

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

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PROPOSED STATE STANDARD,  
TITLE 8, DIVISION 1, CHAPTER 4

Subchapter 20. Tunnel Safety Orders  
Article 19. Shafts and Hoisting Systems

§8495. Hoisting Equipment and Systems.

(a) General Requirements.

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(11) A non-combustible hoist house shall be constructed and wherever possible, provide a clear and unobstructed view of the shaft collar. Physical protection shall be provided for the hoistman, hoist drum(s), braking system and drive motors.

(A) A fire extinguisher that is rated at least 2A:10B:C (multi-purpose, dry chemical) shall be mounted in each hoist house.

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(b) Personnel Hoisting Systems.

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(2) Hoists shall be equipped with limit switches to prevent over travel at the top and bottom of the hoistway.

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(5) Personnel hoists shall be equipped with at least two brakes, ~~either~~ each of which is capable of stopping and holding 150 percent of the hoist's rated line pull. At least One shall be an automatic brake that will be applied whenever the power fails, is shut off or when the power control lever is in the "off" position. The other brake shall be a hand or foot brake that operates on the hoist drum. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this section.

(c) Shaft Conveyances.

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(4) Conveyances used for the movement of personnel shall be provided with sheet iron or steel side-casings not less than six feet in height and not less than 14 gauge ~~one-sixteenth inch~~ thick or with one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) ~~netting composed of wire not less than one-sixteenth inch in diameter (the maximum size of openings of wire netting shall not be greater than one inch)~~, and with gates of not less than four and one-half feet in height and made of such materials as specified for side-casing, either hung on hinges or working in slides; provided, however, that this safety order does not preclude the use of other materials having equivalent strength and providing equal safety. The conveyance shall have handholds provided so that each person will have a convenient means for steadying themselves.

(A) All personnel conveyances shall be provided with a positive locking door and/or gate that does not open outward.

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NOTE: Authority cited: Sections 142.3 and 7997, Labor Code. Reference: Sections 142.3 and 7997, Labor Code.

§8496. Shafts and Raises Under Construction.

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(c) In areas of shaft construction where buckets or cages without guides are used for handling personnel and material, the arrangements must be such that:

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(3) The travel speed shall not exceed 200 feet per minute. Where practicable, governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

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NOTE: Authority cited: Sections 142.3 and 7997, Labor Code. Reference: Sections 142.3 and 7997, Labor Code.

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§8497. Wire Rope and Sheaves.

(a) Factor of Safety. All rope to be used for regular hoisting shall be wire rope providing a factor of safety not less than five to one for material hoist and ten to one for personnel hoist when new, which shall be calculated by dividing the breaking strength of the wire rope as given in the manufacturer's published tables, by the total load to be hoisted including the total weight of the wire rope in the shaft when fully let out, plus a proper allowance for impact and acceleration.

The acceleration allowance shall be in accordance with manufacturer's recommendations, but in all cases the factor of safety of five or more must be maintained when the load, used in determining it, is greater than the actual weight by a percentage that is numerically three times the acceleration or deceleration, whichever is greatest. For example, a deceleration or acceleration of two feet per second that increases the load would require use of an effective load 6 percent greater than the actual weight, in the calculation of a factor of safety.

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NOTE: Authority cited: Sections 142.3 and 7997, Labor Code. Reference: Sections 142.3 and 7997, Labor Code.

§8500. Hoisting Operations.

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(p) Personnel and materials or equipment, other than small tools and supplies secured in a manner that will not create a hazard to employees, shall not be hoisted together in the same conveyance. However, if the cage operator is protected from shifting of materials and equipment, then the cage operator may ride with material or equipment in cages or skips which are designed to be controlled by an operator within the cage or skip.

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(t) General requirements for cranes and hoists.

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(1) Materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, shall be secured or stacked in a manner to prevent the load from shifting, snagging or falling into the shaft.

(2) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances shall flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This section does not apply to fully enclosed hoistways.

NOTE: Authority cited: Sections 142.3 and 7997, Labor Code. Reference: Sections 142.3 and 7997, Labor Code.