not use wood, paper, and similar combustible material in the working chamber in quantities which could cause a fire hazard. The compressor building must be constructed of noncombustible material.

(i) Man locks must be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, you must provide a fire hose and portable fire extinguisher inside and outside the man lock. The portable fire extinguisher must be the dry chemical type.

Note: For additional requirements relating to portable fire extinguishers see WAC 296-800-300.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers must be constructed of noncombustible materials. Bedding, etc., must be chemically treated so as to be fire resistant.

(k) Head frames must be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening must be built of fire-resistant materials.

(l) You must not store any oil, gasoline, or other combustible materials within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) You must take positive means to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work must be selected, stored, transported, and used as specified in part T of this chapter.

(13) **Bulkheads and safety screens.**

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, you must provide hanging walkways from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways must be constructed of noncombustible material. You must securely install standard railings throughout the length of all walkways on open sides in accordance with (~~Part C-1 of this~~) chapter 296-880 WAC, Unified safety standards for fall protection. Where walkways are ramped under safety screens, you must skidproof the walkway surface by cleats or by equivalent means.

(c) You must test bulkheads used to contain compressed air, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-301-095 Gray and white bins. Guard rails conforming to (~~WAC 296-24-750 through 296-24-75011, of the general safety and health standards,~~) chapter 296-880 WAC, Unified safety standards for fall protection must be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

WAC 296-304-01001 Definitions. Additional safety measure. A component of the tags-plus system that provides an impediment (in addition to the energy-isolating device) to the release of energy or the generalization or start-up of the machinery, equipment, or system being serviced. Examples of additional safety measures include, but are not limited to, removing an isolating circuit element; blocking a controlling switch; blocking, blanking, or bleeding lines; removing a valve handle or wiring it in place; opening an extra disconnecting device.

Affected employee. An employee who normally operates or uses the machinery, equipment, or system that is going to be serviced under lockout/tags-plus or who is working in the area where servicing is being performed under lockout/tags-plus. An affected employee becomes an authorized employee when the employer assigns the employee to service any machine, equipment, or system under a lockout/tags-plus application.

Alarm. A signal or message from a person or device that indicates that there is a fire, medical emergency, or other situation that requires emergency response or evacuation. At some shipyards, this may be called an "incident" or a "call for service."

Alarm system. A system that warns employees at the worksite of danger.

Anchorage. A secure point (~~(to attach)~~) of attachment for lifelines, lanyards, or deceleration devices which is capable of withstanding the forces specified in this chapter.

Authorized employee:

~~((1))~~ (a) An employee who performs one or more of the following lockout/tags-plus responsibilities:

~~((a))~~ (i) Executes the lockout/tags-plus procedures;

~~((b))~~ (ii) Installs a lock or tags-plus system on machinery, equipment, or systems; or

~~((c))~~ (iii) Services any machine, equipment, or system under lockout/tags-plus application.

~~((2))~~ (b) An affected employee becomes an authorized employee when the employer assigns the employee to service any machine, equipment, or system under a lockout/tags-plus application.

Body belt. A strap with means to both secure it around the waist and to attach it to a lanyard, lifeline, or deceleration device. Body belts may be used only in fall restraint or positioning device systems and may not be used for fall arrest. Body belts must be at least one and five-eighths inches (4.13 cm) wide.

Body harness. Straps to secure around an employee so that fall arrest forces are distributed over at least the thighs, shoulders, chest and pelvis with means to attach it to other components of a personal fall arrest system.

Capable of being locked out. An energy-isolating device is capable of being locked out if it has a locking mechanism built into it, or it has a hasp or other means of attachment to which, or through which, a lock can be affixed. Other energy-isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy-control capability.

Class II standpipe system. A one and one-half inch (3.8 cm) hose system which provides a means for the control or extinguishment of incipient stage fires.

Cold work. Work that does not involve riveting, welding, burning, or other fire-producing or spark-producing operations.

Contract employer. An employer, such as a painter, joiner, carpenter, or scaffolding subcontractor, who performs work under contract to the host employer or to another employer under contract to the host employer at the host employer's worksite. This excludes employers who provide incidental services that are not directly related to shipyard employment (such as mail delivery or office supply and food vending services).

Competent person. A person who can recognize and evaluate employee exposure to hazardous substances or to other unsafe conditions and can specify the necessary protection and precautions necessary to ensure the safety of employees as required by these standards.

Confined space. A small compartment with limited access such as a double bottom tank, cofferdam, or other small, confined space that can readily create or aggravate a hazardous exposure.

Connector. A device used to connect parts of a personal fall arrest system or parts of a positioning device system together. It may be:

- (a) An independent component of the system (such as a carabiner);
- or
- (b) An integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness or a snaphook spliced or sewn to a lanyard or self-retracting lanyard).

Dangerous atmosphere. An atmosphere that may expose employees to the risk of death, incapacitation, injury, acute illness, or impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space).

Deceleration device. A mechanism, such as a rope grab, rip stitch lanyard, specially woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline/lanyard, that serves to dissipate a substantial amount of energy during a fall arrest, or to 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 from the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, to the location of that attachment point after the employee comes to a full stop.

Designated area. An area established for hot work after an inspection that is free of fire hazards.

Director. The director of the department of labor and industries or a designated representative.

Drop test. A method utilizing gauges to ensure the integrity of an oxygen fuel gas burning system. The method requires that the burning torch is installed to one end of the oxygen and fuel gas lines and then the gauges are attached to the other end of the hoses. The manifold or cylinder supply valve is opened and the system is pressurized. The manifold or cylinder supply valve is then closed and the gauges are watched for at least sixty seconds. Any drop in pressure indicates a leak.

Dummy load. A device used in place of an antenna to aid in the testing of a radio transmitter that converts transmitted energy into heat to minimize energy radiating outward or reflecting back to its source during testing.

Emergency operations. Activities performed by fire response organizations that are related to: Rescue, fire suppression, emergency medical care, and special operations or activities that include responding to the scene of an incident and all activities performed at that scene.

Employee. Any person engaged in ship repairing, ship building, or ship breaking or related employment as defined in these standards.

Employer. An employer with employees who are employed, in whole or in part, in ship repair, ship building and ship breaking, or related employment as defined in these standards.

Enclosed space. A space, other than a confined space, that is enclosed by bulkheads and overhead. It includes cargo holds, tanks, quarters, and machinery and boiler spaces.

Energy-isolating device. A mechanical device that, when utilized or activated, physically prevents the release or transmission of energy. Energy-isolating devices include, but are not limited to, manually operated electrical circuit breakers; disconnect switches; line valves; blocks; and any similar device used to block or isolate energy. Control-circuit devices (for example, push buttons, selector switches) are not considered energy isolating devices.

Equivalent. Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate and will provide an equal or greater degree of safety for employees than the (~~method or item~~) methods, materials, or designs specified in (~~the~~) this standard.

Fire hazard. A condition or material that may start or contribute to the spread of fire.

Fire protection. Methods of providing fire prevention, response, detection, control, extinguishment, and engineering.

Fire response. The activity taken by the employer at the time of an emergency incident involving a fire at the worksite, including fire suppression activities carried out by internal or external resources or a combination of both, or total or partial employee evacuation of the area exposed to the fire.

Fire response employee. A shipyard employee who carries out the duties and responsibilities of shipyard firefighting in accordance with the fire safety plan.

Fire response organization. An organized group knowledgeable, trained, and skilled in shipyard firefighting operations that responds to shipyard fire emergencies, including: Fire brigades, shipyard fire departments, private or contractual fire departments, and municipal fire departments.

Fire suppression. The activities involved in controlling and extinguishing fires.

Fire watch. The activity of observing and responding to the fire hazards associated with hot work in shipyard employment and the employees designated to do so.

Fixed extinguishing system. A permanently installed fire protection system that either extinguishes or controls fire occurring in the space it protects.

Flammable liquid. Means any liquid having a flashpoint at or below 199.4°F (93°C). Flammable liquids are divided into four categories as follows:

(a) Category 1 shall include liquids having flashpoints below 73.4°F (23°C) and having a boiling point at or below 95°F (35°C).

(b) Category 2 shall include liquids having flashpoints below 73.4°F (23°C) and having a boiling point above 95°F (35°C).

(c) Category 3 shall include liquids having flashpoints at or above 73.4°F (23°C) and at or below 140°F (60°C). When a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100°F (37.8°C).

(d) Category 4 shall include liquids having flashpoints above 140°F (60°C) and at or below 199.4°F (93°C). When a Category 4 flammable liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100°F (37.8°C).

(e) When liquid with a flashpoint greater than 199.4°F (93°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 4 flammable liquid.

Free fall. To fall 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 the device operates and fall arrest forces occur.

Gangway. A ramp-like or stair-like means to board or leave a vessel including accommodation ladders, gangplanks and brows.

Hazardous energy. Any energy source, including mechanical (for example, power transmission apparatus, counterbalances, springs, pressure, gravity), pneumatic, hydraulic, electrical, chemical, and thermal (for example, high or low temperature) energies, that could cause injury to employees.

Hazardous substance. A substance likely to cause injury, illness or disease, or otherwise harm an employee because it is explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful.

Health care professional. A physician or any other health care professional whose legally permitted scope of practice allows the provider to independently provide, or be delegated the responsibility to provide, some or all of the advice or consultation this subpart requires.

Hose systems. Fire protection systems consisting of a water supply, approved fire hose, and a means to control the flow of water at the output end of the hose.

Host employer. An employer who is in charge of coordinating work or who hires other employers to perform work at a multiemployer workplace.

Hot work. Riveting, welding, burning or other fire or spark producing operations.

Incident management system. A system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an "incident command system (ICS)."

Incipient stage fire. A fire, in the initial or beginning stage, which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

Inerting. The displacement of the atmosphere in a permit space by noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. This procedure produces an IDLH oxygen-deficient atmosphere.

Interior structural firefighting operations. The physical activity of fire response, rescue, or both involving a fire beyond the incipient stage inside of buildings, enclosed structures, vessels, and vessel sections.

Isolated location. An area in which employees are working alone or with little assistance from others due to the type, time, or location of their work. Such locations include remote locations or other work areas where employees are not in close proximity to others.

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

Lifeline. A component consisting of a flexible line to connect to an anchorage at one end to hang vertically (vertical lifeline), or to connect to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage) or cable used to secure a positioning harness or full body harness to a lifeline or an anchorage point usually two, four, or six feet long.

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 which is part of a fall protection system used as back-up safety for an elevated worker or as a restraint for workers on a flat or sloped surface.

Lock. A device that utilizes a positive means, either a key or combination lock, to hold an energy isolating device in a "safe" position that prevents the release of energy and the start-up or energization of the machinery, equipment, or system to be serviced.

Lockout. The placement of a lock on an energy-isolating device in accordance with an established procedure, thereby ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lock is removed.

Lockout/tags-plus coordinator. An employee whom the employer designates to coordinate and oversee all lockout and tags-plus applications on vessels or vessel sections and at landside work areas when employees are performing multiple servicing operations on the same machinery, equipment, or systems at the same time, and when employees are servicing multiple machinery, equipment, or systems on the same vessel or vessel section at the same time. The lockout/tags-plus coordinator also maintains the lockout/tags-plus log.

Lockout/tags-plus materials and hardware. Locks, chains, wedges, blanks, key blocks, adapter pins, self-locking fasteners, or other hardware used for isolating, blocking, or securing machinery, equipment, or systems to prevent the release of energy or the start-up or energization of machinery, equipment, or systems to be serviced.

Lower levels. Those areas or surfaces to which an employee can fall. Such areas or surfaces include but are not limited to ground levels, floors, ramps, tanks, materials, water, excavations, pits, vessels, structures, or portions thereof.

Motor vehicle. Any motor-driven vehicle operated by an employee that is used to transport employees, material, or property. For the purposes of this subpart, motor vehicles include passenger cars, light trucks, vans, motorcycles, all-terrain vehicles, small utility trucks, powered industrial trucks, and other similar vehicles. Motor vehicles do not include boats, or vehicles operated exclusively on a rail or rails.

Motor vehicle safety equipment. Systems and devices integral to or installed on a motor vehicle for the purpose of effecting the safe operation of the vehicle, and consisting of such systems or devices as safety belts, airbags, headlights, tail lights, emergency/hazard lights, windshield wipers, defogging or defrosting devices, brakes, horns, mirrors, windshields and other windows, and locks.

Multiemployer workplace. A workplace where there is a host employer and at least one contract employer.

Normal production operations. The use of machinery or equipment, including, but not limited to, punch presses, bending presses, shears, lathes, keel press rollers, and automated burning machines, to perform a shipyard-employment production process.

Personal alert safety system (PASS). A device that sounds a loud signal if the wearer becomes immobilized or is motionless for thirty seconds or more.

Personal fall arrest system. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, a deceleration device, a lifeline, or a suitable combination.

Physical isolation. The elimination of a fire hazard by removing the hazard from the work area (at least thirty-five feet for combustibles), by covering or shielding the hazard with a fire-resistant material, or physically preventing the hazard from entering the work area.

Physically isolated. Positive isolation of the supply from the distribution piping of a fixed extinguishing system. Examples of ways to physically isolate include: Removing a spool piece and installing a blank flange; providing a double block and bleed valve system; or completely disconnecting valves and piping from all cylinders or other pressure vessels containing extinguishing agents.

Portable toilet. A nonsewered portable facility for collecting and containing urine and feces. A portable toilet may be either flushable or nonflushable. For purposes of this section, portable toilets do not include privies.

Portable unfired pressure vessel. A pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure. This does not include pressure vessels built to Department of Transportation regulations under 49 C.F.R. Part 178, Subparts C and H.

Positioning device system. A (~~body belt or body harness system rigged to allow an employee to be supported at an elevated vertical surface, such as a wall or window, and to be able to work with both hands free while leaning~~) full body harness or positioning harness that is worn by an employee, and is rigged to allow an employee to be supported on an elevated vertical or inclined surface, such as a wall, pole or column, and work with both hands free from the body support.

Potable water. Water that meets the standards for drinking purposes of the state or local authority having jurisdiction, or water that meets the quality standards prescribed by the U.S. Environmental Protection Agency's National Primary Water Regulations (40 C.F.R. Part 141).

Powder actuated fastening tool. A tool or machine that drives a stud, pin, or fastener by means of an explosive charge.

Protected space. Any space into which a fixed extinguishing system can discharge.

Proximity firefighting. Specialized firefighting operations that require specialized thermal protection and may include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Proximity firefighting operations usually are exterior operations but may be combined with structural firefighting operations. Proximity firefighting is not entry firefighting.

Qualified instructor. A person with specific knowledge, training, and experience in fire response or fire watch activities to cover the material found in WAC 296-304-01019 (2) or (3).

Qualified person. ~~((A person who has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work by possessing a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience.))~~ 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.

Readily accessible/available. Capable of being reached quickly enough to ensure, for example, that emergency medical services and first-aid intervention are appropriate or that employees can reach sanitation facilities in time to meet their health and personal needs.

Related employment. Any employment related to or performed in conjunction with ship repairing, ship building or ship breaking work, including, but not limited to, inspecting, testing, and serving as a watchman.

Rescue. Locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and transporting the injured to an appropriate health care facility.

Restraint ~~((tether))~~ line. A line from ~~((an))~~ a fixed anchorage ~~((r))~~ or between two anchorages ~~((r))~~ to which ~~((the))~~ an employee is secured ~~((se))~~ in such a way as to prevent the employee from ~~((walking or))~~ falling ~~((off an elevated work surface))~~ to a lower level.

Note: A restraint line is not necessarily designed to withstand forces resulting from a fall.

Rope grab. ~~((deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee. A rope grab usually uses the principle of inertial locking, cam/level locking or both))~~ 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 full body 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. See WAC 296-880-40025.

Sanitation facilities. Facilities, including supplies, maintained for employee personal and health needs such as potable drinking water, toilet facilities, hand-washing and hand-drying facilities, showers (including quick-drenching or flushing) and changing rooms, eating and drinking areas, first-aid stations, and on-site medical-service areas.

Sanitation supplies include soap, waterless cleaning agents, single-use drinking cups, drinking water containers, toilet paper, and towels.

Serviceable condition. The state or ability of supplies or goods, or of a tool, machine, vehicle, or other device, to be used or to operate in the manner prescribed by the manufacturer.

Servicing. Workplace activities that involve the construction, installation, adjustment, inspection, modification, testing, or repair of machinery, equipment, or systems. Servicing also includes maintaining machines, equipment, or systems when performing these activities would expose the employee to harm from the start-up or energization of the system being serviced, or the release of hazardous energy.

Sewered toilet. A fixture maintained for the purpose of urination and defecation that is connected to a sanitary sewer, septic tank, holding tank (bilge), or on-site sewage-disposal treatment facility, and that is flushed with water.

Shall or must. Mandatory.

Shield. To install a covering, protective layer, or other effective measure on or around steam hoses or temporary steam-piping systems, including metal fittings and couplings, to protect employees from contacting hot surfaces or elements.

Ship breaking. Breaking down a vessel's structure to scrap the vessel, including the removal of gear, equipment or any component part of a vessel.

Ship building. Construction of a vessel, including the installation of machinery and equipment.

Ship repairing. Repair of a vessel including, but not limited to, alterations, conversions, installations, cleaning, painting, and maintenance.

Shipyard firefighting. The activity of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, aircraft, or similar properties involved in a fire or emergency situation.

Short bight. A loop created in a line or rope that is used to tie back or fasten objects such as hoses, wiring, and fittings.

Small hose system. A system of hoses ranging in diameter from 5/8" (1.6 cm) up to 1 1/2" (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

Standpipe. A fixed fire protection system consisting of piping and hose connections used to supply water to approved hose lines or sprinkler systems. The hose may or may not be connected to the system.

Tag. A prominent warning device that includes a means of attachment that can be securely fastened to an energy-isolating device in accordance with an established procedure to indicate that the energy-isolating device and the equipment being controlled must not be operated until the tag is removed by an authorized employee.

Tags-plus system. A system to control hazardous energy that consists of an energy-isolating device with a tag affixed to it, and at least one additional safety measure.

Verification of isolation. The means necessary to detect the presence of hazardous energy, which may involve the use of a test instrument (for example, a voltmeter), and, for other than electric shock protection, a visual inspection, or a deliberate attempt to start-up the machinery, equipment, or system.

Vermin. Insects, birds, and other animals, such as rodents, that may create safety and health hazards for employees.

Vessel. Every watercraft for use as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

Vessel section. A subassembly, module, or other component of a vessel being built or repaired.

Walkway. Any surface, whether vertical, slanted, or horizontal, on which employees walk, including areas that employees pass through, to perform their job tasks. Walkways include, but are not limited to, access ways, designated walkways, aisles, exits, gangways, ladders, ramps, stairs, steps, passageways, and scaffolding. If an area is, or could be, used to gain access to other locations, it is to be considered a walkway.

Work area. A specific area, such as a machine shop, engineering space, or fabrication area, where one or more employees are performing job tasks.

Working surface. Any surface where work is occurring, or areas where tools, materials, and equipment are being staged for performing work.

Worksite. A general work location where one or more employees are performing work, such as a shipyard, pier, barge, vessel, or vessel section.

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-304-05005 Guarding of deck openings and edges. ((1) When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings must be suitably covered or guarded to a height of not less than 30 inches, except where the use of such guards is made impracticable by the work actually in progress.

(2) When employees are working around open hatches not protected by coamings to a height of 24 inches or around other large openings, the edge of the opening must be guarded in the working area to a height of 36 to 42 inches, except where the use of such guards is made impracticable by the work actually in progress.

(3) When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges must be guarded by adequate guardrails meeting the requirements of WAC 296-304-05001 (9)(a) and (b), unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.

(4) When employees are working near the unguarded edges of decks of vessels afloat, they must be protected by buoyant personal flotation devices, meeting the requirements of WAC 296-304-09017(1).

(5) Sections of bilges from which floor plates or gratings have been removed must be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two 10-inch planks placed side by side, or equivalent, must be laid across the opening to provide a safe walking surface.

(6) Gratings, walkways, and catwalks, from which sections or ladders have been removed, must be barricaded with adequate guardrails.) See chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-304-05013 Working surfaces. (1) When firebox floors present tripping hazards of exposed tubing or of missing or removed refractory, sufficient planking to afford safe footing must be laid while work is being carried on within the boiler.

(2) You must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.

(a) Employees must be protected by the use of scaffolds, ladders, or personal protection equipment according to ~~((WAC 296-304-09021, or 296-304-09023))~~ chapter 296-880 WAC, Unified safety standards for fall protection.

(b) Employees must work from scaffolds when visually restricted by:

- (i) Blasting hoods;
- (ii) Welding helmets; and
- (iii) Burning goggles; except:

(A) For the initial and final welding or burning operation to start or complete a job such as the erection and dismantling of hung scaffolding; or

(B) Other similar, nonrepetitive jobs of brief duration.

(3) For work performed in restricted quarters, such as behind boilers and in between congested machinery units and piping, work platforms at least 20 inches wide meeting the requirements of WAC 296-304-05001 (8)(b) must be used. Backrails may be omitted if bulkheading, boilers, machinery units, or piping afford proper protection against falling.

(4) When employees are boarding, leaving, or working from small boats or floats, they must be protected by personal flotation devices meeting the requirements of WAC 296-304-09017(1).

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-304-09019 Fall protection—General requirement. You must provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-304-09021 Personal fall arrest systems (PFAS). Personal fall arrest systems must ~~((meet the requirements of this section.~~

~~(1) You must ensure that connectors and anchorages meet the following criteria:~~

~~(a) Connectors are made of drop forged, pressed, or formed steel or of materials with equivalent strength.~~

~~(b) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to the interfacing parts of the system.~~

~~(c) D-rings and snaphooks can sustain a minimum tensile load of 5,000 pounds (22.24 Kn).~~

~~(d) D-rings and snaphooks are proof-tested to a minimum tensile load of 3,600 pounds (16 Kn) without cracking, breaking, or being permanently deformed.~~

~~(e) Snaphooks lock and are designed and used to prevent disengagement of the snaphook by contact of the snaphook keeper with the connected part.~~

~~(f) On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used for connection to the horizontal lifeline can lock in any direction on the lifeline.~~

~~(g) Anchorages used for attachment of personal fall arrest equipment are independent of any anchorage used to support or suspend platforms.~~

~~(h) Anchorages can support at least 5,000 pounds (22.24 Kn) per employee attached, or are designed, installed, and used as follows:~~

~~(i) As part of a complete personal fall arrest system that maintains a safety factor of at least two; and~~

~~(ii) Under the direction and supervision of a qualified person.~~

~~(2) You must ensure that lifelines, lanyards, and personal fall arrest systems meet the following criteria:~~

~~(a) When vertical lifelines are used, each employee has a separate lifeline.~~

~~(b) Vertical lifelines and lanyards have a minimum tensile strength of 5,000 pounds (22.24 Kn).~~

~~(c) Self-retracting lifelines and lanyards that automatically limit free fall distances to 2 feet (0.61 m) or less can sustain a minimum tensile load of 3000 pounds (13.34 Kn) applied to a self-retracting lifeline or lanyard with the lifeline or lanyard in the fully extended position.~~

~~(d) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards and tearing and deforming lanyards can sustain a minimum static tensile load of 5,000 pounds (22.24 Kn) applied to the device when they are in the fully extended position.~~

~~(e) Horizontal lifelines are designed, installed, and used under the supervision of a qualified person, and only used as part of a complete personal fall arrest system that maintains a safety factor of at least two.~~

Note: The system strength needs below are based on a maximum combined weight of employee and tools of 310 pounds. If combined weight is more than 310 pounds (140.62 kg), appropriate allowances must be made or the system will not be in compliance.

~~(f) Effective April 20, 1998, you must ensure that personal fall arrest systems:~~

~~(i) Limit the maximum arresting force on a falling employee to 1,800 pounds (8 Kn) when used with a body harness;~~

~~(ii) Bring a falling employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and~~

~~(iii) Are strong enough to withstand twice the potential impact energy of an employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less.~~

~~(g) You must ensure that personal fall arrest systems are rigged so that an employee can neither free fall more than 6 feet (1.83 m) nor contact any lower level.~~

~~(3) You must select, use, and care for systems and system components according to the following requirements:~~

~~(a) Lanyards are attached to employees using personal fall arrest systems, as follows:~~

~~The attachment point of a body harness is in the center of the wearer's back near the shoulder level, or above the wearer's head. If the maximum free fall distance is less than 20 inches, the attachment point may be located in the chest position.~~

~~(b) Ropes and straps (webbing) used in lanyards, lifelines and strength components of body harnesses are made from synthetic fibers or wire rope.~~

~~(c) Ropes, harnesses, and lanyards are compatible with their hardware.~~

~~(d) Lifelines and lanyards are protected against cuts, abrasions, burns from hot work operations and deterioration by acids, solvents, and other chemicals.~~

~~(e) Personal fall arrest systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.~~

~~(f) Personal fall arrest systems and components subjected to impact loading are immediately removed from service and not used again for employee protection until inspected and determined by a qualified persons to be undamaged and suitable for reuse.~~

~~(g) You must provide for prompt rescue of employees in the event of a fall or must ensure that employees are able to rescue themselves.~~

~~(h) Personal fall arrest systems and components are used only for employee fall protection and not to hoist materials.~~

~~(4) Training. Before using personal fall arrest equipment, you must ensure that each affected employee is trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees must also be trained to demonstrate the proper use, inspection, and storage of their equipment)) be in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.~~

AMENDATORY SECTION (Amending WSR 17-18-075, filed 9/5/17, effective 10/6/17)

WAC 296-304-09023 Positioning device systems. You must ensure that positioning device systems and their use ((~~meet the requirements of this section.~~

~~(1) You must ensure that connectors and anchorages meet the following criteria:~~

~~(a) Connectors have a corrosion-resistant finish, and all surfaces and edges are smooth to prevent damage to interfacing parts of this system.~~

~~(b) Connecting assemblies have a minimum tensile strength of 5,000 pounds (22.24 Kn).~~

~~(c) Positioning device systems are secured to an anchorage that can support at least twice the potential impact load of an employee's fall.~~

~~(d) Only locking type snaphooks are used in positioning device systems.~~

~~(2) You must ensure that positioning device systems meet the following criteria:~~

~~(a) Restraint (tether) lines have a minimum breaking strength of 3,000 pounds (13.34 Kn).~~

~~(b) Beginning April 20, 1998, the following system performance criteria for positioning device systems are met:~~

~~(i) A window cleaner's positioning system can withstand without failure, a drop test consisting of a 6-foot (1.83 m) drop of a 250-pound (113.34 kg) weight. The system limits the initial arresting force to a maximum of 2,000 pounds (8.89 Kn), with a maximum duration of 2 milliseconds. The system limits any subsequent arresting forces imposed on the falling employee to a maximum of 1,000 pounds (4.45 Kn);~~

~~(ii) All other positioning device systems can withstand without failure a drop test consisting of a 4-foot (1.22 m) drop of a 250-pound (113.34 kg) weight.~~

~~(3) You must ensure that a positioning device system is used and cared for according to the following requirements:~~

~~(a) Positioning device systems are inspected before each use for mildew, wear, damage, and other deterioration. Defective components are removed from service.~~

~~(b) A positioning device system or component subjected to impact loading is immediately removed from service and not used again for employee protection, unless inspected and determined by a qualified person to be undamaged and suitable for reuse.~~

~~(4) Training. Before using a positioning device system, you must ensure that employees are trained in the application limits, proper hook-up, anchoring and tie-off techniques, methods of use, inspection, and storage of positioning device systems) be in accordance with chapter 296-880 WAC, Unified safety standards for fall protection.~~

WAC 296-307-25003 What definitions apply to this section?

~~("Floor hole" means an opening with the smallest dimension between one and 12 inches, in any floor, platform, pavement, or yard, through which materials may fall but not people. Examples are a belt hole, pipe opening, or slot opening.~~

~~"Floor opening" means an opening with the smallest dimension of 12 inches or more, in any floor, platform, pavement, or yard, through which people may fall. Examples are a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this definition.~~

~~"Handrail" means a single bar or pipe supported on brackets from a wall or partition to furnish persons with a handhold in case of tripping)) "Handrail" is a rail used to provide employees with a handhold for support.~~

"Hole" means gap or void two inches or more in its least dimension, in a floor, roof, or other surface.

"Opening" means a gap or void thirty inches (76 cm) or more high and eighteen inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

"Platform" means a ((working space for people that is)) work surface elevated above the surrounding floor or ground((, such as a balcony or platform for the operation of machinery and equipment)).

"Runway" means a passageway ((used by people that is)) for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

"Stair railing" means a vertical barrier along exposed sides of a stairway to prevent people from falling.

"Standard railing" means a vertical barrier along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent people from falling.

"Standard strength and construction" means any construction of railings, covers, or other guards that meets the requirements of this section.

~~("Stair railing" means a vertical barrier along exposed sides of a stairway to prevent people from falling.))~~

"Toeboard" means a vertical barrier at floor level along ((exposed)) open sides or edges of a floor opening, ((wall opening,)) platform, runway, ((or)) ramp, or other walking/working surface to prevent materials, tools, or debris from falling onto persons passing through or working in the area below.

~~("Wall hole" means an opening between one and 30 inches high, of any width, in any wall or partition, such as a ventilation hole or drainage scupper.~~

~~"Wall opening" means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which people may fall, such as a yard-arm doorway or chute opening.))~~

WAC 296-307-25009 What protection must an employer provide for ((floor)) openings? (1) Every stairway floor opening must be guarded by a standard railing constructed according to this section. The railing must guard all exposed sides (except the entrance to the stairway). Infrequently used stairways where traffic across the opening prevents using a fixed standard railing (as when located in aisle spaces, etc.), may use an alternate guarding method. In these cases, the guard must have a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at the entrance to the stairway). See chapter 296-880 WAC, Unified safety standards for fall protection.

~~(2) ((Every ladderway floor opening or platform must be guarded by a standard railing with standard toeboard on all exposed sides (except at the entrance to the opening). The passage through the railing must have either a swinging gate or offset so that a person cannot walk directly into the opening.~~

~~(3) Every hatchway and chute floor opening must be guarded by one of the following:~~

~~(a) A hinged floor opening cover of standard strength and construction with standard railings, or a permanent cover with only one side exposed. When the opening is not in use, the cover must be closed or the exposed side must be guarded at both the top and middle by removable standard railings.~~

~~(b) A removable railing with toeboard on a maximum of two sides of the opening and with fixed standard railings and toeboards on all other exposed sides. The removable railings must be kept in place when the opening is not in use and should be hinged or mounted to be easily replaced.~~

~~(4)) When employees must feed material into any hatchway or chute opening, you must provide protection to prevent people from falling through the opening. See chapter 296-880 WAC, Unified safety standards for fall protection.~~

~~((5)) (3) When practical, the area under floor openings must be fenced off. Otherwise, the area must be plainly marked with yellow lines and telltales hanging within 5-1/2 feet of the ground or floor level.~~

~~((6)) (4) Where floor openings are used to drop materials from one level to another, audible warning systems must be installed and used to indicate to employees on the lower level when material is dropped.~~

~~((7) Every skylight opening and hole must be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.~~

~~(8) Every infrequently used pit and trapdoor floor opening must be guarded by a floor opening cover of standard strength and construction that should be hinged in place. When the cover is not in place, the pit or trap opening must be constantly attended or protected on all exposed sides by removable standard railings.~~

~~(9) Every manhole floor opening must be guarded by a standard manhole cover. The manhole cover may be left unhinged. When the cover is removed, the manhole opening must be constantly attended or protected by removable standard railings.~~

~~(10) Every temporary floor opening must have standard railings or must be constantly attended.~~

~~(11) Every floor hole that people can accidentally walk into must be guarded by either:~~

~~(a) A standard railing with standard toeboard on all exposed sides; or~~

~~(b) A floor hole cover of standard strength and construction that should be hinged in place. While the cover is not in place, the floor hole must be constantly attended or protected by a removable standard railing.~~

~~(12) Every floor hole surrounded by fixed machinery, equipment, or walls that prevent people from walking into it, must be protected by a cover that leaves openings a maximum of one inch wide. The cover must be securely held in place to prevent tools or materials from falling through.~~

~~(13) Where doors or gates open directly on a stairway, a platform must be provided so that the swing of the door does not reduce the platform width to less than 20 inches.)~~

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-25012 What protection must an employer provide for ((wall)) openings and holes? ~~((1) Every wall opening from which there is a drop of more than 4 feet must be guarded by one of the following:~~

~~(a) A rail, roller, picket fence, half door, or equivalent barrier.~~

~~The guard may be removable but should be hinged or mounted so it can be easily replaced. When employees working below the opening are exposed to falling materials, a removable toeboard or the equivalent must also be provided. When the opening is unused, the guard must be kept in position even with a door on the opening. In addition, a grab handle must be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.~~

~~(b) An extension platform onto which materials can be hoisted for handling, and that has side rails or equivalent guards of standard specifications.~~

~~(2) Every chute wall opening from which there is a drop of more than 4 feet must be guarded according to subsection (1) of this section or as required by the conditions.~~

~~(3) Every window wall opening at a stairway landing, floor, platform, or balcony, 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 platform or landing, must be guarded by standard slats, standard grillwork according to WAC 296-307-25042(3), or a standard railing.~~

~~Where the window opening is below the landing, or platform, a standard toeboard must be provided.~~

~~(4) Every temporary wall opening must have adequate guards that may be of less than standard construction.~~

~~(5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole is more than 5 feet above the next lower level, the hole must be protected by a standard toeboard or a solid enclosing screen, or according to WAC~~

296-307-25042(3).) See requirements in chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-25015 What protection must an employer provide for open-sided floors, platforms, and runways? (~~((1) Every open-sided floor or platform 4 feet or more above an adjacent floor or ground level must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing must have a toeboard wherever, beneath the open sides:~~

- ~~(a) A person can pass; or~~
- ~~(b) There is moving machinery; or~~
- ~~(c) Materials falling onto equipment would create a hazard.~~

~~(2) Every runway must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides that are 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard must also be provided on each exposed side.~~

~~Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted when operating conditions require, if the hazard is minimized by using a runway at least 18 inches wide. Where people entering runways become exposed to machinery, electrical equipment, or hazards other than from falling, additional guarding may be necessary.~~

~~(3) Regardless of height, all open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, or similar hazardous equipment, must be guarded with a standard railing and toeboard.~~

~~(4) Tools and loose materials must not be left on overhead platforms and scaffolds.) See requirements in chapter 296-880 WAC, Unified safety standards for fall protection.~~

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-25039 How must skylight screens be constructed and mounted? (~~(Skylight screens must be constructed and mounted to withstand a load of at least two hundred pounds applied perpendicularly anywhere on the screen. Skylight screen must be constructed and mounted so that, under ordinary loads or impacts, they will not deflect downward enough to break the glass below them. They must be constructed of grillwork with openings a maximum of four inches long or of slatwork with openings a maximum of two inches wide and any length.) See requirements in chapter 296-880 WAC, Unified safety standards for fall protection.~~

WAC 296-307-25042 What protection must an employer provide for ((wall)) openings? (~~(1) Wall opening barriers (rails, rollers, picket fences, and half doors) must be constructed and mounted, to withstand a load of at least two hundred pounds applied in any direction (except upward) at any point on the top rail.~~

~~(2) Wall opening grab handles must be at least twelve inches long and must be mounted to give 1-1/2 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle must form a structure that can withstand a load of at least two hundred pounds applied in any direction at any point of the handle.~~

~~(3) Wall opening screens must be constructed and mounted to withstand a load of at least two hundred pounds applied horizontally anywhere on the near side of the screen. They must be of solid construction, of grillwork with openings a maximum of four inches long, or of slatwork with openings a maximum of two inches wide and any length.)~~
See requirements in chapter 296-880 WAC, Unified safety standards for fall protection.

WAC 296-800-099 Definitions. Abatement action plans. Refers to your written plans for correcting a WISHA violation.

Abatement date. The date on the citation when you must comply with specific safety and health standards listed on the citation and notice of assessment or the corrective notice of redetermination.

Acceptable. As used in Electrical, WAC 296-800-280 means an installation or equipment is acceptable to the director of labor and industries, and approved:

- If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

- With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency, or by a state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in this section; or

- With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives. Refer to federal regulation 29 C.F.R. 1910.7 for definition of nationally recognized testing laboratory.

Accepted. As used in Electrical, WAC 296-800-280 means an installation is accepted if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

Access. As used in safety data sheets (SDSs) as exposure records, WAC 296-901-14014 means the right and opportunity to examine and copy exposure records.

Affected employees. As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means employees exposed to hazards identified as violations in a citation.

Analysis using exposure or medical records.

- An analysis using exposure records or medical records can be any collection of data or a statistical study. It can be based on either:

- Partial or complete information from individual employee exposure or medical records; or

- Information collected from health insurance claim records.

- The analysis is not final until it has been:

- Reported to the employer; or

- Completed by the person responsible for the analysis.

ANSI. This is an acronym for the American National Standards Institute.

Approved.

- Approved by the director of the department of labor and industries or their authorized representative, or by an organization that is specifically named in a rule, such as Underwriters' Laboratories (UL), Mine Safety and Health Administration (MSHA), or the National Institute for Occupational Safety and Health (NIOSH).

• As used in Electrical, WAC 296-800-280 means acceptable to the authority enforcing this section. The authority enforcing this section is the director of labor and industries. The definition of acceptable indicates what is acceptable to the director and therefore approved.

Assistant director. The assistant director for the WISHA services division at the department of labor and industries or his/her designated representative.

ASTM. This is an acronym for American Society for Testing and Materials.

Attachment plug or plug. As used in the basic electrical rules, WAC 296-800-280 means the attachment at the end of a flexible cord or cable that is part of a piece of electrical equipment. When it is inserted into an outlet or receptacle, it connects the conductors supplying electrical power from the outlet to the flexible cable.

Bare conductor. A conductor that does not have any covering or insulation.

Bathroom. A room maintained within or on the premises of any place of employment, containing toilets that flush for use by employees.

Biological agents. Organisms or their by-products.

Board. As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means the board of industrial insurance appeals.

Ceiling. An exposure limit that must not be exceeded during any part of the employee's workday. The ceiling must be determined over the shortest time period feasible and should not exceed fifteen minutes.

Certification. As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means refers to an employer's written statement describing when and how a citation violation was corrected.

C.F.R. This is an acronym for Code of Federal Regulations.

Chemical. Any element, chemical compound, or mixture of elements and/or compounds.

Chemical agents (airborne or contact). A chemical agent is any of the following:

- Airborne chemical agent which is any of the following:
 - Dust, solid particles suspended in air, that are created by actions such as:
 - Handling.
 - Drilling.
 - Crushing.
 - Grinding.
 - Rapid impact.
 - Detonation.
 - Decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, and grain.
 - Fume, solid particles suspended in air, that are created by condensation from the gaseous state.
 - Gas, a normally formless fluid, such as air, which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.
 - Mist, liquid droplets suspended in air. Mist is created by:
 - Condensation from the gaseous to the liquid state; or
 - Converting a liquid into a dispersed state with actions such as splashing, foaming, spraying or atomizing.
 - Vapor. The gaseous form of a substance that is normally in the solid or liquid state.

- Contact chemical agent which is any of the following:

- Corrosive. A substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

- Irritant. A substance that will induce a local inflammatory reaction upon immediate, prolonged, or repeated contact with normal living tissue.

- Toxicant. A substance that has the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

Chemical manufacturer. An employer with a workplace where one or more chemicals are produced for use or distribution.

Chemical name. The scientific designation of a chemical in accordance with one of the following:

- The nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC).

- The Chemical Abstracts Service (CAS) rules of nomenclature.

- A name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Circuit breaker.

- Is a device used to manually open or close a circuit. This device will also open the circuit automatically and without damage to the breaker when a predetermined overcurrent is applied. (600 volts nominal or less.)

- Is 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. (Over 600 volts nominal.)

Citation. Refers to the citation and notice issued to an employer for any violation of WISHA safety and health rules. A citation and notice may be referred to as a citation and notice of assessment but is more commonly referred to as a citation.

Commercial account. As used in Hazard communication, WAC 296-901-140 means an arrangement in which a retail distributor sells hazardous chemical(s) to an employer, generally in large quantities over time, and/or at costs that are below the regular retail price.

Common name. As used in Hazard communication, WAC 296-901-140 means any designation or identification such as:

- Code name.

- Code number.

- Trade name.

- Brand name.

- Generic name used to identify a chemical other than by its chemical name.

Compressed gas. A gas or mixture of gases that, when in a container, has an absolute pressure exceeding:

- 40 psi at 70°F (21.1°C); or

- 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C).

Compressed gas can also mean a liquid with a vapor pressure that exceeds 40 psi at 100°F (37.8°C).

Conductor. Wire that transfers electric power.

Container. As used in Hazard communication, WAC 296-901-140 means any container, except for pipes or piping systems, that contains a hazardous chemical. It can be any of the following:

- Bag.

- Barrel.
- Bottle.
- Box.
- Can.
- Cylinder.
- Drum.
- Reaction vessel.
- Storage tank.

Correction date. The date by which a violation must be corrected. Final orders or extensions that give additional time to make corrections establish correction dates. A correction date established by an order of the board of industrial insurance appeals remains in effect during any court appeal unless the court suspends the date.

Corrective notice. Refers to a notice changing a citation and is issued by the department after a citation has been appealed.

Corrosive. A substance that, upon contact, causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

Covered conductor. A conductor that is covered by something else besides electrical insulation.

Damp location. As used in basic electrical rules, WAC 296-800-280 means partially protected areas that are exposed to moderate moisture. Outdoor examples include roofed open porches and marquees. Interior examples include basements and barns.

Department. Those portions of the department of labor and industries responsible for enforcing the Washington Industrial Safety Act (WISHA).

Designated representative.

- Any individual or organization to which an employee gives written authorization.
- A recognized or certified collective bargaining agent without regard to written authorization.
- The legal representative of a deceased or legally incapacitated employee.

Director. The director means the director of the department of labor and industries or their designee.

Distributor. A business, other than a chemical manufacturer or importer, that supplies hazardous chemicals to other distributors or to employers.

Documentation. As used in WISHA appeals, penalties and other procedural rules, WAC 296-800-350 means material that you submit to prove that a correction is completed. Documentation includes, but is not limited to, photographs, receipts for materials and/or labor.

Dry location. As used in basic electrical rules, WAC 296-800-280 means areas not normally subjected to damp or wet conditions. Dry locations may become temporarily damp or wet, such as when constructing a building.

Dust. Solid particles suspended in air that are created by actions such as:

- Handling.
- Drilling.
- Crushing.
- Grinding.
- Rapid impact.
- Detonation.
- Decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, and grain.

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

Emergency washing facilities. Emergency washing facilities are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

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

Employee. Based on chapter 49.17 RCW, the term employee and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise.

Employee exposure record. As used in safety data sheets (SDSs) as exposure records, WAC 296-901-14014 means a record containing any of the following kinds of information:

- Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe, or other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained;

- Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (e.g., the level of a chemical in the blood, urine, breath, hair, fingernails, etc.) but not including results which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs;

- Safety data sheets indicating that the material may pose a hazard to human health; or

- In the absence of the above, a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common or trade name) of a toxic substance or harmful physical agent.

Employer. Based on chapter 49.17 RCW, an employer is any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: Provided, That any persons, partnership, or business entity not having employees, and who is covered by the Industrial Insurance Act must be considered both an employer and an employee.

Exit. Provides a way of travel out of the workplace.

Exit route. A continuous and unobstructed path of exit travel from any point within a workplace to safety outside.

Explosive. A chemical that causes a sudden, almost instant release of pressure, gas, and heat when exposed to a sudden shock, pressure, or high temperature.

Exposed live parts. Electrical parts that are:

- Not suitably guarded, isolated, or insulated; and

- Capable of being accidentally touched or approached closer than a safe distance.

Exposed wiring methods. Involve working with electrical wires that are attached to surfaces or behind panels designed to allow access to the wires.

Exposure or exposed. As used in Hazard communication, WAC 296-901-140 and safety data sheets (SDSs) as exposure records, WAC 296-901-14014. An employee has been, or may have possibly been, subjected to a hazardous chemical, toxic substance or harmful physical agent while working. An employee could have been exposed to hazardous chemicals, toxic substances, or harmful physical agents in any of the following ways:

- Inhalation.
- Ingestion.
- Skin contact.
- Absorption.
- Related means.

The terms exposure and exposed only cover workplace exposure involving a toxic substance or harmful physical agent in the workplace different from typical nonoccupational situations in the way it is:

- Used.
- Handled.
- Stored.
- Generated.
- Present.

Exposure record. See definition for employee exposure record.

Extension ladder. A portable ladder with 2 or more sections and is not self-supporting. The 2 or more sections travel in guides or brackets that let you change the length. The size of a portable ladder is determined by adding together the length of each section.

Failure-to-abate. Any violation(s) resulting from not complying with an abatement date.

Final order. Any of the following (unless an employer or other party files a timely appeal):

- Citation and notice;
- Corrective notice;
- Decision and order from the board of industrial insurance appeals;
- Denial of petition for review from the board of industrial insurance appeals; or
- Decision from a Washington State superior court, court of appeals, or the state supreme court.

Final order date. The date a final order is issued.

First aid. The extent of treatment you would expect from a person trained in basic first aid, using supplies from a first-aid kit.

Tests, such as X-rays, must not be confused with treatment.

Flammable. A chemical covered by one of the following categories:

- Aerosol flammable means a flammable aerosol as defined by WAC 296-901-14024, Appendix B—Physical hazard criteria;
- Gas, flammable means:
 - A gas that, at temperature and pressure of the surrounding area, forms a flammable mixture with air at a concentration of 13% by volume or less; or
 - A gas that, at temperature and pressure of the surrounding area, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.

• Liquid, flammable means any liquid having a flashpoint at or below 199.4°F (93°C). Flammable liquids are divided into four categories as follows:

- Category 1 must include liquids having flashpoints below 73.4°F (23°C) and having a boiling point at or below 95°F (35°C).

- Category 2 must include liquids having flashpoints below 73.4°F (23°C) and having a boiling point above 95°F (35°C).

- Category 3 must include liquids having flashpoints at or above 73.4°F (23°C) and at or below 140°F (60°C). When a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100°F (37.8°C).

- Category 4 must include liquids having flashpoints above 140°F (60°C) and at or below 199.4°F (93°C). When a Category 4 flammable liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100°F (37.8°C).

- When liquid with a flashpoint greater than 199.4°F (93°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 4 flammable liquid.

• Solid, flammable means a solid, other than a blasting agent or explosive as defined in 29 C.F.R. 1910.109(a), that is likely to cause fire through friction, moisture absorption, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily. Solid, inflammable also means that when the substance is ignited, it burns so powerfully and persistently that it creates a serious hazard. A chemical must be considered to be a flammable solid if, when tested by the method described in 16 C.F.R. 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint.

• The minimum temperature at which a liquid gives off a vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid and must be determined as follows:

- The flashpoint of liquids having a viscosity less than 45 Saybolt Universal Second(s) at 100°F (37.8°C) and a flashpoint below 175°F (79.4°C) must be determined in accordance with the Standard Method of Test for Flash Point by the Tag Closed Tester, ASTM D-56-69, or an equivalent method as defined by WAC 296-901-14024, Appendix B—Physical hazard criteria.

Flexible cords and cables. Typically used to connect electrical equipment to an outlet or receptacle. These cords can have an attachment plug to connect to a power source or can be permanently wired into the power source. Flexible cords, extension cords, cables and electrical cords are all examples of flexible cord.

~~(Floor hole. An opening in any floor, platform, pavement, or yard that measures at least one inch but less than 12 inches at its smallest dimension and through which materials and tools (but not people) can fall.~~

~~Examples of floor holes are:~~

- ~~• Belt holes.~~
- ~~• Pipe openings.~~
- ~~• Slot openings.~~

~~**Floor opening.** An opening in any floor, platform, pavement, or yard that measures at least 12 inches in its smallest dimension and through which a person can fall.~~

~~Examples of floor openings are:~~

- ~~• Hatchways.~~
- ~~• Stair or ladder openings.~~
- ~~• Pits.~~
- ~~• Large manholes.~~

~~The following are NOT considered floor openings:~~

- ~~• Openings occupied by elevators.~~
- ~~• Dumbwaiters.~~
- ~~• Conveyors.~~
- ~~• Machinery.~~
- ~~• Containers.)~~

Foreseeable emergency. As used in Hazard communication, WAC 296-901-140 means any potential event that could result in an uncontrolled release of a hazardous chemical into the workplace. Examples of foreseeable emergencies include equipment failure, rupture of containers, or failure of control equipment.

Fume. Solid particles suspended in air that are created by condensation from the gaseous state.

Gas. A normally formless fluid, such as air, which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

Ground. As used in Electrical, WAC 296-800-280, a connection between an electrical circuit or equipment and the earth or other conducting body besides the earth. This connection can be intentional or accidental.

Grounded. A connection has been made between an electrical circuit or equipment and the earth or another conducting body besides the earth.

Grounded conductor. A system or circuit conductor that is intentionally grounded.

Ground-fault circuit-interrupter. A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

Grounding conductor. Is used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

Grounding conductor, equipment. A conductor used to connect non-current-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

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 being accidentally touched or approached closer than a safe distance.

Hand-held drench hoses. Hand-held drench hoses are single-headed emergency washing devices connected to a flexible hose that can be used to irrigate and flush the face or other body parts.

Handrail. ((~~A single bar or pipe supported on brackets from a wall or partition to provide a continuous handhold for persons using a stair.~~)) A rail used to provide employees with a handhold for support.

Harmful physical agent. Any physical stress such as noise, vibration, repetitive motion, heat, cold, ionizing and nonionizing radiation, and hypo- or hyperbaric pressure which:

- Is listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS); or
- Has shown positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer; or
- Is the subject of a safety data sheet kept by or known to the employer showing that the material may pose a hazard to human health.

Hazard. Any condition, potential or inherent, which can cause injury, death, or occupational disease.

Hazard warning. As used in Hazard communication, WAC 296-901-140 can be a combination of words, pictures, symbols, or combination appearing on a label or other appropriate form of warning which shows the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s).

Note: See definition for physical hazard and health hazard to determine which hazards must be covered.

Hazardous chemical. Any chemical that is a physical or health hazard.

Health hazard. A chemical, mixture, biological agent, or physical agent that may cause health effects in short- or long-term exposed employees. Based on statistically significant evidence from at least one study conducted using established scientific principles. Health hazards include:

- Carcinogens.
- Toxic or highly toxic agents.
- Reproductive toxins.
- Irritants.
- Corrosives.
- Sensitizers.
- Hepatotoxins (liver toxins).
- Nephrotoxins (kidney toxins).
- Neurotoxins (nervous system toxins).
- Substances that act on the hematopoietic system (blood or blood-forming system).
- Substances that can damage the lungs, skin, eyes, or mucous membranes.
- Hot or cold conditions.

Hole. A gap or void two inches or more in its least dimension, in a floor, roof, or other surface.

Identity. As used in Hazard communication, WAC 296-901-140 means any chemical or common name listed on the safety data sheet (SDS) for the specific chemical. Each identity used must allow cross-references among the:

- Required list of hazardous chemicals.
- Chemical label.
- MSDSs.

Imminent danger violation. Any violation(s) resulting from conditions or practices in any place of employment, which are such that a danger exists which could reasonably be expected to cause death or serious physical harm, immediately or before such danger can be eliminated through the enforcement procedures otherwise provided by the Washington Industrial Safety and Health Act.

Importer. The first business within the Customs Territory of the USA that:

- Receives hazardous chemicals produced in other countries; and
- Supplies them to distributors or employers within the USA.

Inpatient hospitalization. To be admitted into a hospital or equivalent facility for medical treatment.

Insulated. A conductor has been completely covered by a material that is recognized as electrical insulation and is thick enough based on:

- The amount of voltage involved; and
- The type of covering material.

Interim waiver. An order granted by the department allowing an employer to vary from WISHA requirements until the department decides to grant a permanent or temporary waiver.

Irritant. A substance that will induce a local inflammatory reaction upon immediate, prolonged, or repeated contact with normal living tissue.

Ladder. Consists of 2 side rails joined at regular intervals by crosspieces called steps, rungs, or cleats. These steps are used to climb up or down.

Listed. Equipment is listed if it:

- Is listed in a publication by a nationally recognized laboratory (such as UL, underwriters laboratory) that inspects the production of that type of equipment; and
- States the equipment meets nationally recognized standards or has been tested and found safe to use in a specific manner.

Medical treatment. Treatment provided by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first-aid treatment even if provided by a physician or registered professional personnel.

Mist. Liquid droplets suspended in air. Mist is created by:

- Condensation from the gaseous to the liquid state; or
- Converting a liquid into a dispersed state with actions such as splashing, foaming, spraying or atomizing.

Mixture. As used in Hazard communication, WAC 296-901-140, any combination of 2 or more chemicals (if that combination did not result from a chemical reaction).

Movable equipment. As used in WAC 296-800-35052, a hand-held or nonhand-held machine or device;

- That is powered or nonpowered; and
- Can be moved within or between worksites.

Must. Mandatory.

NEMA. These initials stand for National Electrical Manufacturing Association.

NFPA. This is an acronym for National Fire Protection Association.

Nose. The portion of the stair tread that projects over the face of the riser below it.

Occupational Safety and Health Administration (OSHA). Created in 1970 when the U.S. Congress passed the Occupational Safety and Health Act, the Occupational Safety and Health Administration (OSHA) provides safety on the job for workers. OSHA oversees state plans (such as WISHA in Washington) that have elected to administer the safety and health program for their state. OSHA requires WISHA rules to be at least as effective as OSHA rules.

Office work environment. An indoor or enclosed occupied space where clerical work, administration, or business is carried out.

In addition, it includes:

- Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.
- Office areas of manufacturing and production facilities, not including process areas.
- Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

Open riser. A stair step with an air space between treads has an open riser.

Opening. A gap or void thirty inches (76 cm) or more high and eighteen inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

Organic peroxide. This is an organic compound containing the bi-valent-O-O-structure. It may be considered a structural derivative of hydrogen peroxide if one or both of the hydrogen atoms has been replaced by an organic radical.

Outlet. See definition for electrical outlets.

Oxidizer. A chemical other than a blasting agent or explosive as defined in WAC 296-52-60130 or C.F.R. 1910.109(a), that starts or promotes combustion in other materials, causing fire either of itself or through the release of oxygen or other gases.

Permissible exposure limits (PELs). Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful physical agents that must not be exceeded. PELs are specified in applicable WI-SHA rules.

Person. Based on chapter 49.17 RCW, one or more individuals, partnerships, associations, corporations, business trusts, legal representatives, or any organized group of persons.

Personal eyewash units. Personal eyewash units are portable, supplementary units that support plumbed units or self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

Personal service room. Used for activities not directly connected with a business' production or service function such as:

- First aid.
- Medical services.
- Dressing.
- Showering.
- Bathrooms.
- Washing.
- Eating.

Personnel. See the definition for employees.

Physical hazard. Means a chemical that is classified as posing one of the following hazardous effects: Explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. WAC 296-901-14024, Appendix B—Physical hazard criteria.

Platform. (~~(Platform means an extended step or landing that breaks a continuous run of stairs.)~~) A work surface elevated above the surrounding floor or ground.

Plug. See definition for attachment plug.

Potable water. Water that is suitable for drinking by the public and meets the requirements of chapter 246-290 or 246-291 WAC.

Predictable and regular basis. Employee functions such as, but not limited to, inspection, service, repair and maintenance which are performed:

- At least once every 2 weeks; or
- Four man-hours or more during any sequential 4-week period (to calculate man-hours multiply the number of employees by the number of hours during a 4-week period).

Produce. As used in Hazard communication, WAC 296-901-140, any one of the following:

- Manufacture.
- Process.
- Formulate.
- Blend.
- Extract.
- Generate.
- Emit.
- Repackage.

Purchaser. As used in Hazard communication, WAC 296-901-140, an employer who buys one or more hazardous chemicals to use in their workplace.

Pyrophoric. A chemical is pyrophoric if it will ignite spontaneously in the air when the temperature is 130°F (54.4°C) or below.

Qualified person. A person who has successfully demonstrated the ability to solve problems relating to the subject matter, work, or project, either by:

- Possession of a recognized degree, certificate, or professional standing; or
- Extensive knowledge, training and experience.

Railing or standard railing. A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

Reassume jurisdiction. The department has decided to take back its control over a citation and notice being appealed.

Receptacle or receptacle outlet. As used in basic electrical rules, WAC 296-800-280 means outlets that accept a plug to supply electric power to equipment through a cord or cable.

Record. A record is any item, collection, or grouping of information. Examples include:

- Paper document.
- Microfiche.
- Microfilm.
- X-ray film.
- Computer record.

Refuge area.

- A protected space along an exit route that is separated from other spaces inside the building by a barrier with at least a one-hour fire resistance rating; or
- A floor in a building with an automatic sprinkler system that has at least two spaces that are separated by smoke-resistant partitions. See WAC 296-24-607 for requirements for automatic sprinkler systems.

Repeat violation. A violation is a repeat violation if the employer has been cited one or more times previously for a substantially similar hazard.

Responsible party. As used in Hazard communication, WAC 296-901-140. Someone who can provide appropriate information about the hazardous chemical and emergency procedures.

Rise. The vertical distance from the top of a tread to the top of the next higher tread.

Riser. The vertical part of the step at the back of a tread that rises to the front of the tread above.

Rungs. Rungs are the cross pieces on ladders that are used to climb up and down the ladder.

Runway. (~~(An elevated walkway above the surrounding floor or ground level. Examples of runways are)~~) A passageway for persons, elevated above the surrounding floor or ground level, such as a foot-walk((s)) along shafting or a walkway((s)) between buildings.

Safety data sheet (SDS). Written, printed, or electronic information (on paper, microfiche, or on-screen) that informs manufacturers, distributors, employers or employees about a hazardous chemical, its hazards, and protective measures as required by safety data sheet and label preparation, WAC 296-901-140.

Safety factor. The term safety factor means the ratio of when something will break versus the actual working stress or safe load when it is used.

Self-lighting or self-luminous. A light source that:

- Is illuminated by a self-contained power source other than batteries; and
- Operates independently from external power sources.

Serious violation. Serious violation must be deemed to exist in a workplace if there is a substantial probability that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use in such workplace, unless the employer did not, and could not with the exercise of reasonable diligence, know of the presence of the violation.

Short-term exposure limit (STEL). An exposure limit, averaged over a short time period (usually measured for 15 minutes) that must not be exceeded during any part of an employee's workday.

Should. Should means recommended.

Single ladder. A type of portable ladder with one section.

It is distinguished by all of the following:

- It has one section.
- It cannot support itself.
- Its length cannot be adjusted.

Smoking. A person is smoking if they are:

- Lighting up.
- Inhaling.
- Exhaling.
- Carrying a pipe, cigar or cigarette of any kind that is burning.

Specific chemical identity. This term applies to chemical substances. It can mean the:

- Chemical name.
- Chemical Abstracts Service (CAS) registry number.
- Any other information that reveals the precise chemical designation of the substance.

Stair railing. A vertical barrier attached to a stairway with an open side to prevent falls. The top surface of the stair railing is used as a handrail.

Stairs or stairway. A series of steps and landings:

- Leading from one level or floor to another.
- Leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment.

- Used more or less continuously or routinely by employees, or only occasionally by specific individuals.
- With three or more risers.

Standard safeguard. Safety devices that prevent hazards by their attachment to:

- Machinery.
- Appliances.
- Tools.
- Buildings.
- Equipment.

These safeguards must be constructed of:

- Metal.
- Wood.
- Other suitable materials.

The department makes the final determination about whether a safeguard is sufficient for its use.

Step ladder. A portable ladder with:

- Flat steps.
- A hinge at the top allowing the ladder to fold out and support itself.
- Its length that cannot be adjusted.

Time weighted average (TWA₈). An exposure limit, averaged over 8 hours, that must not be exceeded during an employee's work shift.

Toeboard. A vertical barrier at floor level erected along (~~(exposed)~~) all open sides or edges of a floor opening, (~~(wall opening)~~) platform, runway, (~~(or)~~) ramp, or other walking/working surface to prevent (~~(falls of)~~) materials, tools, or debris from falling onto persons passing through or working in the area below.

Toxic chemical. As used in first aid, WAC 296-800-150, is a chemical that produces serious injury or illness when absorbed through any body surface.

Toxic substance. Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

- Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS).
- Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.
- The subject of a safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

Toxicant. A substance that has the inherent capacity to produce personal injury or illness to individuals by absorption through any body surface.

Trade secret. Any confidential:

- Formula.
- Pattern.
- Process.
- Device.
- Information.
- Collection of information.

The trade secret is used in an employer's business and gives an opportunity to gain an advantage over competitors who do not know or use it.

See WAC 296-901-14018 for requirements dealing with trade secrets.

Tread. As used in stairs and stair railings, WAC 296-800-250 means the horizontal part of the stair step.

Tread run. As used in stairs and stair railings, WAC 296-800-250 means the distance from the front of one stair tread to the front of an adjacent tread.

Tread width. The distance from front to rear of the same tread including the nose, if used.

UL (Underwriters' Laboratories, Inc.). You will find these initials on electrical cords and equipment. The initials mean the cord or equipment meets the standards set by the Underwriters' Laboratories, Inc.

Unstable (reactive). As used in Hazard communication, WAC 296-901-140. An unstable or reactive chemical is one that in its pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Use. As used in Hazard communication, WAC 296-901-140, means to:

- Package.
- Handle.
- React.
- Emit.
- Extract.
- Generate as a by-product.
- Transfer.

Vapor. The gaseous form of a substance that is normally in the solid or liquid state.

Voltage of a circuit. The greatest effective potential difference between any two conductors or between a conductor and ground.

Voltage to ground. The voltage between a conductor and the point or conductor of the grounded circuit. For undergrounded circuits, it is the greatest voltage between the conductor and any other conductor of the circuit.

Voltage, nominal. Nominal voltage is a value assigned to a circuit or system to designate its voltage class (120/240, 480Y/277, 600, etc.). The actual circuit voltage can vary from the value if it is within a range that permits the equipment to continue operating in a satisfactory manner.

WAC. This is an acronym for Washington Administrative Code, which are rules developed to address state law.

Water-reactive. As used in Hazard communication, WAC 296-901-140, a water-reactive chemical reacts with water to release a gas that is either flammable or presents a health hazard.

Watertight. Constructed so that moisture will not enter the enclosure or container.

Weatherproof. Constructed or protected so that exposure to the weather will not interfere with successful operation. Rainproof, rain-tight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

Wet location. As used in basic electrical rules, WAC 296-800-280 means:

- Underground installations or in concrete slabs or masonry that are in direct contact with the earth.
- Locations that can be saturated by water or other liquids.
- Unprotected locations exposed to the weather (like vehicle washing areas).

WISHA. This is an acronym for the Washington Industrial Safety and Health Act.

Work area. As used in Hazard communication, WAC 296-901-140, a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Worker. See the definition for employee.

Working days. Means a calendar day, except Saturdays, Sundays, and legal holidays. Legal holidays include:

- New Year's Day - January 1;
- Martin Luther King, Jr. Day;
- Presidents' Day;
- Memorial Day;
- Independence Day - July 4;
- Labor Day;
- Veterans' Day - November 11;
- Thanksgiving Day;
- The day after Thanksgiving Day; and
- Christmas Day - December 25.

The number of working days must be calculated by not counting the first working day and counting the last working day.

Workplace.

- The term workplace means:
 - Any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all workplaces covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

- As used in Hazard communication, WAC 296-901-140 means an establishment, job site, or project, at one geographical location containing one or more work areas.

You. See definition of employer.

Your representative. Your representative is the person selected to act in your behalf.

REPEALER

The following sections of the Washington Administrative Code are repealed:

- | | |
|-------------------|--|
| WAC 296-800-260 | Summary. |
| WAC 296-800-26005 | Guard or cover floor openings and floor holes. |
| WAC 296-800-26010 | Protect open-sided floors and platforms. |

WAC 296-863-099 Definitions. ANSI. The American National Standards Institute.

Authorized person (maintenance). A person who has been designated to perform maintenance on a PIT.

Authorized person (training). A person approved or assigned by the employer to perform training for powered industrial truck operators.

Approved. Listed or approved by a nationally recognized testing laboratory or a federal agency that issues approvals for equipment such as the Mine Safety and Health Administration (MSHA); the National Institute for Occupational Safety and Health (NIOSH); Department of Transportation; or U.S. Coast Guard, which issue approvals for such equipment.

Bridge plate (dock-board). A device used to span the distance between rail cars or highway vehicles and loading platforms.

Classified location or hazardous location. Areas that could be hazardous because of explosive or flammable atmospheres. These locations are broken down into the following categories:

(a) Class I locations are areas where flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(b) Class II locations are areas where the presence of combustible dust could be sufficient to produce explosions.

(c) Class III locations are areas where the presence of easily ignitable fibers are suspended in the air but are not in large enough quantities to produce ignitable mixtures.

Counterweight. A weight used to counteract or the load being carried by the truck, or to increase the load carrying capacity of a truck.

Designations. A code used to show the different types of hazardous (classified) locations where PITs can be safely used:

(a) **D** refers to trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

(b) **DS** refers to diesel powered trucks that, in addition to meeting all the requirements for type D trucks, are provided with additional safeguards to the exhaust, fuel and electrical systems.

(c) **DY** refers to diesel powered trucks that have all the safeguards of the DS trucks and, in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

(d) **E** refers to electrically powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(e) **ES** refers to electrically powered trucks that, in addition to all of the requirements for the E trucks, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

(f) **EE** refers to electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

(g) **EX** refers to electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment

are designed, constructed and assembled to be used in atmospheres containing flammable vapors or dusts.

(h) **G** refers to gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(i) **GS** refers to gasoline powered trucks that are provided with additional exhaust, fuel, and electrical systems safeguards.

(j) **LP** refers to liquefied petroleum gas-powered trucks that, in addition to meeting all the requirements for type G trucks, have minimum acceptable safeguards against inherent fire hazards.

(k) **LPS** refers to liquefied petroleum gas powered trucks that in addition to meeting the requirements for LP type trucks, have additional exhaust, fuel, and electrical systems safeguards.

Electrolyte. A chemical, usually acid, that is mixed with water to produce electricity.

Flammable liquid. Any liquid having a flashpoint at or below 199.4°F (93°C). Flammable liquids are divided into four categories as follows:

(a) Category 1 includes liquids having flashpoints below 73.4°F (23°C) and having a boiling point at or below 95°F (35°C).

(b) Category 2 includes liquids having flashpoints below 73.4°F (23°C) and having a boiling point above 95°F (35°C).

(c) Category 3 includes liquids having flashpoints at or above 73.4°F (23°C) and at or below 140°F (60°C). When a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100°F (37.8°C).

(d) Category 4 includes liquids having flashpoints above 140°F (60°C) and at or below 199.4°F (93°C). When a Category 4 flammable liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100°F (37.8°C).

(e) When liquid with a flashpoint greater than 199.4°F (93°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 4 flammable liquid.

Flashpoint. The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

(a) For a liquid which has a viscosity of less than 45 SUS at 100°F (37.8°C), does not contain suspended solids, and does not have a tendency to form a surface film while under test, the procedure specified in the Standard Method of Test for Flashpoint by Tag Closed Tester (ASTM D-56-70), WAC 296-901-14024 Appendix B—Physical hazard criteria shall be used.

(b) For a liquid which has a viscosity of 45 SUS or more at 100°F (37.8°C), or contains suspended solids, or has a tendency to form a surface film while under test, the Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester (ASTM D-93-71) or an equivalent method as defined by WAC (~~(296-91-14024)~~) 296-901-14024 Appendix B—Physical hazard criteria, shall be used, except that the methods specified in Note 1 to section 1.1 of ASTM D-93-71 may be used for the respective materials specified in the note.

(c) For a liquid that is a mixture of compounds that have different volatilities and flashpoints, its flashpoint shall be determined

by using the procedure specified in (a) or (b) of this subsection on the liquid in the form it is shipped.

(d) Organic peroxides, which undergo auto-accelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified in this section.

Front-end attachment. A device that is attached to the forks or lifting device of the truck.

Lanyard. A flexible line of webbing, rope, or cable used to secure a harness to an anchor point.

Liquefied petroleum gas. Any gas that is composed predominantly of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butane or iso-butane), and butylenes.

Listed by report. A report listing the field assembly, installation procedures, or both, for a UL listed product that does not have generally recognized installation requirements.

Load engaging. A device attached to a powered industrial truck and used to manipulate or carry a load.

Motorized hand truck. A powered truck with wheeled forks designed to go under or between pallets and is controlled by a walking or riding operator.

Nationally recognized testing laboratory. An organization recognized by the Occupational Safety and Health Administration that conducts safety tests on equipment and materials.

Order picker. A truck controlled by an operator who is stationed on a platform that moves with the load engaging means.

Powered industrial truck (PIT). A mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material.

Rough terrain forklift truck. A truck intended to be used on unimproved natural terrain and at construction sites.

Safety harness (full body harness). A configuration of connected straps that meets the requirements specified in ANSI Z359.1, that may be adjustable to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration devices.

Tie-off point (anchorage). A secure point to attach a lanyard that meets the requirements of (~~WAC 296-24-88050, Appendix C Personal fall arrest systems~~) chapter 296-880, Unified safety standards for fall protection.

Vertical load backrest extension. A device that extends vertically from the fork carriage frame.

WAC 296-870-099 Definitions.

Anemometer. An instrument for measuring wind velocity.

Angulated roping. A suspension method where the upper point of suspension is inboard from the attachments on the suspended unit, thus causing the suspended unit to bear against the face of the building.

Building face rollers. A specialized form of guide roller designed to ride on the face of the building wall to prevent the platform from abrading the face of the building and to assist in stabilizing the platform.

Building maintenance. Operations such as window cleaning, caulking, metal polishing, reglazing, and general maintenance on building surfaces.

Cable. A conductor, or group of conductors, enclosed in a weatherproof sheath, that may be used to:

- (a) Supply electrical power or control current for equipment; or
- (b) Provide voice communication circuits.

Carriage. A wheeled vehicle used for the horizontal movement and support of other equipment.

Certification. A written, signed, and dated statement confirming the performance of a requirement.

Combination cable. A cable having both steel structural members capable of supporting the platform, and copper or other electrical conductors insulated from each other and the structural members by nonconductive barriers.

Competent person. Someone who:

- (a) Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees; and
- (b) Has the authority to take prompt corrective measures to eliminate them.

Continuous pressure. Operation of a control by requiring constant manual actuation for the control to function.

Control. A system or mechanism used to regulate or guide the operation of equipment.

Davit. A device, used singly or in pairs, for suspending a powered platform from work, storage and rigging locations on the building being serviced. Unlike outriggers, a davit reacts its operating load into a single roof socket or carriage attachment.

Design factor. The ratio of the rated strength of the suspension wire rope to the rated working load. It is calculated using the following formula:

$$F = (S \times N) / W$$

Where:

F = Design factor

S = Manufacturer's rated strength of one suspension rope

N = Number of suspension ropes under load

W = Rated working load on all ropes at any point of travel.

Equivalent. Alternative design, material or method to protect against a hazard. You have to demonstrate it provides an equal or greater degree of safety for employees than the method, material or design specified in the rule.

Existing installation. A permanent powered platform installation that:

- (a) Was completed before July 23, 1990; and
- (b) Has had no major modification done after July 23, 1990.

Ground rigged davit. A davit which cannot be used to raise a suspended working platform above the building face being serviced.

Ground rigging. A method of suspending a working platform starting from a safe surface to a point of suspension above the safe surface.

Guide button. A building face anchor designed to engage a guide track mounted on a platform.

Guide roller. A rotating cylindrical member that provides continuous engagement between the suspended or supported equipment and the building guides. It may operate separately or as part of a guide assembly.

Guide shoe. A device that is similar to a guide roller but is designed to provide a sliding contact between the shoe and the building guides.

Hoisting machine. A device intended to raise and lower a suspended or supported unit.

Installation. A powered platform installation consists of all the equipment and the parts of the building involved with using the powered platform for building maintenance.

Interlock. A device designed to ensure that operations or motions occur in proper sequence.

Intermittent stabilization. A method of platform stabilization in which the angulated suspension wire ropes are secured to regularly spaced building anchors.

Lanyard. A flexible line of rope, wire rope or strap which is used to secure the body harness to a deceleration device, lifeline or anchorage.

Lifeline. A component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline). It serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Live load. The total static weight of workers, tools, parts, and supplies that the equipment is designed to support.

New installation. A permanent powered platform installation that was completed, or an existing installation that has had major modifications done, after July 23, 1990.

Operating control. A mechanism regulating or guiding the operation of equipment that makes sure the equipment operates in a specific mode.

Operating device. A push button, lever, or other manual device used to actuate a control.

Outrigger. A device, used singly or in pairs, for suspending a working platform from work, storage, and rigging locations on the building being serviced. Unlike davits, an outrigger reacts its operating moment load as at least two opposing vertical components acting into two or more distinct roof points and/or attachments.

Poured socket. A method of providing wire rope termination in which the ends of the rope are held in a tapered socket by means of poured spelter or resins.

Primary brake. A brake designed to be applied automatically whenever power to the prime mover is interrupted or discontinued.

Prime mover. The source of mechanical power for a machine.

Rated load. The manufacturer's specified maximum load.

Rated strength. The strength of wire rope, as designated by its manufacturer or vendor, based on standard testing procedures or acceptable engineering design practices.

Rated working load. The combined static weight of workers, materials, and suspended or supported equipment.

Registered professional engineer. A person who has been duly and currently registered and licensed by an authority within the United States or its territories to practice the profession of engineering.

Roof-powered platform. A powered platform having the raising and lowering mechanism located on the roof.

Roof-rigged davit. A davit used to raise the suspended working platform above the building face being serviced. This type of davit can also be used to raise a suspended working platform which has been ground rigged.

Rope. The equipment, such as wire rope, that is used to suspend a component of an equipment installation.

Safe surface. A horizontal surface that provides ((reasonable)) assurance that personnel occupying the surface will be protected from falls. This protection can be provided by ((location)) a standard guardrail system or equivalent, a personal fall protection system, or other equivalent method.

Secondary brake. A brake designed to arrest the descent of the suspended or supported equipment in the event of an overspeed condition.

Stability factor. The ratio of the stabilizing moment to the overturning moment.

Stabilizer tie. A flexible line connecting the building anchor and the suspension wire rope supporting the platform.

Supported equipment. Building maintenance equipment that is held in or moved to its working position by means of attachment directly to the building or extensions of the building being maintained.

Suspended equipment. Building maintenance equipment that is suspended and raised or lowered to its working position by means of ropes or combination cables attached to some anchorage above the equipment.

Tie-in guides. The portion of a building that provides continuous positive engagement between the building and a suspended or supported unit during its vertical travel on the face of the building.

Transportable outriggers. Outriggers designed to be moved from one work location to another.

Type F powered platform. A powered platform that has both of the following characteristics:

(a) The working platform is suspended by at least four wire ropes and designed so that failure of any one wire rope will not substantially alter the normal position of the working platform; and

(b) Only one layer of hoisting rope is permitted on the winding drums.

Type T powered platform. A powered platform installation that has a working platform suspended by at least two wire ropes. The platform will not fall to the ground if a wire rope fails, but the working platform's normal position would be upset.

Verified. Accepted by design, evaluation, or inspection by a registered professional engineer.

Weatherproof. Constructed or protected so that exposure to the weather will not interfere with successful operation.

Winding drum hoist. A type of hoisting machine that accumulates the suspension wire rope on the hoisting drum.

Working platform. The suspended or supported equipment intended to provide access to the face of the building and manned by persons engaged in building maintenance.

Wrap. One complete turn of the suspension wire rope around the surface of a hoist drum.

AMENDATORY SECTION (Amending WSR 15-23-086, filed 11/17/15, effective 12/18/15)

WAC 296-870-20005 Building owner certifications. You must obtain written certification from the building owner of any building with a powered platform installation that was completed or had major modification done after July 23, 1990, that the building and equipment meets the requirements of new installations-buildings, (~~WAC 296-870-600 and new installations-equipment, WAC 296-870-700 of this chapter~~) chapter 296-880 WAC, Unified safety standards for fall protection.

Note: The building owner needs to base the certification on:

1. The field test of the installation done before it is first placed into service or following any major modification to an existing installation;
- AND**
2. All other relevant available information, including but not limited to:
 - a. Test data;
 - b. Equipment specifications;
 - c. Verification by a registered professional engineer.

You must obtain written certification from the building owner that the installation:

(1) Has been inspected, tested, and maintained as required by inspection, testing, and maintenance, WAC 296-870-300 of this chapter; and

(2) All fall protection anchorages meet the requirements of (~~Appendix C Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24~~) WAC 296-880-40020 Personal fall arrest system requirements.

AMENDATORY SECTION (Amending WSR 15-23-086, filed 11/17/15, effective 12/18/15)

WAC 296-870-20040 Fall protection. You must protect employees on working platforms with a personal fall arrest system that meets the requirements of (~~Appendix C Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC~~) chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 17-01-119, filed 12/20/16, effective 1/20/17)

WAC 296-870-50010 Fall protection. (1) You must make sure the fall protection system of both Type F and Type T powered platforms

meet the requirements of (~~Appendix C Personal fall arrest system, WAC 296-24-88050, found in the General safety and health standards, chapter 296-24 WAC~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(2) You must make sure working platforms have permanent guardrails that meet all of the following requirements:

(a) Guardrails on the building side (front) of the platform have a top rail that is not less than (~~thirty-eight~~) thirty-nine inches and not more than forty-five inches high.

(b) Guardrails on the other three sides have a top rail that is not less than forty-five inches high.

(c) Top rails are able to withstand a force of at least two hundred pounds.

(d) Guardrails have a midrail around the entire platform between the top rail and the toeboard.

Reference: Ramps and walkways that are four feet (1.2 m) or more above a lower level need to have a guardrail system. These requirements are found in (~~Working Surfaces, Guarding Floors and Wall Openings, Ladders, Part J-1, in the General safety and health standards, chapter 296-24 WAC~~) chapter 296-880 WAC, Unified safety standards for fall protection.

AMENDATORY SECTION (Amending WSR 15-23-086, filed 11/17/15, effective 12/18/15)

WAC 296-870-60040 Guarding roofs and other elevated areas. (1)

You must make sure employees working on a roof or other elevated working area four feet (1.2 m) or more above an adjacent safe surface are protected by a perimeter guarding system.

Reference: Requirements for the perimeter guarding system are found in (~~Guarding floor and wall openings and holes, WAC 296-24-750, found in the General safety and health standards, chapter 296-24 WAC~~) chapter 296-880 WAC, Unified safety standards for fall protection.

(2) You must make sure the inboard face of the perimeter guard is:

(a) Not more than six inches (152 mm) inboard of the inside face of a barrier such as the parapet wall or roof edge curb; and

(b) Not more than eighteen inches (457 mm) from the face of the building.

(3) You must make sure an elevated track system that is designed to be traversed by carriage-supported equipment and located four feet (1.2 m) or more above an adjacent safe surface is either:

(a) Provided with a walkway and guardrail system; or

(b) Has a working platform that can be lowered, as part of normal operations, to the lower safe surface.

(4) You must make sure personnel have a safe way to access and to egress from the lower safe surface.

WAC 296-874-099 Definitions.

Adjustable suspension scaffold. A suspended scaffold equipped with one or more hoists that can be operated by employees on the scaffold.

Bearer. A horizontal scaffold member (which may be supported by ledgers or runners) upon which the scaffold platform rests and which joins scaffold uprights, posts, poles, and similar members.

Boatswain's chair. A single-point adjustable suspended scaffold consisting of a seat or sling designed to support one employee in a sitting position.

Brace. A rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Bricklayers' square scaffold. A supported scaffold composed of framed squares which support a platform.

Carpenters' bracket scaffold. A supported scaffold consisting of a platform supported by brackets attached to building or structural walls.

Catenary scaffold. A suspended scaffold consisting of a platform supported by two essentially horizontal and parallel ropes attached to structural members of a building or other structure. Additional support may be provided by vertical pickups.

Cleat. A structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats are also used to provide footing on sloped surfaces such as access ramps.

Competent person. Someone who:

(a) Is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees; and

(b) Has the authority to take prompt corrective measures to eliminate them.

Coupler. A device for locking together the tubes of a tube and coupler scaffold.

Double-pole (independent pole) scaffold. A supported scaffold consisting of one or more platforms resting on cross beams (bearers) supported by ledgers and a double row of uprights independent of support (except ties, guys, braces) from any structure.

Equivalent. Alternative design, material, or method to protect against a hazard. You have to demonstrate that it provides an equal or greater degree of safety for employees than the method, material, or design specified in the rule.

Exposed power lines. Electrical power lines which are accessible to and may be contacted by employees. Such lines do not include extension cords or power tool cords.

Eye or eye splice. A loop at the end of a wire rope.

Fabricated frame scaffold (tubular welded frame scaffold). A scaffold consisting of platforms supported on fabricated frames with integral posts, horizontal bearers, and intermediate members.

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

Float (ship) scaffold. A suspended scaffold consisting of a braced platform resting on two parallel bearers and hung from overhead supports by ropes of fixed length.

Form scaffold. A supported scaffold consisting of a platform supported by brackets attached to formwork.

Guardrail system. A vertical barrier consisting of, but not limited to, toprails, midrails, and posts, erected to prevent employees from falling off a scaffold platform or walkway.

Handrails (ladder stands). A rail connected to a ladder stand running parallel to the slope and/or top step.

Hoist. A manual or power-operated mechanical device to raise or lower a suspended scaffold.

Horse scaffold. A supported scaffold consisting of a platform supported by construction horses (saw horses). Horse scaffolds constructed of metal are sometimes known as trestle scaffolds.

Independent pole scaffold. (See double-pole scaffold.)

Interior hung scaffold. A suspended scaffold consisting of a platform suspended from the ceiling or roof structure by fixed length supports.

Ladder jack scaffold. A supported scaffold consisting of a platform resting on brackets attached to ladders.

Ladder stand. A mobile, fixed-size, self-supporting ladder consisting of a wide flat tread ladder in the form of stairs.

Landing. A platform at the end of a flight of stairs.

Large area scaffold. A pole scaffold, tube and coupler scaffold, system scaffold, or fabricated frame scaffold erected over substantially the entire work area. For example: A scaffold erected over the entire floor area of a room.

Lean-to scaffold. A supported scaffold which is kept erect by tilting it toward and resting it against a building or structure.

Ledger. (See runner.)

~~((**Lifeline.** A component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline). It serves as a means for connecting other components of a personal fall arrest system to the anchorage.))~~

Lower levels. Areas below the level where the employee is located and to which an employee can fall. Such areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

Masons' adjustable supported scaffold. (See self-contained adjustable scaffold.)

Masons' multipoint adjustable suspension scaffold. A continuous run suspended scaffold designed and used for masonry operations.

Maximum intended load. The total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.

Midrail. A rail, approximately midway between the toprail of a guardrail system and the platform, and secured to the uprights erected along the exposed sides and ends of a platform.

Mobile scaffold. Supported scaffold mounted on casters or wheels.

Multilevel suspended scaffold. A two-point or multipoint adjustable suspension scaffold with a series of platforms at various levels resting on common stirrups.

Multipoint adjustable suspension scaffold. A suspended scaffold consisting of a platform(s) which is suspended by more than two ropes

from overhead supports and equipped with means to raise and lower the platform to desired work levels.

Needle beam scaffold. A suspended scaffold which has a platform supported by two bearers (needle beams) suspended from overhead supports.

Outrigger. A structural member of a supported scaffold which increases the base width of a scaffold. This provides support for and increases the stability of the scaffold.

Outrigger beam (suspended and supported). The structural member of a suspended scaffold or outrigger scaffold which provides support for the scaffold by extending the scaffold point of attachment to a point out and away from the structure or building.

Outrigger scaffold. A supported scaffold consisting of a platform resting on outrigger beams which projects beyond the wall or face of the building or structure. The inboard ends of the outrigger beams are secured inside the building or structure.

Overhand bricklaying. The process of laying bricks and masonry so that the surface of the wall is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. It includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.

~~(Personal fall arrest system. A system used to arrest an employee's fall. It consists of an anchorage, connectors, and body harness and may also include a lanyard, deceleration device, lifeline, or combinations of these.)~~

Platform. A work surface used in scaffolds, elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Pole scaffold. (See single-pole scaffold and double (independent) pole scaffold.)

Pump jack scaffold. A supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

Qualified person. A person who has successfully demonstrated the ability to solve problems relating to the subject matter, work, or project, either by:

(a) Possession of a recognized degree, certificate, or professional standing; or

(b) Extensive knowledge, training and experience.

Rated load. The manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

Repair bracket scaffold. A supported scaffold consisting of a platform supported by brackets. The brackets are secured in place around the circumference or perimeter of a chimney, stack, tank, or other supporting structure by one or more wire ropes placed around the supporting structure.

Roof bracket scaffold. A supported scaffold used on a sloped roof. It consists of a platform resting on angular-shaped supports so that the scaffold platform is level.

Runner (ledger). The lengthwise horizontal spacing or bracing member which may support the bearers.

Scaffold. A temporary elevated platform, including its supporting structure and anchorage points, used for supporting employees or materials.

Self-contained adjustable scaffold. A combination supported and suspended scaffold consisting of an adjustable platform mounted on an independent supporting frame, not a part of the object being worked on, which is equipped with a means to raise and lower the platform.

Such systems include rolling roof rigs, rolling outrigger systems, and some masons' adjustable supported scaffolds.

Shore scaffold. A supported scaffold which is placed against a building or structure and held in place with props.

Single-point adjustable suspension scaffold. A suspended scaffold consisting of a platform suspended by one rope from an overhead support and equipped with means to permit the movement of the platform to desired work levels.

Single-pole scaffold a supported scaffold. Consisting of platforms resting on bearers, the outside ends of which are supported on runners secured to a single row of posts or uprights, and the inner ends of which are supported on or in a structure or building wall.

Stair tower (scaffold stairway/tower). A tower comprised of scaffold components which contains internal stairway units and rest platforms. These towers are used to provide access to scaffold platforms and other elevated points such as floors and roofs.

Stall load. The load at which the prime mover of a power-operated hoist stalls or the power to the prime mover is automatically disconnected.

Step, platform, and trestle ladder scaffold. A platform resting directly on the rungs of a step, platform, or trestle ladder.

Stilts. A pair of poles or similar supports with raised footrests, used to permit walking above the ground or working surface.

Stonesetters' multipoint adjustable suspension scaffold. A continuous run suspended scaffold designed and used for stonesetters' operations.

Supported scaffold. One or more platforms supported by rigid means such as outrigger beams, brackets, poles, legs, uprights, posts, or frames.

Suspended scaffold. One or more platforms suspended from an overhead structure by ropes or other nonrigid means.

System scaffold. A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.

Toeboard (scaffold). A barrier erected along the exposed sides and ends of a scaffold platform at platform level to prevent material, tools, and other loose objects from falling from the platform.

Top plate bracket scaffold. A scaffold supported by brackets that hook over or are attached to the top of a wall. This type of scaffold is similar to carpenters' bracket scaffolds and form scaffolds.

Tube and coupler scaffold. A scaffold consisting of platforms supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

Tubular welded frame scaffold. (See fabricated frame scaffold.)

Tubular welded sectional folding scaffold. A sectional, folding metal scaffold either of ladder frame or inside stairway design. It is substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces. It can be folded into a flat package when the scaffold is not in use.

Two-point suspension scaffold (swing stage). A suspended scaffold consisting of a platform supported by hangers (stirrups), suspended by two ropes from overhead supports, and equipped with a means to permit the raising and lowering of the platform to desired work levels.

Unstable objects. Items whose strength, configuration, or lack of stability may allow them to become dislocated and shift and therefore may not properly support the loads imposed on them. Unstable objects

do not constitute a safe base support for scaffolds, platforms, or employees. Examples include, but are not limited to, barrels, boxes, loose brick, and concrete blocks.

Vertical pickup. A rope used to support the horizontal rope in a catenary scaffold.

Walkway (scaffold). Part of a scaffold used only for access and not as a working level.

Window jack scaffold. A platform resting on a bracket or jack that projects through a window opening.

Work level. The elevated platform, used for supporting workers and their materials.

AMENDATORY SECTION (Amending WSR 15-23-086, filed 11/17/15, effective 12/18/15)

WAC 296-874-20052 Provide fall protection for employees on scaffolds. (~~((1) You must protect each employee on a scaffold more than ten feet (3.1 m) above a lower level, from falling to the lower level, by providing either:~~

~~(a) A personal fall arrest system; or~~

~~(b) Guardrails.~~

REFERENCE		
Fall protection requirements for employees:	Are located in the following chapters:	In the following sections:
On walkways within scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-20056
Erecting or dismantling supported scaffolds	Chapter 296-874 WAC, Scaffolds	WAC 296-874-40010
Erecting or dismantling suspended scaffolds in general industry	Chapter 296-24 WAC, General safety and health standards	Part J-1 Working surfaces, guarding floors and wall openings, ladders and Part J-3 Powered platforms
Erecting or dismantling suspended scaffolds in construction work	Chapter 296-155 WAC, Safety standards for construction work	Part C-1 Fall protection requirements for construction

~~(2) You must make sure employees erecting the scaffold install the guardrail system, if required, before the scaffold is used by any other employees.) See requirements in chapter 296-880 WAC, Unified safety standards for fall protection.~~

REPEALER

The following sections of the Washington Administrative Code are repealed:

- WAC 296-874-20054 Provide fall protection if a scaffold is too far from the work face.
- WAC 296-874-20056 Provide specific fall protection for specific types of scaffolds.
- WAC 296-874-20058 Make sure personal fall arrest systems meet these requirements.
- WAC 296-874-20060 Make sure vertical lifelines used with personal fall arrest systems meet these requirements.
- WAC 296-874-20062 Make sure horizontal lifelines used with personal fall arrest systems meet these requirements.
- WAC 296-874-20064 Make sure guardrail systems meet these requirements.
- WAC 296-874-40010 Provide fall protection for persons erecting or dismantling supported scaffolds.

AMENDATORY SECTION (Amending WSR 14-09-095, filed 4/22/14, effective 7/1/14)

WAC 296-878-15025 Use fall protection equipment. (1) You must make sure the fall arrest system meets the requirements of ((WAC 296-24-88050 mandatory Appendix C, Part I, Personal fall arrest systems)) chapter 296-880 WAC, Unified safety standards for fall protection.

(2) You must use and inspect fall arrest equipment in accordance with the requirements of ((WAC 296-24-88050, mandatory Appendix C, Part I, Personal fall arrest systems.

~~(3) You must make sure all workers suspended from a boatswain's chair or rope descent system use an independent fall arrest system where the fall arrest anchorage is separate from the suspension system anchorage))~~ chapter 296-880 WAC, Unified safety standards for fall protection.

((~~(4)~~)) (3) You must make sure workers operating powered platforms wear and use a fall arrest system.

((~~(5)~~)) ~~You must make sure workers assemble and wear their personal fall arrest equipment before they approach the point of suspension.~~

~~(6) You must make sure workers are connected at all times to the fall arrest system while they are suspended.~~

~~(7))~~ (4) You must make sure the boatswain's chair or rope descent system is connected at all times to the suspension line.

REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 296-878-21005 Prohibit equipment from use.