

**WAC 296-155-77105 Material hoists, personnel hoists, and elevators. (1) General requirements.**

(a) The employer must comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where the manufacturer's specifications are not available, the limitations assigned to the equipment must be based on the determinations of a professional engineer competent in the field.

(b) The employer must ensure that no person must enter a hoistway, elevator shaft, or similar enclosure in which the hoisting apparatus or vehicle is installed and functioning unless the power source operating those systems is locked out in accordance with WAC 296-155-429.

(c) Rated load capacities, recommended operating speeds, and special hazard warning or instructions must be posted on cars and platforms.

(d) Wire rope must be removed from service when any of the following conditions exists:

(i) In hoisting ropes, 6 randomly distributed broken wires in one rope lay or 3 broken wires in one strand in one rope lay;

(ii) Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;

(iii) Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;

(iv) Reduction from nominal diameter of more than 3/64 inch for diameters up to and including 3/4 inch; 1/16 inch for diameters 7/8 to 1 1/8 inches; and 3/32 inch for diameters 1 1/4 to 1 1/2 inch.

(e) Hoisting ropes must be installed in accordance with the wire rope manufacturer's recommendations.

(f) The installation of live booms on hoists is prohibited.

(g) The use of endless belt-type man lifts on construction must be prohibited.

(h) Employees must not be permitted to ride on top of material hoists, personnel hoists or permanent elevators except for purposes of inspection, maintenance, elevator installation or dismantling work.

**(2) Material hoists.**

(a) (i) Operating rules must be established and posted at the operator's station of the hoist. Such rules must include signal system and allowable line speed for various loads. Rules and notices must be posted on the car frame or crosshead in a conspicuous location, including the statement "No riders allowed."

(ii) No person must be allowed to ride on material hoists except for the purposes of inspection and maintenance.

(b) All entrances of the hoistways must be protected by substantial gates or bars which must guard the full width of the landing entrance. All hoistway entrance bars and gates must be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars must be not less than 2- by 4-inch wooden bars or the equivalent, located two feet from the hoistway line. Bars must be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistway must be equipped with a latching device.

(c) Overhead protective covering of two-inch planking, 3/4 inch plywood or other solid material of equivalent strength must be provided on the top of every material hoist cage or platform to prevent objects falling on the workers loading or unloading the hoist.

(i) The protective covering on the top of the cage or platform may be made in hinged sections that may be raised when hoisting long material.

(ii) When using a cage or platform for long material, the several pieces of the material must be securely fastened together and made fast to the cage or platform, so that no part of the load can fall or project beyond the sides of the cage or platform.

(d) The operator's station of a hoisting machine must be provided with overhead protection equivalent to tight planking not less than two inches thick. The support for the overhead protection must be of equal strength.

(e) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions must be met:

(i) When a hoist tower is enclosed, it must be enclosed on all sides for its entire height with a screen enclosure of 1/2 inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car must be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with one-half inch mesh No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure must include the required gates for loading and unloading. A 6-foot high enclosure must be provided on the unused sides of the hoist tower at ground level.

(f) Car arresting devices must be installed to function in case of rope failure.

(g) All material hoist towers must be designed by a licensed professional engineer.

(h) All material hoists must conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

### (3) **Personnel hoists.**

(a) Personnel hoists must be provided for access and egress on all multistory buildings where vertical travel exceeds 60 feet from a ground level access point.

(b) Hoist towers outside the structure must be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure must be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms must be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(c) Towers inside of structures must be enclosed on all 4 sides throughout the full height.

(d) Towers must be anchored to the structure at intervals not exceeding 30 feet. In addition to tie-ins, a series of guys must be installed. Where tie-ins are not practical the tower must be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorages to ensure stability.

(e) Hoistway doors or gates must be not less than 6 feet 6 inches high and must be provided with mechanical locks which cannot be operated from the landing side, and must be accessible only to persons on the car.

(f) Cars must be permanently enclosed on all sides and the top, except sides used for entrance and exit, which have car gates or doors.

(g) A door or gate must be provided at each entrance to the car which must protect the full width and height of the car entrance opening.

(h) Overhead protective covering of two inch planking, 3/4 inch plywood or other solid material of equivalent strength must be provided on the top of every personnel hoist.

(i) Doors or gates must be provided with electric contacts which do not allow movement of the hoist when door or gate is opened.

(j) A signal device must be installed in the elevator car and only operated by an attendant who must give the signals for operation, when transporting workers.

(k) An electrical push button signaling device or other approved signaling system must be provided at each floor landing connected to an annunciator in the car. The signal code must be posted adjacent to the signal device at each and every work level and at operator's work level. All wording must be black on a white card, in large clear letters.

(l) The elevator machine and controls must be housed in as a protection against accidents and the weather, and the door kept locked against unauthorized entrance when operator is not in attendance.

(m) Safeties must be capable of stopping and holding the car and rated load when traveling at governor tripping speed.

(n) You must provide cars with a capacity and data plate secured in a conspicuous place on the car or crosshead.

(o) You must not permit internal combustion engines for direct drive.

(p) You must provide normal and final terminal stopping devices.

(q) You must provide an emergency stop switch in the car and marked "stop."

(r) Ropes:

(i) The minimum number of hoisting ropes used must be 3 for traction hoists and two for drum-type hoists.

(ii) The minimum diameter of hoisting and counterweight wire ropes must be 1/2 inch.

(iii) Safety factors:

**Minimum Factors of Safety for Suspension Wire Ropes**

<b>Rope speed in feet per minute:</b>	<b>Minimum factor of safety:</b>
50	7.60
75	7.75
100	7.95
125	8.10
150	8.25
175	8.40
200	8.60
225	8.75
250	8.90
300	9.20
350	9.50
400	9.75
450	10.00
500	10.25

Rope speed in feet per minute:	Minimum factor of safety:
550	10.45
600	10.70

(s) Following assembly and erection of hoists, and before being put in service, you must perform an inspection and test of all functions and safety devices under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. You must inspect and test hoists at not more than 3 month intervals. You must maintain and keep records on file for the duration of the job.

(t) All personnel hoists used by employees must be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this subdivision do not apply to cantilever type personnel hoists.

(u) You must take wire rope out of service when any of the following conditions exist:

(i) In running ropes, 6 randomly distributed broken wires in one lay or 3 broken wires in one strand in one lay;

(ii) Wear of 1/3 the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than 3/64 inch for diameters to and including 3/4 inch, 1/16 inch for diameter 7/8 inch to 1 1/8 inches inclusive; 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(A) Personnel hoists used in bridge tower construction must be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(B) When a hoist tower is not enclosed, the hoist platform or car must be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4 inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure must include the required gates for loading and unloading.

(C) You must inspect and maintain these hoists on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour you must inspect it and put it in operable condition before reuse.

(4) You must install and maintain all elevators, manlifts, or other lifting devices in conformity with the requirements specified in the Washington state elevator laws and regulations adopted by the elevator section of the department of labor and industries.

**Note:** For additional information refer to chapter 296-96 WAC, Safety regulations and fees for all elevators, dumbwaiters, escalators and other conveyances.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-77105, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.440, 49.17.060, and 29 C.F.R. 1926, Subpart CC. WSR 12-01-086, § 296-155-77105, filed 12/20/11, effective 2/1/12.]