# Chapter Ind 4

# ELEVATOR CODE



**History:** Chapter Ind 4 as it existed on October 31, 1964 was repealed and a new chapter Ind 4 was created effective November 1, 1964.

**Ind 4.001 Definitions.** (1) ANNUNCIATOR, ELEVATOR CAR. An electrical device in the car which indicates visually the landing at which an elevator landing signal registering device has been actuated.

(2) APPROVED. Means approved by the industrial commission.

(3) BASEMENT. A story, the floor line of which is below the grade at any entrance or exit, and the ceiling of which is not more than 5 feet above such grade at any exit or entrance. The number of stories of a building includes all stories except the basement.

(4) BUFFER. A device designed to absorb the impact of the car or counterweight at the extreme lower limits of travel.

(5) CAPACITY. See Contract Load, or Rated Load.

(6) CAR, ELEVATOR. An elevator car is the load carrying unit including the platform, car frame, and enclosure.

(7) CAR DOOR OR GATE. A door or gate in or on the elevator car ordinarily used for entrance and exit.

(8) CAR GATE, COLLAPSING. A collapsing gate is one that is distorted in opening and closing.

(9) CAR DOOR OR GATE ELECTRIC CONTACT. An electrical device, the function of which is to prevent operation of the driving machine by the normal operating device unless the car door or gate is in the closed position.

(10) CAR ENCLOSURE. The enclosure or cab of an elevator is the enclosure consisting of walls and the top or cover built up on the platform.

(11) CAR FRAME (SLING). The supporting frame to which the car platform, upper and lower sets of guide shoes, car safety and the hoisting ropes or hoisting-rope sheaves, or the plunger of a direct plunger elevator are attached.

(a) *Car frame, overslung.* A frame to which the hoisting-rope fastenings or hoisting-rope sheaves are attached to the crosshead or top member of the car frame.

(b) *Car frame, underslung.* A frame to which the hoisting-rope fastenings or hoisting-rope sheaves are attached at or below the car frame.

(c) *Car frame, sub-post.* A frame all of whose members are located below the car platform.

(12) CAR PLATFORM. A structure which forms the floor of the car and which directly supports the load.

(13) CLEARANCE, BOTTOM CAR. The clear vertical distance from the pit floor to 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 or guards, when the car rests on its fully compressed buffers. (See *BOTTOM OVERTRAVEL.*)

(14) CLEARANCE, TOP CAR. Top clearance of the elevator car is the shortest vertical distance between the lowest part of the overhead structure or any other overhead obstruction, directly above the car and the uppermost point of the elevator car and its appurtenances

except, guide shoes, leveling devices, car gate posts and car door or gate opening and closing linkage.

**Note:** The intent is to restrict any further exceptions other than noted above. For overhead height see section Ind 4.001 (59).

(a) *Clearance, top counterweight.* The top counterweight clearance of every powered elevator is the vertical distance from the top uppermost part of the counterweight structure, except guide shoes, to the lowest point of the overhead structure or any other overhead obstruction, directly above the counterweight in the elevator's related hoistway when the car is resting on its buffers at their extreme mechanical down limit of travel.

(15) RUNBY. BOTTOM. Of an elevator car is the distance the car floor can travel below the level of the lower terminal landing until the car strikes its buffer.

(a) Bottom runby of an elevator counterweight is the distance the counterweight can travel below its position when the car floor is level with the upper terminal landing until the counterweight strikes its buffer.

(16) TOP. OVERTRAVEL. Of a traction elevator is the distance the car platform can travel above the level of the upper terminal landing until the counterweight buffer is fully compressed.

(a) Top overtravel of an oil hydraulic elevator car is the distance provided for the car floor to travel above the level of the upper terminal landing until the car is stopped by the normal terminal stopping device.

(b) Top overtravel of the counterweight is the distance the counterweight can travel above its position when the car platform is level with the bottom terminal landing until the car buffer is fully compressed.

(17) COMPENSATING-ROPE SHEAVE SWITCH. A device which automatically causes the electric power to be removed from the elevator driving-machine motor and brake when the compensating sheave approaches its upper or lower limit of travel.

(18) CONTRACT LOAD, OR RATED LOAD, (CAPACITY). The approved safe live load specified in application and plans submitted for approval.

(19) RATED SPEED. The speed at which the elevator, power dumbwaiter, escalator or moving walk or moving ramp is designed to operate under the following conditions.

(a) *Elevator or power dumbwaiter.* The speed in the "up" direction with the rated load in the car.

(b) *Escalators, moving ramp.* The rate of travel of the steps, carriage or treadway, measured along the angle of inclination, with the rated load, on the steps, carriage or treadway. In case of a reversible escalator or moving ramp, the rated speed shall be the rate of travel of the steps or treadway in the "up" direction, measured along the angle of inclination, with the rated load on the steps or treadway.

(c) *Moving walk.* The rate of travel of the treadway measured along the line of travel or angle of inclination with the rated load on the treadway.

(20) CONTROL. The system governing the starting, direction of motion, stopping, acceleration, speed and retardation of the moving member.

(a) *Generator-field control.* A system of control which is accomplished by the use of an individual generator for each elevator or dumbwaiter wherein the voltage applied to the driving-machine motor is adjusted by varying the strength and direction of the generator field.

(b) *Multi-voltage control.* A system of control which is accomplished by impressing successively on the armature of the driving-machine motor a number of substantially fixed voltages such as may be obtained from multi-commutator generators common to a group of elevators.

(c) *Rheostatic control.* A system of control which is accomplished by varying resistance and/or reactance in the armature and/or field circuit of the driving-machine motor.

(d) *Two-speed alternating current control.* A 2-speed driving-machine induction motor which is arranged to run at 2 different synchronous speeds by connecting the motor windings so as to obtain a different number of poles.

(21) CABLE LOCK. A device installed and maintained so that the operating cable can be locked at any landing.

(22) CENTERING ROPE. Used in connection with hand cable control which, when pulled, will throw the operating device to the stop position.

(23) DOOR OR GATE DEVICE, POWER OPERATED. A device or assemblage of devices, the purpose of which is to open and/or close the hoistway door and/or car door or gate by power other than by hand, gravity, springs, or the movement of the car.

(a) *Doors.* See Hoistway Door or Gate, this section (Definition 37).

(24) DUMBWAITER. A hoisting and lowering mechanism, equipped with a car, which moves in guides in a substantially vertical direction, the floor area of which does not exceed 9 square feet, whose internal compartment height does not exceed 4 feet, the capacity of which does not exceed 500 pounds, and which is used exclusively for carrying freight.

(25) ELEVATOR. "A hoisting and lowering mechanism equipped with a car or platform which moves in guides in a substantially vertical direction and which serves two or more landings of a building or structure."

(a) *Passenger elevator.* An elevator used primarily to carry persons.

(b) *Freight elevator.* An elevator used for carrying freight and on which only the attendant and/or the persons necessary for loading and unloading are permitted to ride.

(c) *Hand elevator.* An elevator utilizing manual energy to move the car.

(d) *Gravity elevator.* An elevator utilizing gravity to move the car.

(e) *Electric elevator.* A power elevator where the energy is applied by means of an electric motor.

(f) *Electro-hydraulic elevator.* A direct-plunger elevator where liquid is pumped under pressure directly into the cylinder by a pump driven by an electric motor.

(g) *Carriage elevator.* An elevator which is supported by cables attached to the platform at four or more points in such a manner that the supporting cables are relied upon to maintain the platform substantially level.

(h) *Sidewalk elevators.* A freight elevator, the hoistway being located partially outside the building and having no opening into the building at the upper terminal landing.

(j) *Hydraulic elevator.* A power elevator where the energy is applied, by means of a liquid under pressure, in a cylinder equipped with a plunger or piston.

(k) *Direct-plunger elevator.* A hydraulic elevator having a plunger or piston directly attached to the car frame or platform.

(m) *Grade level elevators.* A freight elevator, the hoistway being located partially outside the building located in an area not used by people or vehicles as a place of travel and having no opening into the building at the upper terminal landing.

(n) *Material-handling elevators.* A type of elevator used exclusively for handling materials as part of a material distribution system and utilizing automatic or semiautomatic means for loading or unloading.

(p) *Machine room.* The machine room is that room or enclosed portion of an area of a building intended and used for the elevator and/or dumbwaiter equipment only.

(26) EXISTING INSTALLATIONS. Every installation of equipment that has been completed or for which the contract was let before the effective date of any applicable rule change.

(27) NEW INSTALLATIONS. Every installation of equipment for which the contract has been let on or after the effective date of any applicable rule change.

(a) This shall include every installation of equipment that is changed from the approved installation on record.

(28) ESCALATOR. A power-driven, inclined, continuous arrangement of steps used for raising and lowering passengers.

(29) MOVING WALKS AND MOVING RAMPS.

(a) *Landing.* See section Ind 4.001 (58).

(b) *Moving walk or moving ramp.* A type of passenger-carrying treadway on which passengers stand or walk and in which the passenger-carrying surface remains parallel to its direction of travel and its movement is uninterrupted.

(c) *Moving walk or moving ramp, belt type.* A power-driven continuous belt treadway.

(d) *Moving walk or moving ramp, belt pallet type.* A series of connected and power-driven pallets to which a continuous treadway is fastened.

(e) *Moving walk or moving ramp, pallet type.* A series of connected and power-driven pallets which together constitute the treadway.

(f) *Moving walk or moving ramp, roller type.* A belt supported by a succession of rollers with their axes at right angles to the direction of the treadway motion.

(g) *Moving walk or moving ramp, slider-bed type.* A treadway sliding upon the supporting surface.

(h) *Moving walk, system.* A series of moving walks on an end to end or side by side relationship.

(j) *Pallet.* One of a series of rigid platforms which together form an articulated treadway or the support for a continuous treadway.

(k) *Treadway.* The exposed passenger-carrying member of a moving walk or moving ramp.

(m) *Moving walk.* A moving walk having a slope or angle not exceeding 3 degrees with the horizontal.

(n) *Moving ramp.* A moving ramp having a slope or angle exceeding 3 degrees with the horizontal.

(o) *Threshold comb.* The toothed portion of a threshold plate designed to mesh with a grooved treadway surface.

(p) *Threshold plate.* That portion at the entrance or exit to the treadway consisting of one or more stationary or slightly movable plates.

(30) EMERGENCY STOP SWITCH. An emergency stop switch (safety switch) is a device in the car used manually to cut off the power from the elevator machine independently of the operating devices.

(31) FACIA PLATE. A metal plate not less than $\frac{1}{16}$ inch in thickness, securely fastened, and extending flush from the top of the hoistway landing door frame to the landing sill above and run the full width of the door opening.

(32) FIRE-RESISTIVE CONSTRUCTION.

*Note:* Refer to Building Code, Wis. Adm. Code, section Ind 51.05.

(33) FULL-AUTOMATIC DOOR OR GATE. A vertically moving door or gate which is opened directly by the motion of the elevator car approaching the terminal landings and closed by gravity as the car leaves the landing.

(34) HOISTWAY, ELEVATOR OR POWER DUMBWAITER. A shaftway for the travel of one or more elevators or power dumbwaiters. It includes the pit and terminates at the underside of the overhead machinery space floor or grating, or at the underside of the roof where the hoistway does not penetrate the roof.

(35) HOISTWAY ENCLOSURE. The fixed structure, consisting of vertical walls or partitions, which isolates the hoistway from all other parts of the building or from an adjacent hoistway and in which the hoistway doors and door assemblies are installed.

(36) HOISTWAY ACCESS SWITCH. Switches located at the lower and upper terminal landings to permit access to the pit and top of the car. The car travel limited to a zone sufficient for the full door opening.

(37) HOISTWAY DOOR OR GATE. (a) *Door.* A hoistway landing door is one which completely fills the door opening giving access to the elevator or dumbwaiter car at any landing and is of solid construction,

with or without vision panels, regardless of design or method of operation.

(b) *Gate.* A hoistway landing gate is one which gives access to the elevator car at any landing and consists of slats, bars, spindles, wire screen or expanded metal regardless of the method of operation.

(c) *Hoistway door or gate electric contact.* An electrical device the function of which is to prevent operation of the driving machine by the normal operating device unless the hoistway door or gate is in the closed position.

(d) *Hoistway bi-parting door.* A vertical or horizontal sliding door consisting of 2 or more sections so arranged that the sections, or pairs of sections, open away from each other, and so interconnected that both sections operate simultaneously.

(e) *Hoistway full-automatic door or gate.* A vertically moving door or gate which is opened directly by the motion of the elevator car approaching the landing and closed by gravity as the car leaves the landing.

(f) *Hoistway semi-automatic door or gate.* A door or gate which is opened manually, and which closes automatically as the car leaves the landing.

(g) *Hoistway manually-operated door or gate.* A door or gate which is opened and closed by hand.

(h) *Hoistway power-operated door or gate.* A door or gate which is opened and closed by power other than by hand, gravity, springs, or the movement of the car.

(j) *Hoistway power-operated door or gate, automatically opened.* A door or gate which is opened by power, the opening of the door being initiated by the arrival of the car at or near the landing. The closing of such door or gate may be under the control of the elevator operator or may be automatic.

(k) *Hoistway power-operated door or gate, manually controlled.* A door or gate which is opened and closed by power, the door movement in each direction being controlled by the elevator operator.

(m) *Hoistway, telescoping gate.* A gate in which the sections slip together without distortion of the section.

(n) *Hoistway door, fire-resistive.* See Building Code, Wis. Adm. Code, section Ind 51.09.

(38) HOISTWAY LANDING DOOR INTERLOCKS. (a) *Existing installations.* 1. Mechanical interlocks. A mechanical hoistway landing door interlock is a device, limited to the following:

a. Elevators controlled from the car, and the hoistway provided with horizontally sliding doors equipped with a door locking device at each landing actuated by a related control unit in the car, thereby locking the car switch, lever, crank or wheel to prevent the operation of the driving machine by the normal operating device unless the hoistway landing door at that landing is locked within 4 inches of the fully closed position; and

b. To prevent the opening of a hoistway landing door from the landing side except by means of a special key.

2. Electro-mechanical interlock. A hoistway landing door interlock is a combination of electrical and mechanical devices which are:

a. To prevent the operation of the elevator driving machine by the normal operating device unless all hoistway landing doors are locked within 4 inches of the fully closed position; and

b. To prevent the opening of the hoistway landing doors from the landing side except by means of a special key.

(b) *New installations.* 1. Hoistway door interlock. A device having 2 related and interdependent functions which are:

a. To lock the hoistway landing door in the closed position before the driving machine can be operated by the normal operating device.

b. To prevent the opening of the hoistway landing door from the landing side unless the car is within the leveling zone.

2. Hoistway unit system. A series of hoistway door interlocks, hoistway door electric contacts or hoistway door combination mechanical locks and electric contacts, or a combination thereof, the function of which is to prevent operation of the driving machine by the normal operating device unless all landing doors are locked in the closed position.

(39) LEVELING ZONE. The limited distance above or below an elevator landing, within which the leveling device may cause movement of the car toward the landing.

(40) LEVELING DEVICE, CAR. A leveling device is any mechanism or control which will move the car within a limited zone toward, and stop the car at the landing.

(41) OPERATING DEVICE. A car switch, push button, rope, wheel, lever, treadles, etc., employed to enable the operator to actuate the controller.

(42) BOTTOM OVERTRAVEL OF THE ELEVATOR CAR is the distance the car floor can travel below the level of the lower terminal landing until the weight of the fully loaded car rests on the buffers, and includes the resulting buffer compression.

(43) BOTTOM OVERTRAVEL OF THE COUNTERWEIGHT is the distance the counterweight can travel below its position when the car platform is level with the upper terminal landing until the full weight of the counterweight rests on the buffers, and includes the resulting buffer compression.

(44) AUTOMATIC OPERATION. An operation by means of buttons or switches at the landings, with or without buttons or switches in the car, the momentary pressing of which will cause the car to start and automatically stop at the landing corresponding to the button pressed.

(45) NON-SELECTIVE COLLECTIVE AUTOMATIC OPERATION. An operation by means of one button in the car for each landing level served and one button at each landing, wherein all stops registered by the momentary pressure of landing or car buttons are made irrespective of the number of buttons pressed or of the sequence in which the buttons are pressed. With this type of operation the car stops at all landings for which buttons have been pressed, making the stops in the order in which the landings are reached after the buttons have been pressed but irrespective of its direction of travel.

(46) SELECTIVE COLLECTIVE AUTOMATIC OPERATION. An operation by means of one button in the car for each landing level served and by

"Up" and "Down" button at the landings, wherein all stops registered by the momentary pressure of the car buttons are made as defined under non-selective collective automatic operation, but wherein the stops registered by the momentary pressure of the landing buttons are made in the order in which the landings are reached in each direction of travel after the buttons have been pressed. With this type of operation, all "Up" landing calls are answered when the car is traveling in the "Up" direction and all "Down" landing calls are answered when the car is traveling in the "Down" direction.

(47) SINGLE AUTOMATIC OPERATION. An operation by means of one button in the car for each landing level served and one button at each landing, so arranged that if any car or landing button has been pressed the pressure of any other car or landing operating button will have no effect on the operation of the car until the response to the first button has been completed.

(48) CAR-SWITCH OPERATION. An operation wherein the movement of the car is directly and solely under the control of the operator by means of a switch in the car.

(49) CAR-SWITCH AUTOMATIC FLOOR-STOP OPERATION. An operation in which the stop is initiated by the operator from within the car with a definite reference to the landing at which it is desired to stop, after which the slowing down and stopping of the elevator is automatically effected.

(50) CONTINUOUS-PRESSURE OPERATION. An operation by means of push buttons or switches in the car and at landings, any one of which may be used to control the movement of the car so long as the button or switch is manually held in the operating position.

(51) DUAL OPERATION. A system of operation whereby the elevator controller is arranged for either automatic operation by means of landing and car buttons or switches, or for manual operation by an operator in the car, who may either use a car switch or the buttons provided in the car. When operated by an operator, upon the throwing of a suitable switch or switches, the car can no longer be started by the landing buttons, buttons may, however, be used to signal the operator that the car is desired at certain landings.

(52) PRE-REGISTER OPERATION. An operation in which signals to stop are registered in advance by buttons in the car and at the landings. At the proper point in the car travel the operator in the car is notified by a signal, visual, audible, or otherwise, to initiate the stop, after which the landing stop is automatic.

(53) SIGNAL OPERATION. An operation by means of single buttons or switches (or both) in the car, and up or down direction buttons (or both) at the landings, by which predetermined landing stops may be set up or registered for an elevator or for a group of elevators. The stops set up by the momentary pressure of the car buttons are made automatically in succession as the car reaches those landings, irrespective of its direction of travel or the sequence in which the buttons are pressed. The stops set up by the momentary pressure of the up and down buttons at the landing are made automatically by the first available car in the group approaching the landing in the corresponding direction, irrespective of the sequence in which the

buttons are pressed. With this type of operation the car can be started only by means of a starting switch or button in the car.

(54) POTENTIAL SWITCH, ELEVATOR. An elevator potential switch is a switch which disconnects the power from the elevator apparatus when the supply voltage fails or decreases below a definite value and which is usually opened by various electrical safety devices. These switches are of the magnetic type.

(55) RACEWAYS. Any channel for holding wires, or cables, which is designed expressly for, and used solely for, this purpose. Raceways shall be of metal and this term includes rigid metal conduit, flexible metal conduit or electrical metallic tubing.

(56) SAFETY, CAR OR COUNTERWEIGHT. A mechanical device attached to the car or frame to stop and hold the car or counterweight in case of predetermined overspeed, free fall, or slackening of the cables.

(57) SLACK-CABLE SWITCH, ELEVATOR. A slack-cable switch is a device for automatically cutting off the power in case the hoisting cables become slack.

(58) LANDING. That portion of a floor, balcony, or platform used to reveive and discharge passengers or freight.

(a) *Terminal.* The highest and lowest landing served by the elevator.

(59) OVERHEAD HEIGHT. The overhead height of an elevator is the vertical distance from the top terminal landing level to the lowest point of the overhead structure or any other overhead obstruction directly above the car in the elevator's related hoistway.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; r. and recr. (25) intro. par., and (25) (n); cr. (25) (p); r. and recr. (27) (b), Register, September, 1967, No. 141, eff. 10-1-67; am. (26), r. and recr. (27), Register, December, 1967, No. 144, eff. 1-1-68; r. and recr. (14); am. (25), intro. par., and recr. (25) (a) and (29) (a); am. (58), cr. (59), Register, October, 1970, No. 178, eff. 11-1-70.

## SCOPE

**Ind 4.01 General scope.** The requirements of this code shall apply to every elevator, power dumbwaiter, material handling elevator, moving walk or moving ramp, or escalator installed in public buildings and places of employment as defined by Wisconsin statutes. This requirement applies to both existing installations and those hereafter installed unless otherwise specified.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64.

**Ind 4.02 Renewing of elevator, dumbwaiter, escalator, etc.** Where part or parts of equipment of an elevator, power dumbwaiter, material handling elevator, moving walk or ramp or escalator are impaired through ordinary wear, damage or deterioration by fire or other causes, to 50% of the original condition, the equipment shall be repaired or rebuilt in conformance with the requirements for new installations.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64.

**Ind 4.03 Exemptions.** (1) This code does not apply to the following:

(a) Belt, bucket, scoop, roller or similar inclined or vertical freight conveyors, portable tiering or piling machines when not serving more than the floor on which the tiering or piling machine is located.

(b) Skip hoists, belt manlifts, mine hoists, wharf ramps or apparatus in kindred classes, amusement devices, stage curtain hoists or lift bridges, nor to elevators with a travel less than 56 inches.

(c) Mechanical lifts inclined not greater than 62½ degrees with the horizontal and serving not more than one story and a maximum vertical rise of 14 feet.

(d) For regulations relative to the use of elevators, hoists, derricks and similar equipment during the period of construction of a building or any other structure, see sections Wis. Adm. Code Ind 35.28 to 35.31 inclusive of the general orders on Safety in Construction and Wis. Adm. Code sections Ind 44.01 to 44.37 inclusive, Personnel Hoists, issued by the industrial commission.

(e) For belt manlift requirements, see Wis. Adm. Code, section Ind 1.69, Safety code.

(f) For employment of minors under 18 years of age see Wis. Adm. Code, section Ind 70.09 (1), Wages and Hours code.

**History:** Cr. Register, October, 1964, No. 106, eff. 11–1–64: r. and recr., Register, September, 1967, No. 141, eff. 10–1–67.

**Ind 4.04 Approval of plans.** (1) Every manufacturer, manufacturer's representative or distributor who furnishes elevator, power dumbwaiter, material handling elevator, moving, walk, moving ramp or escalator equipment, shall submit 3 complete plans (See subsection Ind 4.04 (3)) with 2 completed copies of Form SB–22 "Application for Erection or Remodeling" to the Department of Industry, Labor and Human Relations for any new installation or major alteration to existing equipment installations.

**Note:** Application Form SB-22 may be obtained from the Department of Industry, Labor and Human Relations, Division of Industrial Safety and Buildings, Post Office Box 2209, Madison, Wisconsin 53701.

(a) The submission of plans for installation of equipment described in subsection (1) shall be the responsibility of the building owner when the manufacturer, manufacturer's representative or distributor do not satisfy requirements of subsection (1).

(b) Minor alteration or remodeling of existing equipment installations requiring no plan submission, will require two completed copies of Form SB–22 to be submitted to the Department of Industry, Labor and Human Relations before commencing work.

(2) Plans for any new equipment installation or major alteration to existing equipment installations shall be approved before commencing work on installation of equipment.

(3) Complete plans shall include:

(a) Sectional plan of car and hoistway, showing all running clearances.

(b) Section through hoistway, machine room, pit and car showing all necessary applicable dimensions required by section Ind 4.18. All landings shall be clearly shown, indicating types of hoistway doors or gates used.

(c) Plan of machine and machine supports showing reaction loads, material and sizes of beams.

(e) The size and weight per foot of guide rails and details of their support, also their reinforcement where required.

(4) A plan examination fee in the amount established by Wis. Adm. Code section Ind 69.20 shall be paid for each installation requiring approval.

(5) Subsection (1) shall not apply in cities where permits are issued by the city in the manner approved by the Department of Industry, Labor and Human Relations.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; r. and recr., Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.05 Tests and inspections; new installations.** (1) Every elevator, power dumbwaiter, material handling elevator, moving walk or moving ramp, or escalator shall be tested and inspected in conformance with the code requirements by a representative of the industrial commission before the installation is placed in service.

(a) The party installing such an installation shall give notice to the industrial commission not less than 10 days prior to the time the installation is complete and ready for inspection.

(b) A representative of the elevator company shall be present during the final inspection of each installation.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; renum. from Ind 4.08 to be Ind 4.05, Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.06 Inspection fee.** A charge in accordance with the fee schedule established by Wis. Adm. Code section Ind 69.25 will be made by the industrial commission of each inspection of each elevator, power dumbwaiter, material handling elevator, moving walk or moving ramp, or escalator.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; renum. from Ind 4.07 to be Ind 4.06, Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.07 Registration numbers.** (1) All new elevators, dumbwaiters, escalators, moving walks and ramps shall be assigned a unit number.

(2) The registration number shall be located as follows:

(a) For elevators—on the car crosshead.

(b) For dumbwaiters—in or on dumbwaiter car structure.

(c) For escalators, moving walks or ramps—in the machine room at a location easily recognized from access opening.

(3) The registration number shall be on a metal plate, which shall include state of Wisconsin identification.

(4) All existing elevators, dumbwaiters, escalators, moving walks or ramps shall retain unit number previously assigned and in existing locations.

**History:** Cr. Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.08 Inspection by cities.** In any city which provides a competent inspector, the industrial commission will accept inspections by such city, provided the conditions of Wis. Adm. Code section Ind 4.05 (2) (a), (c), (d), and (e) are complied with, substituting "city" for "insurance company".

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; renum. from Ind 4.06 to be Ind 4.08, Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.09 Inspections.** (1) INTERVAL. Every elevator, power dumbwaiter, material handling elevator, moving walk or moving ramp, or escalator operated in the state of Wisconsin shall be subjected to a regular inspection once every 12 months.

(2) INSPECTION BY INSURANCE COMPANIES. The industrial commission may accept inspections of elevators, power dumbwaiters, material

handling elevators, moving walks or moving ramps, and escalators reported by certified inspectors subject to the following conditions:

(a) Each installation shall be inspected at least once every 12 months.

(b) A detailed report of each unit inspected shall be filed with the commission within 14 days after inspection on a printed form approved by the commission. Such report shall show all respects in which the installation fails to comply with the code requirements.

(c) A certificate of inspection on a form approved by the commission shall be posted by the insurance company in a conspicuous place in the elevator car, dumbwaiter cage, material handling elevator, moving walk or moving ramp, or escalator, as the case may be, and shall show the date of inspection, name of insurance company, name of inspector, and rated capacity.

(d) The insurance company shall use all reasonable diligence to secure compliance with the commission's rules. If unsuccessful, it shall so report to the commission. If it then becomes necessary for the commission to make an inspection, the statutory fee for each unit inspected will be charged. (See Wis. Adm. Code section Ind 4.06.)

(e) The competency of each elevator inspector shall be certified by each insurance company to the commission in writing prior to making inspections. Insurance company inspectors will be approved by the commission only after the receipt of acceptable evidence of competency and a satisfactory examination has been passed consisting of written tests.

1. The form referred to under subsection (2) (e) is SB–12 "Insurance Company Elevator Inspector" and is furnished by the industrial commission to insurance company inspectors after their competency has been examined and approved.

**History:** Cr. Register, October, 1964, No. 106, eff. 11–1–64; renum. from Ind 4.05 to be Ind 4.09, Register, October, 1970, No. 178, eff. 11–1–70.

**Ind 4.10 Hoistway enclosures.** (1) EXISTING INSTALLATIONS. (a) The hoistway of every existing passenger or freight elevator or power dumbwaiter where the travel does not exceed 2 stories, and where a fire-resistive enclosure is not required, shall be solidly enclosed with wood or metal to not less than 6 feet in height, and shall withstand a horizontal force of 100 pounds with not more than 1 inch deflection at any point.

(2) NEW INSTALLATIONS. (a) The hoistway of every passenger elevator shall comply with the requirements as described in this subsection.

1. The hoistway enclosure in buildings of ordinary or frame construction shall be not less than 1-hour, fire-resistive construction. (See subsection (2) (c) and (d) and Wis. Adm. Code section Ind 4.31 for hoistway landing doors.)

2. The hoistway, regardless of travel in buildings of fire-resistive or mill construction, shall be enclosed with not less than 2-hour, fire-resistive construction. (See Wis. Adm. Code section Ind 4.31 for hoistway landing doors.)

(b) The hoistway of every freight elevator or power dumbwaiter shall comply with the requirements as described in this subsection.

1. The hoistway in buildings of ordinary or frame construction, where the travel does not exceed 2 stories, shall be solidly enclosed

with wood or metal and shall withstand a horizontal force of 100 pounds with not more than 1 inch deflection at any point. (See subsection (2) (d).)

2. The hoistway in buildings of ordinary or frame construction 3 stories or more in height, shall be enclosed with not less than 1-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.38 and 4.79 for hoistway landing doors.)

3. The hoistway regardless of travel in buildings of fire-resistive or mill construction shall be enclosed with not less than 2-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.38 and 4.79 for hoistway landing doors.)

a. *Exception.* 1. An elevator or power dumbwaiter hoistway which is placed in a fire-resistive stair enclosure, need not have an additional fire-resistive enclosure, but the hoistway shall be solidly guarded above each floor and every stairway with incombustible material and shall withstand a horizontal force of 100 pounds with not more than 1 inch deflection at any point.

b. *Exception.* 2. Elevators installed in power plants or similar buildings where landings consist of grille work, perforated metal or catwalks, the hoistway may be enclosed to a height of not less than 7 feet above each landing, provided the space in front of each car entrance opening shall be enclosed with a solid guard the full height of the hoistway. This guard shall be in a plane not more than 7 inches from the edge of the car.

(c) Where a passenger or freight elevator or power dumbwaiter is installed in a building which includes a *theatre or assembly* hall the hoistway enclosure shall be not less than 2-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.31, 4.38 and 4.79 for hoistway landing doors.)

(d) Where a passenger or freight elevator or power dumbwaiter is installed in an *apartment building, hotel, dormitory, convent, monastery, hospital, nursing home, or place of detention,* the hoistway shall comply with the requirements described in this subsection.

1. Where the building is of ordinary or frame construction and the travel does not exceed 2 stories, the hoistway shall be not less than 1-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.31, 4.38, and 4.79 for hoistway landing doors.)

2. Where the building is of ordinary or frame construction, 3 stories or more in height, the hoistway shall be not less than 2-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.31, 4.38, and 4.79 for hoistway landing doors.)

3. Where the building is of fire-resistive construction, regardless of travel, the hoistway enclosure shall be not less than 2-hour, fire-resistive construction. (See Wis. Adm. Code sections Ind 4.31, 4.38, and 4.79 for hoistway landing doors.)

(e) Windows and ventilator openings shall be prohibited in elevator hoistway walls.

(f) The hoistway for elevators located on the outside of a building shall be enclosed to conform with the requirements as follows:

1. Shall be solidly enclosed at ground floor to the height of not less than 7 feet.

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| To LES KOBLISKA | From BRIAN RAUSCH |
|---|---|
| Co. KOHLER CO. | Co. COMM-WAUKESHA |
| Dept. | Phone # (414) 521-5444 |
| Fax # (920) 457-6979 | Fax # (414) 548-8614 |

2. The hoistway over t enclosed the entire heigh from the edge of the car.

**History:** Cr. Register, O (2) (e), Register, Septemt

**Ind 4.12 Guarding of hoistways; existing installations.** (1) Where a hand cable is operated through the hoistway enclosure, a slot not more than 5 inches wide by not more than 3 feet long with the bottom 30 inches from the floor shall be cut in the enclosure.

*Note: Hand elevators.* On the side on which the pull rope is located, the enclosure may be arranged so as to permit free operation of the pull rope but not more than 15 inches in width.

(2) Where material is stored near a hoistway enclosure, the enclosure shall extend from floor to ceiling.

(3) In every elevator installation where the ceiling height is more than 12 feet, the space between the top of the entrance opening and the ceiling shall be enclosed with vertical wood or metal bars spaced not more than 2 inches apart. This enclosure shall be in a plane not more than 8 inches from the edge of the car.

(4) The hoistway for elevators located on the outside of a building shall be enclosed to conform with the requirements as follows:

(a) Shall be solidly enclosed at the ground floor to a height of not less than 7 feet.

(b) The hoistway over the lower landing entrances shall be solidly enclosed the entire height of the hoistway; not more than 7 inches from the edge of the car.

**History:** Cr. Register, October, 1964, No. 106, eff. 11–1–64.

**Ind 4.14 Guards for outside windows in hoistways; existing installations.** (1) Every outside window in an elevator hoistway shall be guarded on the outside as outlined in the following items:

(a) *Height.*

1. Up to and including the fourth floor.

2. Where a window sill is not more than 15 feet above an adjoining roof.

3. Up to and including the seventh floor on elevators hereafter installed in cities where the fire departments use aerial ladders.

(b) *Material.* Metal bars not less than ½ inch in diameter or equivalent and spaced not more than 10 inches center to center, or wire screen of wire not less than ¼ inch in diameter with mesh not greater than 3 inches, measured along the wire from center to center of wires at points where they cross. If any such screen is hinged, the fastening shall be on the inside.

1. *Exception.* Grain elevators.

*Note:* Flat bars not less than 1 inch wide by ¼ inch thick, with the ends securely anchored, will be considered the equivalent of ½ inch diameter rods.

(2) Where an open side of an elevator car passes a window in a wall of a hoistway and an approved car gate protection is not provided for such open side a guard consisting of vertical metal bars ½ inch in diameter or equivalent, spaced not more than 2 inches apart, or substantial grating, removable if desired, shall be provided over the inside of the window.

**History:** Cr. Register, October, 1964, No. 106, eff. 11–1–64.

**Ind 4.15 Guards for projections in hoistways.** (1) All projections and shearing edges in elevator hoistways such as floors, beams, sills, pipes, bolts and other stationary parts within 4 inches of the edge of the car, unless guarded by the permanent car enclosure, shall be provided with smooth metal guards not less than $\frac{1}{8}$ inch in thickness and beveled to make an angle of not less than 60 degrees with the horizontal.

(a) *Exception.* The requirements of subsection (1) shall not apply to door hangers and power driving devices; nor the projections of 1 inch or less on door lintels; nor to projections into the hoistway on interlocks or other door locking devices where the guarding of such devices would interfere with their proper operation.

(2) Passenger elevators hereafter installed equipped with car gates of the collapsing type shall have the hoistway provided with facia plates flush with the landing sill.

(3) Elevators equipped with a leveling device shall have the hoistway entrance sill provided with vertical guards extending down to a point not less than 2 inches beyond the leveling zone and beveled at the lower edge as required in subsection (1).

(4) Where a leveling device operates the car with the hoistway door or gate open, the under side of the car platform shall be equipped with a vertical guard at least 2 inches longer than the leveling zone.

(a) An inching device, controlled by means of up-and-down continuous pressure buttons or switches located in the car and when used with the hoistway door or gate, or car door or gate open; vertical guards shall be provided below the car platform to conform with subsection (4).

(5) For passenger elevators hereafter installed, the clearance between the edge of the car sill and the hoistway wall or facia plate shall not exceed 4 inches, and the width shall be not less than the full car door or gate opening.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64.

**Ind 4.16 Car and landing clearances.** (1) The clearances between the car entrance sill and any landing sill shall be not less than $\frac{1}{2}$ inch, and not greater than $1\frac{1}{2}$ inches, except for corner post construction the clearance shall be not less than $\frac{3}{4}$ inch.

(2) For every automatic-operation elevator the distance from the hoistway face of the door or gate to the edge of the hoistway sill, measured from the face of the door or gate nearest the car shall be not more than the following:

(a) Swinging doors, 1 inch.

1. Exception: On freight elevators where double swing doors are used with locks and contacts or interlocks, 4 inches is permitted, providing section Ind 4.16 (2) (d) is complied with.

(b) Vertical or horizontal sliding doors, $2\frac{1}{4}$ inches.

(c) Gates, 4 inches.

(d) For existing installations where the clearance exceeds that as outlined in the subsection (2) (a), the space between the hoistway side of the landing door and the edge of the landing sill shall be filled in by suitable means.

(e) The hoistway face of the hoistway landing door or gate shall not project into the hoistway beyond the edge of the landing sill.

(3) For freight elevators other than automatic-operation the distance from the hoistway face of the door or gate to the edge of the hoistway sill measured from the face of the door or gate nearest the car shall be not more than 4 inches.

(4) For freight elevators where hoistway landing gates are provided the clearance between the hoistway wall and the edge of any car entrance sill shall be not greater than 7 inches at any point.

(5) For freight elevators a clearance between the hoistway wall and the edge of any car entrance sill shall be not greater than outlined in this subsection.

(a) Four (4) inches for horizontal sliding hoistway landing doors.

(b) Seven (7) inches for vertical bi-parting counterbalanced hoistway landing doors.

(c) Eight (8) inches for vertical pass type counterbalanced hoistway landing doors.

(6) For every automatic operation elevator the car door or gate shall be so located that the distance from the face of the hoistway door or gate nearest to the landing sill to the face of the car door or gate nearest to the car sill shall be not more than 5½ inches.

(7) The clearance between any part of the elevator hoistway wall and the elevator car or counterweight and appurtenances shall have a clearance of not less than ¾ inch.

(8) The clearance between the car platform and the counterweight shall be not less than 1½ inches.

**History:** Cr. Register, October, 1964, No. 106, eff. 11–1–64; r. and recr. (2) intro. par. and (a), (b) and (c), Register, September, 1967, No. 141, eff. 10–1–67.

**Ind 4.17 Elevator pits.** (1) A pit shall be provided for every power elevator.

(a) The pit shall be at least equal in area to the hoistway. The walls and floor shall be substantially constructed of incombustible material forming a tight enclosure. The construction of the pit floor and supports shall be adequate to resist the impact of the counterweight or the fully loaded car striking the buffer at governor tripping speed. The floor shall be approximately level.

(2) Where water cannot be kept out of a pit with ordinary construction, proper drains or sumps, with or without pumps, shall be provided with cover, or a pit tank shall be constructed of not less than ¼ inch steel plate.

(3) In existing buildings where existing foundation footings are encountered and it is impractical to distrurb the footings, the maximum permissible encroachment shall be not more than 15% of the cubic content of the pit.

(4) Where there is a difference in level of floors of adjacent pits greater than 8 inches, a solid guard of incombustible material shall be provided to separate such pits. Guards shall extend not less than 6 feet above the level of the higher pit floor.

(5) Access shall be provided to all pits to conform with Wis. Adm. Code sections Ind 4.31 (5) (a) and (6) (a) and Ind 4.38 (1) (a) 7. and Ind 4.38 (2) (b) 7. and 8., or by means of a separate pit entrance access door.

(a) Where separate access pit doors are provided the doors shall be at least 2 feet by 6 feet in size and equipped with self-acting locks,

arranged to permit the doors to be opened from inside the pit without a key.

(6) A fixed ladder shall be provided in the pit of every elevator hereafter installed. This ladder shall be of incombustible material, located within reach of the access door and shall extend not less than 30 inches above the sill of the access door, or hand grips shall be provided to the same height.

(a) *Exception.* Where separate pit entrance access doors are provided.

(7) The pit of every power elevator hereafter installed shall be provided with an enclosed emergency stop switch, series connected to the elevator control safety circuit, of the type to satisfy Ind 4.70 (7) (a), (b), (c) and (d).

(a) In pit depths 6 feet 4 inches or less the location of the enclosed emergency stop switch shall satisfy the following conditions:

1. Shall be accessible from the lowest hoistway entrance.
2. Shall be adjacent to the ladder.
3. Shall be within 2 inches of a line parallel with the sill of the lowest hoistway entrance.

(b) In pit depths greater than 6 feet 4 inches enclosed emergency stop switches shall be provided, series connected to the elevator control safety circuit, at the following locations:

1. Provide one switch in the position stated in section Ind 4.17 (7) (a).
2. Provide the additional switch adjacent to the ladder at a height approximately 4 feet 6 inches from the pit floor.

(c) Pits of elevators with separate pit access doors shall have the enclosed emergency stop switch placed adjacent to the nearest point of access to each pit from the pit access door at a height approximately 4 feet 6 inches above pit floor. Ind 4.17 (7) (b) 1. and 2. may be omitted in these installations.

(8) No elevator machine or other machinery shall be located in the elevator pit except equipment used in connection with oil hydraulic or existing sidewalk elevators.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; r. and recr. (7), Register, December, 1967, No. 144, eff. 1-1-68; r. and recr. (3); am. (7) (intro. par.), (7) (a) 3. and (7) (b) 1., Register, October, 1970, No. 178, eff. 11-1-70.

See IND 4.001(59)

**Ind 4.18 Minimum pit depth and overhead height.** (1) The minimum pit depth for every power elevator shall be not less than is required for the installation of buffers, compensating sheaves if any, and all other elevator equipment located therein, and to provide the minimum bottom clearance and runby as required by Ind 4.19 (c) and Ind 4.18 (l) (d).

**Note:** For existing buildings see subsection Ind 4.17 (3).

(a) Where vertical opening biparting freight elevator doors are installed there shall be a minimum of four (4) inches clearance between the pit floor and bottom of the door when fully open.

(b) When the car rests on its buffers, compressed to their extreme mechanical limit, there shall be a vertical clearance of not less than 24 inches between the pit floor and the lowest structural or mechanical part, equipment or device installed beneath the car platform except

guide shoes or rollers, safety jaw assemblies, platform aprons, and elevator hydraulic oil lines.

(c) For cable and hydraulic elevators, the bottom runby for the car and counterweight shall be not less than shown in Table 1.

**TABLE 1**

**BOTTOM RUNBY FOR CAR AND COUNTERWEIGHTS**

| Cable Elevators | | | | Hydraulic Elevators | | |
|---|---|---|---|---|---|---|
| Speed F.P.M. | Control | Buffers | Runby | Speed F.P.M. | Buffers | Runby |
| 25 to 50 | Rheostatic | Spring | 6 Inches | 100 or Less | Spring | 3 Inches |
| Between 51 and 100 | Rheostatic | Spring | 9 Inches | 100 to 300 | Spring | 6 Inches |
| Over 100 | Rheostatic | Spring | 12 Inches | | | |
| Up to 200 | Generator Field Control | Spring | 6 Inches | | | |
| Over 200 | Generator Field Control | Oil | 6 Inches | | | |
| Drum Type Cable Elevators | | | | | | |
| 0 to 25 | Rheostatic | Spring | 3 Inches | | | |
| 25 to 50 | Rheostatic | Spring | 6 Inches | | | |

1. Maximum bottom runby for car shall not exceed 24 inches.

2. The maximum bottom runby for counterweight shall not exceed 36 inches.

(d) The minimum pit depth shall be the sum of the following:

**Note:** See figures 1, 2, and 3 for reference.

1. $C_b$ dim.—24 inches minimum (See section Ind 4.18 (1) (b)).

2. U dim.—Car platform thickness including any structural or mechanical part, equipment or device, such as bolster beam, safety plank, isolation, sheaves, cables, guards, electrical junction boxes, buffer striker plates or any other equipment except platform aprons, guide shoes and/or safety jaws.

3. $R_c$ dim.—Bottom car runby from table 1. (Distance car runs by lowest terminal landing before contacting buffers.)

4. $S_c$ dim.—Extreme mechanical limit of car buffer stroke. (See section Ind 4.19)

5. Exception. When excessively long oil buffers are provided and where practical a pocket not over 30 inches deep may be provided below the normal pit floor to accommodate the lower portion of the oil buffer, provided the pocket is waterproofed and has a substantial solid removable cover to permit the buffer to be removed. Such pocket shall not be included in the pit depth.

(2) The top car clearance of every powered elevator shall be not less than 24 inches plus one-half the gravity stopping distance taken at 115% of rated speed when the car is at its extreme uppermost mechanical limit of travel.

(a) The top clearance of guide shoes, leveling devices, car gate posts and car door or gate opening and closing linkage shall be not less than 4 inches measured vertically to the lowest part of the overhead structure or any other overhead obstruction directly above these appurtenances.

(b) The minimum overhead height for all types of cable driven counterweighted elevators shall be the sum of the following:

**Note:** See figure 1 for reference. For counterweighted hydraulic see subsection (2) (d).

1. $C_t$ dim.—24 inches minimum top car clearance.
2. O dim.—Overall car height from top of platform to car uppermost structure or appurtenances except guide shoes, leveling devices, car gate posts and car door or gate opening and closed linkage.
3. $R_w$ dim.—Bottom counterweight runby. (See table 1)
4. $S_w$ dim.—Counterweight extreme mechanical limit of buffer stroke. (See section Ind 4.19 for minimum buffer stroke requirements.)
5. One-half of the gravity stopping distance taken at 115% of rated speed where oil buffers are used. (See table 7)

(c) The minimum overhead height for winding drum elevators, both overhead and basement type shall be the sum of the following:

**Note:** See figure 2 for reference.

1. $C_t$ dim.—24 inches minimum top car clearance. (See subsection (2) (d))
2. O dim.—Overall car height from top of platform to uppermost structure or appurtenances except guide shoes, leveling devices, car gate posts and car door or gate opening and closing linkage.
3. $R_m$ dim.—Overall distance that car goes above top terminal landing before machine automatically cuts off power.

(d) The minimum overhead height for direct acting plunger hydraulic elevators, with or without counterweights, shall be the sum of the following:

**Note:** See figure 3 for reference.

1. $C_t$ dim.—24 inches minimum top car clearance. (See subsection (2) (d))
2. O dim.—Overall car height from top of platform to car uppermost structure or appurtenance except guide shoes, leveling devices, car gate posts and car door or gate opening and closing linkage.
3. $R_p$ dim.—Overtravel distance that car goes above top terminal landing before plunger reaches its uppermost mechanical limit within its cylinder.

(3) The top counterweight clearance of every power elevator shall be not less than 6 inches plus one-half the gravity stopping distance taken at 115% of rated speed, where oil buffers are used measured vertically from the uppermost point of the counterweight and its appurtenances, except guide shoes and rollers, and the underside of the overhead structure, or any other overhead obstruction, directly above the counterweight when the car is resting on its buffers at their extreme mechanical down limit of travel.

(a) The top counterweight clearance shall be the sum of the following:

**Note:** See figure 1 for reference.

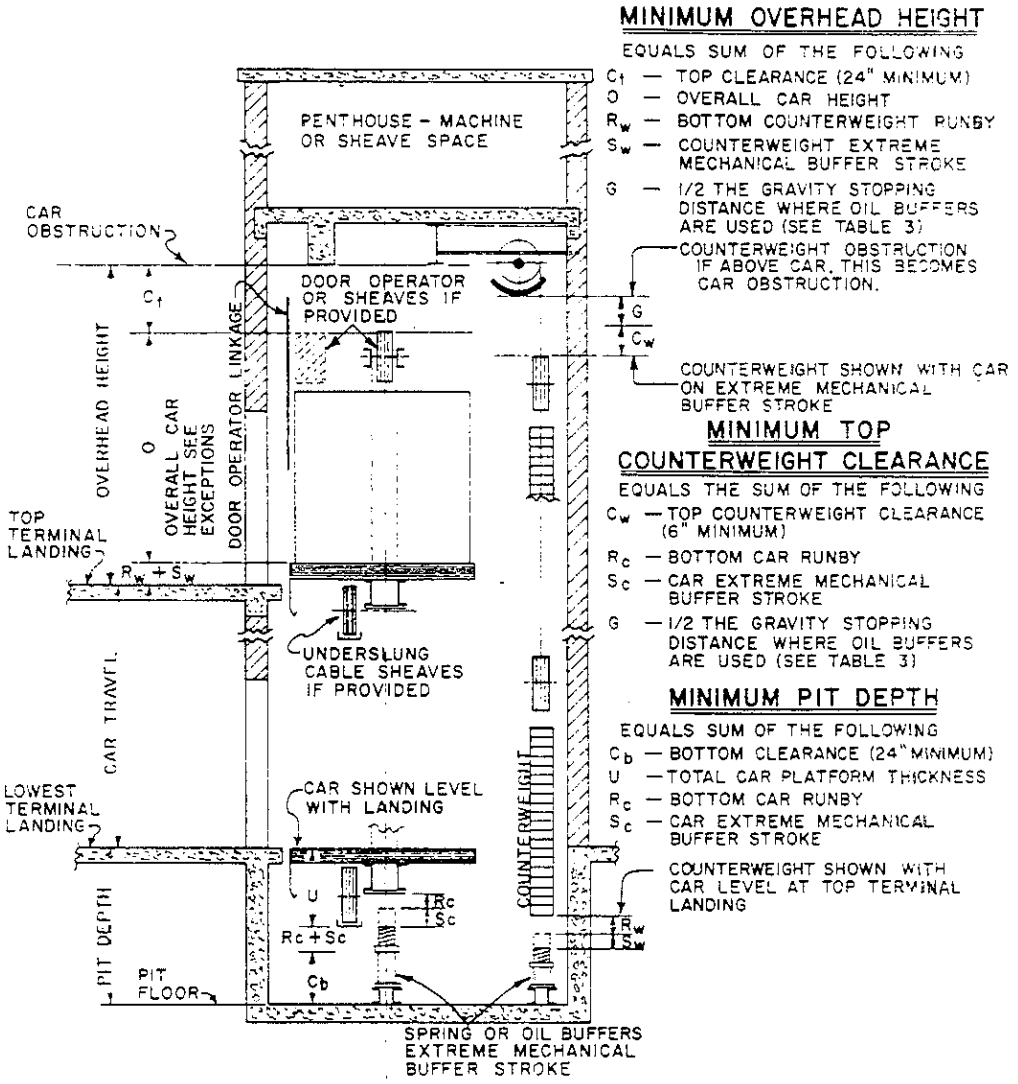
1. $C_w$ dim.—6 inch minimum top counterweight clearance.
2. $R_c$ dim.—Bottom car runby—see Table 1.

3. $S_r$ dim.—Car extreme mechanical buffer stroke.

4. G dim.—½ the gravity stopping distance taken at 115 percent of rated speed. (See table 7.)

(b) In existing buildings where footings and sewer lines prevent sufficient pit depth to satisfy minimum top counterweight clearance, and the elevator is of generator field control type, the bottom car runby may be reduced where spring return oil type buffers are used. The car buffer may be compressed up to 25% of its stroke when the car is level with the lowest terminal landing.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; r. and recr. Register, October, 1970, No. 178, eff. 11-1-70.

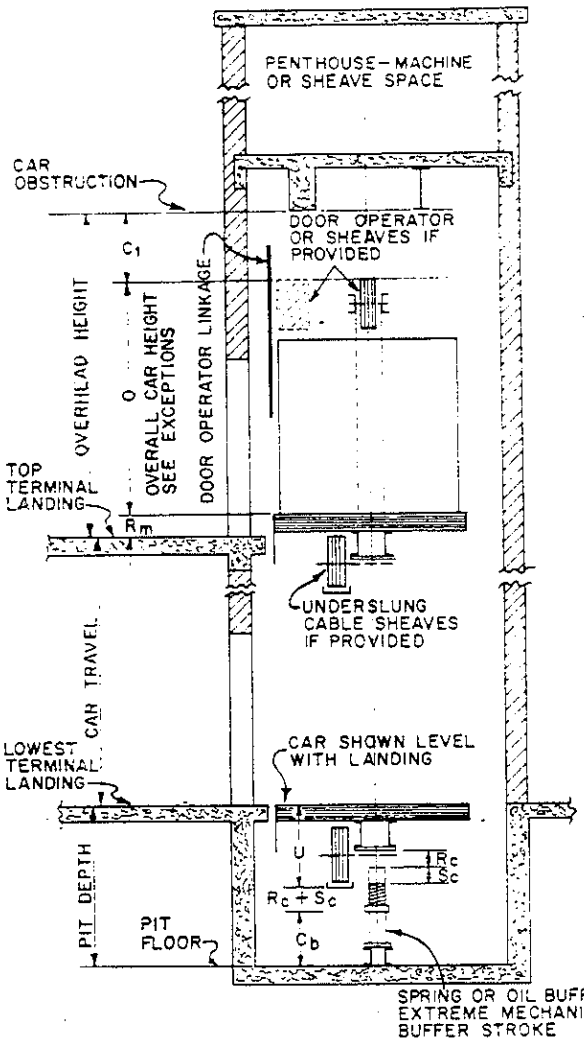



IND. 4.18

PIT DEPTH, OVERHEAD HEIGHT AND COUNTERWEIGHT CLEARANCE FOR ALL TYPES OF CABLE DRIVEN, COUNTERWEIGHTED ELEVATORS

FIGURE 1

3-20-70




**MINIMUM OVERHEAD HEIGHT**

EQUALS SUM OF THE FOLLOWING

$C_1$ — TOP CLEARANCE (24" MINIMUM)

O — OVERALL CAR HEIGHT

$R_m$ — OVERTRAVEL ABOVE LANDING TO MACHINE AUTOMATIC CUTOFF

**MINIMUM PIT DEPTH**

EQUALS SUM OF THE FOLLOWING

$C_b$ — BOTTOM CLEARANCE (24" MINIMUM)

U — TOTAL CAR PLATFORM THICKNESS

$R_c$ — BOTTOM CAR RUNBY

$S_c$ — CAR EXTREME MECHANICAL BUFFER STROKE

IND 4.18

PIT DEPTH AND OVERHEAD HEIGHT FOR CABLE DRIVEN, UNCOUNTERWEIGHTED, WINDING DRUM TYPE ELEVATORS

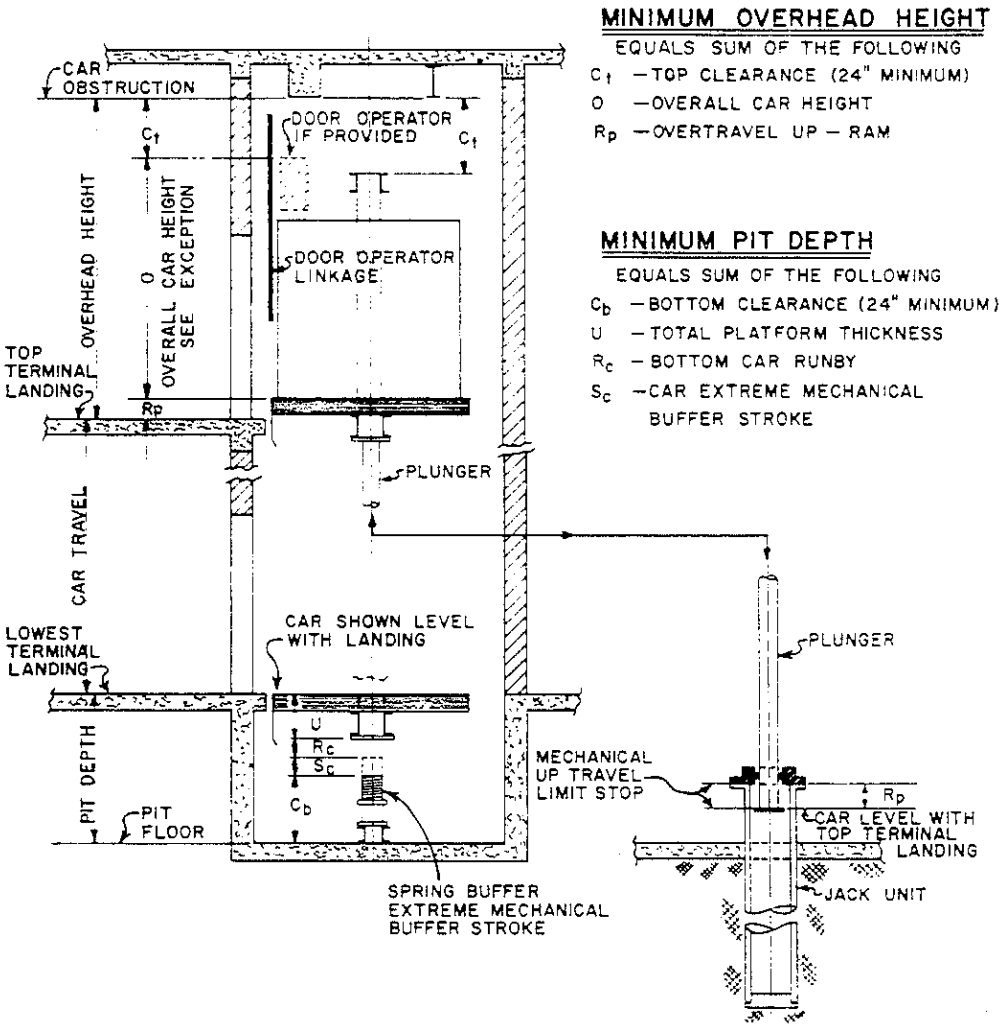
LIMITED TO

MAXIMUM CAPACITY ——— 2500 LBS.
MAXIMUM SPEED ——— 50 FEET PER MINUTE
MAXIMUM TRAVEL ——— 35 FEET

REFER TO IND. 4.61(1)

FIGURE 2

3-20-70




IND. 4.18

PIT DEPTH AND OVERHEAD HEIGHT FOR

DIRECT ACTING PLUNGER HYDRAULIC ELEVATORS

FIGURE 3

REVISED 3-20-70

**Ind 4.19 Buffers.** (1) Spring or oil buffers shall be installed under the cars and counterweights of every power elevator as described in this subsection.

(a) Spring buffers may be used where the contract speed does not exceed 200 ft/min with exception of hydraulic elevators. (See table 1.) than shown in table 6 of this section.

(b) Spring buffers for cars and counterweights shall be capable of supporting a static load having a minimum of twice and a maximum of three times the total weight of the car plus the contract load or of the weight of the counterweight respectively without being compressed completely solid.

(c) The stroke of the buffer springs shall be equal to or greater than shown in Table 6 of this section.

**TABLE 6**

| Contract Car Speed Feet Per Minute | Stroke in Inches |
|---|---|
| 100 or less | 1½ |
| 101 to 150 | 2½ |
| 151 to 200 | 4 |

(2) Approved type oil buffers shall be used for car and counterweight when the contract speed exceeds 200 feet per minute.

*Exception.* Where type C safeties are used, oil buffers are not required in the pit.

(a) Where type C safeties are used, switches shall be provided in connection with the oil buffers as outlined in this subsection.

1. A switch shall be provided which will automatically interrupt the power circuit in the event the buffer is compressed more than 10% of its stroke.

2. A switch shall be provided which will automatically interrupt the power circuit in the event the oil in buffer is below the minimum required level.

(3) Oil buffers shall develop an average retardation not in excess of 32.2 feet per second per second; and shall develop no peak retardation greater than 80.5 feet per second per second having a duration exceeding (1/25th) of a second with any load in the car from contract load to a minimum load of 150 pounds when the buffers are struck with an initial speed of not more than 115% of the rated speed.

(a) The minimum stroke for car and counterweight oil buffer shall be such that the car or counterweight on striking the buffers at 115% of the rated speed as shown in table 7 of this section shall be brought to rest with an average retardation of not more than 32.2 feet per second per second.

(4) When a new or altered elevator is installed in an existing hoistway and foundation footings are encountered as outlined in Wis. Adm. Code section Ind 4.17 (3), the minimum buffer stroke as speci-

**TABLE 7**

| Rated Speed in Feet Per Minute | 115% of Rated Speed in Feet Per Minute | Gravity Slowdown Distance in Inches at 115% of Rated Speed | Minimum Strokes of Oil Buffers Permitted in Inches |
|---|---|---|---|
| 200 | 230 | 2¾ | 2¾ |
| 225 | 259 | 3½ | 3½ |
| 250 | 288 | 4¼ | 4¼ |
| 300 | 345 | 6¼ | 6¼ |
| 350 | 402 | 8¼ | 8¼ |
| 400 | 460 | 11 | 11 |
| 450 | 517 | 13¾ | 13¾ |
| 500 | 575 | 17 | 17 |
| 600 | 690 | 24¾ | 24¾ |
| 700 | 805 | 33¼ | 33¼ |
| 800 | 920 | 43¾ | 43¾ |

fied in Table 7 of this section may be reduced provided an emergency terminal stopping device as described in this subsection is used and which will limit the speed at which the car or counterweight can strike its buffer. The reduced stroke shall be based on at least 115% of the reduced striking speed and shall be not less than 50% of the stroke required for rated speeds under 800 feet per minute, nor less than 33⅓% or 18 inches, whichever is greater.

(a) An emergency terminal stopping device when installed in connection with reduced-stroke oil buffers shall conform with the following requirement.

1. Shall operate independently of the normal terminal stopping switch should this switch fail to slow down the car at the terminal landing as intended.

2. Shall provide a retardation not in excess of 32.2 feet per second per second.

3. Shall not apply the car safety device.

4. Shall be so designed and installed that a single short circuit caused by a combination of grounds, or by other conditions, shall not prevent their functioning.

(5) Oil buffers shall be provided with means of determining that the oil level is within the maximum and minimum allowable limits. Glass sight gauges and pipe plugs shall not be used. Oils used in oil buffers shall have a pour point of zero (0) degrees Fahrenheit or lower and a viscosity index of 75 or higher.

*Note:* The range in viscosity of buffer oil to be used, as specified in Saybolt Seconds Universal will be considered as standard and approved by the industrial commission.

(6) Oil buffers shall have a metal plate securely attached thereto, marked by the manufacturer in a legible and permanent manner, as outlined in this subsection.

(a) The maximum and minimum loads and the maximum striking speeds for which the buffer may be used.

(b) The viscosity of the oil at 100 degrees Fahrenheit to be used.

(c) The viscosity index number of the oil to be used.

(d) The pour point in Fahrenheit of the oil to be used.

(7) Car buffers shall be tested in the field by running on to them with contract load at not less than ½ contract speed. Counterweight buffers shall be similarly tested with empty car. The final limit switch

shall remain operative during these tests and temporarily relocated if necessary for full compression of the buffers. When the load is lifted the buffers shall return to the fully extended position within 90 seconds.

(8) Before field testing an oil buffer, the manufacturer, upon request, shall file for approval with the industrial commission complete information on the buffer design. Certified tests by a recognized testing laboratory may also be accepted as satisfactory evidence for approval.

**History:** Cr. Register, October, 1964, No. 106, eff. 11-1-64; am. (1) (a), Register, October, 1970, No. 178, eff. 11-1-70.

**Ind 4.20 Hoistways, machine rooms and pits. Restrictions. New and existing installations.** (1) Wires, cables, pipes or conductor enclosures shall not be installed in any hoistway nor machine room immediately offset and an integral part of the hoistway, except those needed to serve the elevator or dumbwaiter equipment, including wiring for heating, ventilating, lighting the car or hoistway and wiring for communication with the car.

(a) *Exception.* Other raceways or cables may in exceptional cases be installed in the hoistway only if approved in writing by the industrial commission provided that all openings, terminals, outlet or junction boxes are located outside the hoistway.

(b) *Exception.* In existing installations, pipes in hoistways may remain unless carrying noxious gases, or steam with a pressure exceeding 15 pounds.

(2) No elevator hoistway or pit shall be designed or used as a passageway, or for the storage of material.

(3) There shall be no thoroughfare, occupied or storage space under the hoistway of an elevator unless a structure is provided sufficiently strong to withstand without failure the impact of the car with contract load or the impact of the counterweight on their respective buffers when either is descending at governor tripping speed.

(4) There shall only be elevator and/or dumbwaiter equipment located in the machine room.

(a) Adjoining areas connected with the machine room shall be separated by the following method:

1. A fixed partition not less than 6 feet in height located not less than 3 feet from elevator equipment.

2. On new installations, wires, cables, pipes, or conductor enclosures above the machine room area shall be separated from the machine room area by a fixed unpierced ceiling whose height shall satisfy installation of elevator equipment but in no case be less than 7 feet above the machine room floor.

3. On new installations hazardous piping such as noxious gases, water or steam lines with pressures exceeding 15 pounds per sq. in. shall be isolated from the machine room area by the following means:

a. Unpieced walls, ceiling and entrance door construction.

b. Ceiling height shall satisfy installation of elevator equipment but in no case be less than 7 ft. above the machine room floor.

c. Entrance door sill shall be no less than 6 inches above machine room floor.