§1604.8 Electrical Wiring, Fittings, and Fixtures

(a) Wiring, Raceways, and Cables in Hoistways and Machine Rooms.

Main feeders for supplying power to the hoist may be installed inside or outside the hoistway.

(1) *Only such electrical wiring,* raceways, and cables used directly in connection with the hoist may be installed inside the hoistway.

(A) *All conduits,* armored cables, electrical metallic tubing, metal wireways, flexible conduits, and cabled conductors located within hoistways shall be securely fastened to the hoistway construction or to the guide member(s), or to the guide member supports.

(2) *The installation* of all electrical wiring in hoistways and machine rooms, except as may be provided elsewhere in this Standard, shall conform to the requirements of the Electrical Safety Orders.

Traveling cables, where used between the car and hoistway wiring, shall be Type E.O., E.T.T., S.O., or a type approved by an accepted testing laboratory.

(b) Enclosure of Live Parts on Cars and in Hoistway.

All live parts of electrical apparatus, located in or on hoist cars or in their hoistways, shall be suitably enclosed to protect against accidental contact.

The maximum circuit voltage of control or operating circuits permitted in or on hoist cars and their hoistways shall not exceed that specified in Section 1604.24(c)(1).

(c) Fittings, Fixtures, and Switches.

Where the hoistway is exposed to the weather, as in open shafts outside the structure; the electrical wiring, fittings, fixtures, and switches shall be weatherproof.

Slack rope switches, where required, lower normal-terminal and lower final-terminal hoistway limit switches, slowdown switches, and pit stop switches shall be located as far above the bottom of the pit as practicable.

§1604.9 Protection of, and Access to, Machinery and Control Equipment, and Lighting of Machinery Spaces

(a) Access shall be provided to the machinery and control spaces to permit proper lubrication and maintenance of the equipment.

(b) Machinery and control equipment shall be protected from the weather and from access by unauthorized persons.

(c) Spaces containing driving machines and control equipment shall be provided with adequate lighting.

§1604.10 Bottom and Top Clearances and Runbys for Cars and Counterweights

(a) Bottom Car Clearances.

When the car rests on its fully compressed buffer, there shall be a vertical clearance of not less than 2 feet between the pit area (ground or foundation) and the lowest structural or mechanical part, equipment, or device installed beneath the car platform except guide shoes or rollers, safety-jaw assemblies, and platform aprons, guards, or other equipment located within 12 inches horizontally from the sides of the car platform (See Figure 1).

When the car rests on its fully compressed buffer, no part of the car or any equipment attached thereto shall strike any part of the pit or any part of the equipment located therein.

(1) *The bottom clearance* should be determined as shown in Figure 1 and should be not less than the following:

(A) *Where no equipment* under the car platform, except as noted in Figure 1, projects below the bottom of the car frame plank channel, c = 2'0".

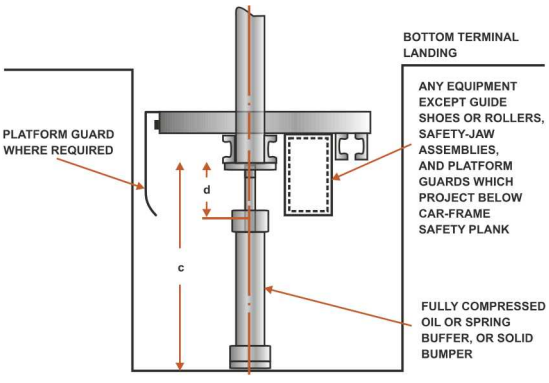

FIGURE 1
Bottom Car Clearance

(B) *Where any equipment* under the car platform, except as noted in Figure 1, projects a distance, d, below the bottom of the car frame plank channel, c = d + 2'0".

(b) Bottom Runby for Counterweighted Hoists.

The bottom runby of cars and counterweights shall be not less than 6 inches.

EXCEPTION: Where spring return-type oil buffers are used, the runby may be eliminated so that the buffers are compressed by not more than 25% of their stroke when the car floor is level with the terminal landings.

(1) *Where spring buffers are used,* a minimum of 6 inches shall be required where generator field control is used; where rheostatic control is used, not less than the following minimum runbys shall apply:

Rated Speed (feet per minute)	Runby (inches)
51 to 200	9
201 to 600	12

(c) Bottom Runby for Uncounterweighted Hoists.

The bottom runby of uncounterweighted elevators shall be not less than 6 inches.

(d) Maximum Bottom Runby for Permanent Elevators Used as Hoists.

(1) *Twenty-four inches for cars.*

(2) *Thirty-six inches for counterweights.*

(e) Top Car Clearances for Counterweighted Hoists.

The top car clearance shall be not less than the sum of the following:

(1) *The bottom counterweight runby.*

(2) *The stroke of the counterweight buffer used.*

(3) *Two feet or the distance* which any sheave or any other equipment mounted in or on the car crosshead projects above the top of the car crosshead, whichever is greater.

(4) *Where an oil buffer is used* for the counterweight and no provision is made to prevent the jump of the car at counterweight buffer engagement, add one-half the gravity stopping distance based on 115% of rated speed, or one-half the counterweight buffer stroke if a reduced stroke buffer conforming to Section 1604.14(c) is used. Where counterweight spring buffers are used, add one-half the gravity stopping distance based on governor-tripping speed.

(f) Top Car Clearance for Uncounterweighted Hoists.

The top car clearance shall be not less than 2 feet 6 inches.

(g) Top Counterweight Clearances.

The top counterweight clearance shall be not less than the sum of the following:

(1) *The bottom car runby.*

(2) *The stroke of the car buffer used.*

(3) *Six inches.*

(4) *Where an oil buffer* is used for the car and no provision is made to prevent the jump of the counterweight at car buffer engagement, add one-half the gravity stopping distance based on 115% of rated speed, or one-half the car buffer stroke if a reduced stroke buffer conforming to Section 1604.14(c) is used.

Where car spring buffers are used, add one-half the gravity stopping distance based on governor-tripping speed.

(h) Overhead Clearances Where Overhead Beams Are Not Over Car Crosshead.

Where overhead beams or other overhead hoistway construction except sheaves are located vertically over the car, but not over the crosshead, the clearance from the car top to such beams or construction, when the car is level with the top landing, shall be not less than the amount specified in Sections 1604.10(e) and 1604.10(f).

(i) Equipment on Top of Car Striking Overhead Structure.

When the car crosshead, or car top where no crosshead is provided, is at a distance of 2 feet from the nearest obstruction above it, no equipment on top of the car shall strike any part of the overhead structure or the equipment located in the hoistway.

(j) Gravity Stopping Distances.

The following formula gives the value of the stopping distance based on gravity retardation from any initial velocity:

$$S = \frac{(V)^2}{19{,}320}$$

where:

V = initial velocity, in feet per minute

S = free fall, in inches (gravity stopping distance)