(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.* The stationary area at the entrance or exit from a moving walk or moving ramp.

(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.

tion 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) TERMINAL LANDING. The highest and lowest landing served by the elevator.

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.

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.

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) Where existing foundation footings are encountered in a new or altered installation and it is impractical to disturb 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 switch 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 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 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 approxi-

mately 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, 19671, No. 144, eff. 1–1–68.

Ind 4.18 Minimum pit depth and overhead clearance. (1) The pit depth for every power elevator hereafter installed shall be not less than the number of inches specified in the requirements outlined in Tables 2 and 3 of this section. The depth of trenches, depressions or foundation encroachments as of Wis. Adm. Code section Ind 4.17 (3) shall not be considered in determining the pit depth.

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

TABLE 1

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			

1. Maximum bottom runby for car shall not exceed 12 inches.

2. The maximum bottom runby for counterweight shall not exceed 24 inches.

(b) The minimum pit depth for elevators hereafter installed requiring spring buffers shall be not less than shown in Table 2.

TABLE 2

MINIMUM PIT DEPTH—ELEVATORS HAVING SPRING BUFFERS

Contract Speed F.P.M.	Capacity 0 to 3000	Capacity 3001 to 6000	Capacity 6001 to 10,000	Capacity 10,001 to 16,000	Capacity 16,000 and over
25 to 50	42 inches	48 inches	54 inches	60 inches	66 inches
51 to 100	48 inches	54 inches	60 inches	66 inches	72 inches
101 to 200	54 inches	60 inches	66 inches	72 inches	76 inches

(c) The minimum pit depth for elevators requiring oil buffers shall be not less than shown in Table 3.

TABLE 3

MINIMUM PIT DEPTH—ELEVATORS HAVING OIL BUFFERS

Contract Speed F.P.M.	Capacities up to 10,000 pounds	Capacities 10,001 pounds and over
201 to 300	76 inches	82 inches
301 to 400	88 inches	94 inches
401 to 500	104 inches	110 inches
501 to 600	120 inches	126 inches
601 to 700	138 inches	144 inches
701 to 800	150 inches	156 inches

Note: Interpolation may be used for intermediate speeds.

of this subsection. These identifying marks may be labels or certifications based on tests submitted from a recognized testing laboratory. (See Wis. Adm. Code section Ind 4.10.)

(c) The section of each hoistway door shall be so constructed as to withstand a constant force of 250 pounds applied at right angles to and at approximately the center of the door, without causing the door to break or to be permanently deformed.

1. Horizontally sliding doors shall be so hung and guided that the doors will not be displaced from their guides or tracks when in normal service. Bottom guide shoes shall be made of or reinforced with metal so that in case of fire the guide shoe will prevent the door from being displaced from its guides.

2. Hangers for horizontally sliding doors shall be provided with means to prevent the doors from jumping the tracks. Stops shall be provided to prevent the hanger from leaving the ends of the track. Hangers and tracks shall be so designed and installed as to support the door in case of fire.

3. The hangers, tracks and their supporting brackets and fastenings for horizontally sliding power operated doors shall be constructed to withstand without damage of appreciable deflection, an imposed load equal to 4 times the weight of the door as applied successively downward and upward at the vertical center line of the assembled door or of each door section.

4. The leading edge of all horizontally sliding doors shall be smooth and free of sharp projections. The meeting edges of center-opening doors may be provided with a fire-resistive member on one or both doors to form a shallow overlap. Single and two-speed doors shall lap the strike jambs but shall not close into pockets in the strike jambs. The clearance between the corridor face of the doors and the bucks and header, and the clearance between overlapping faces of two-speed doors shall not exceed ⅜ inch.

(2) Horizontally sliding or swinging doors of automatic operation elevators hereafter installed shall be provided with door closers.

(3) Vertically sliding or doors of the vertically bi-parting type shall not be used to protect landing openings, except doors used exclusively for freight.

(4) For existing installations, the upper sections of such doors may be solid metal or of wire glass provided the glass pane is not less than ¼ inch thick nor greater than 720 square inches and not more than 54 inches vertical and 48 inches horizontal dimension.

(5) Existing installations:

(a) Every elevator controlled from the car only, shall be provided with an emergency key, not easily duplicated, to open the lowest terminal landing door from the landing side regardless of the car position.

1. The emergency key opening shall be provided with a cover fastened securely with Phillips head-type screws.

(b) For every automatic operation elevator where an emergency key opening, or any similar means has been provided for opening a hoistway landing door, the key opening or similar means shall be provided with a cover fastened securely with Phillips head-type screws.

(c) Emergency keys shall be kept in a receptacle having a transparent breakable cover. This receptacle shall be located at the lowest landing and shall be clearly marked "Elevator Door Key for Fire Department and Emergency Use Only".

(d) Emergency keys shall be provided to conform with subsection (6) for elevators installed after May 1, 1957 where the state registration number is 10959 or over.

(6) New installations:

(a) Emergency keys, not easily duplicated, shall be provided for elevators hereafter installed, to open certain hoistway landing doors from the landing side regardless of car position, in the manner and subject to the conditions described in this subsection.

(b) Emergency key openings shall be provided for landing doors for every automatic push button controlled elevator.

(c) Emergency key openings shall be provided at the lowest terminal landing for elevators controlled from the car only.

(d) All emergency key openings shall be provided with a cover fastened securely to the landing door with Phillips head-type screws.

1. *Exception.* Emergency key openings not greater than ½ inch in diameter which require the use of keys of the jointed design and the hinged action cause the release of the door interlocks.

(e) Emergency keys shall be kept in a receptacle having a transparent breakable cover. This receptacle shall be located immediately adjacent to the lowest landing and shall be clearly marked "Elevator Door Key for Fire Department and Emergency Use Only".

(7) Hoistway access switches are not required, but, where installed shall conform with the requirements and operation outlined as follows:

(a) Hoistway access switches shall be installed at the top and/or bottom terminal landings. The top terminal landing car travel shall be limited to the full door opening to permit access to the top of the car; and the bottom terminal landing car travel shall be limited to the full door opening to permit access to the pit. These switches shall be located immediately adjacent to the hoistway doorways at these landings and shall not be installed at any other landings or in the car.

(b) The hoistway access switch shall be of the continuous-pressure spring-return type and shall be operated by a cylinder type lock having not less than a 5 pin or 5 disk combination with the key removable only when the switch is in the "off" position. The lock shall not be operable by any key which will operate any other lock or device which is used for any other purpose in the building. The key shall be available to and used only by inspectors, maintenance men, and repairmen.

(c) The operation of the hoistway access switch at either terminal landing shall permit movement of the car with the hoistway door at this landing unlocked or open and with the car door or gate open, subject to the following:

1. The operation of the access switch shall not render ineffective the hoistway door interlock or electric contact at any other landing.

2. The car shall not operate at a speed greater than 100 feet per minute.

3. For automatic operation elevators the normal operation shall first be made inoperative by means other than the access switch and the power operation of the hoistway door and/or car door or gate shall be inoperative.

4. Automatic operation by a car-leveling device shall be inoperative.

5. The operating device on top of the car as of Wis. Adm. Code section Ind 4.70 (3) shall be inoperative.

(8) Vision panels shall be provided in all hoistway landing doors of every automatic operated elevator except at landings where a hall position indicator is provided or where car and landing doors are power operated. All swing type hoistway doors shall be provided with vision panels. Where required or used, vision panels shall comply with the requirements as described in this subsection.

(a) The total area of any single panel shall not be less than 25 square inches or more than 80 square inches, and no single glass panel shall have a width exceeding 6 inches.

(b) Where mullions or division strips are used between panels, they shall be of fire-resistant material and of substantial construction.

(c) Panel openings shall be of glazed clear wire glass not less than ¼ inch thick, and shall be substantially flush with the surface of the landing side of the door.

(d) The center of a panel shall be not less than 54 inches nor more than 66 inches, above the elevator landing.

(9) On existing installations where the glass vision panel is in excess of 80 square inches, mullion or division strips shall be provided and no single glass panel shall have a width exceeding 6 inches.

(10) Where an elevator is installed in a single blind hoistway there shall be installed in the blind portion of the hoistway an emergency door at every third floor but not more than 36 feet apart and shall comply with the requirements outlined in this subsection.

(a) It shall be not less than 30 inches wide and 6 feet 6 inches in height and easily accessible and free from fixed obstructions.

(b) It shall be either of the horizontally sliding or swinging type irrespective of the type of door installed at the other landings.

(c) It shall be self-closing and self-locking and shall be marked in letters not less than 2 inches high, "DANGER ELEVATOR HOISTWAY".

(d) It shall be provided with a hoistway door electric contact. It shall be unlocked only from the landing side through the use of a cylinder type lock having not less than a 5 pin or 5 disk combination. The cylinder lock shall:

1. Be located not less than 5 feet above the floor.

2. Not be unlocked by any key which will open any other lock or device used for any other purpose in the building.

3. Be so designed that the key shall be removable only in the locked position and shall be kept where it is accessible only to authorized persons.

History: Cr. Register, October, 1964, No. 106, eff. 11–1–64; r. and recr. (6) (b), Register, December, 1967, No. 144, eff. 1–1–68.

Ind 4.32 Passenger elevator, (hoistway landing door interlocks). (1) EXISTING INSTALLATIONS. (a) Interlocks, either mechanical or

electro-mechanical shall be provided on the door of every passenger elevator installation as described in this subsection.

1. A mechanical interlock when provided shall 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 prevent the opening of a hoistway landing door from the landing side, except by means of a special key.

2. An electro-mechanical interlock (a combination of electrical and mechanical devices) when provided shall 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 nearest face of the jamb and, provided that the door will eventually be closed and locked within ⅜ inch of the nearest face of the jamb; and prevent the opening of a hoistway landing door from the landing side, except by means of a special key.

3. The functioning of the landing door interlock shall prevent the movement of the car and shall not be dependent solely on the action of a spring or springs in tension, nor solely upon gravity, nor shall it be dependent on the closing of an electric circuit.

(2) NEW INSTALLATIONS. (a) *Interlock.* A hoistway door interlock shall be provided on the door of every passenger elevator installation as described in this subsection.

1. Interlock contacts shall be positively opened by the locking member or by a member connected to and mechanically operated by the locking member, and the contacts shall be maintained in the open position by the action of gravity or by a restrained compression spring, or by both, or by means of the opening member.

2. The interlock latching mechanism shall hold the door in the closed and locked position by means of gravity or by a restrained compression spring or by both, or by means of a positive linkage.

3. The interlock shall lock the door in the closed position before the driving machine can be operated by the normal operating device.

4. The interlocks shall prevent the operation of the driving machine by the normal operating device unless all hoistway doors are closed and locked within ⅜ inch of the fully closed position.

a. *Exception.* The interlock is not required to prevent the operation of the car when being moved within the leveling zone or by means of the access switch as described in Wis. Adm. Code in section Ind 4.31 (7).

(b) Interlocks, used with multi-section doors, shall conform with the requirements outlined as follows:

1. They shall lock all sections of the door, but may be applied to only one section of the door provided the device used to interconnect the door sections is so arranged that lockng one section will prevent the opening of all sections.

(c) Interlock systems employing a single master switch for more than one door is prohibited.

(d) Retiring cams used to actuate an interlock shall exert a force at least double the average force required to operate the interlock

sufficient length to maintain the switches in the open position to the extreme car travel.

(2) Every power elevator hereafter installed shall be equipped with directional limit switches at each terminal of travel. These switches shall function independently of the operation of the floor selector stopping devices; and operated by the movement of the car and shall stop the car approximately level at each terminal landing.

(a) Where final limit switches are not required, directional limit switches shall be mounted to the guide rails and directly operated by a cam attached to the car.

(3) Every drum type elevator machine shall be equipped with an approved machine automatic terminal stopping device which will automatcially stop the machine in the event the car over-travels either of the terminal landings.

(a) For alternating current drum type elevator machines hereafter installed, the terminal stopping device as outlined in Wis. Adm. Code section (4) shall also open the electric circuit to the motor and brake. This device shall be in addition to the final limit switches required in Wis. Adm. Code section Ind 4.63 (1).

History: Cr. Register, October, 1964, No. 106, eff. 11-1-64. r. (3); renum. (4) to be (3), Register, December, 1967, No. 144, eff. 1-1-68.

Ind 4.64 Car safety devices. (1) An approved car safety device capable of stopping and sustaining the car with contract load in the down direction shall be attached to every elevator except:

(a) Freight elevators which travel not more than 10 feet.

(b) Direct lift plunger elevators.

(c) Existing carriage type elevators which travel not more than 18 feet.

(2) For speeds greater than 125 feet per minute Type B (sliding type) or Type C (combination instantaneous and oil-buffer) car safety device shall be required.

(3) Every car safety device shall be attached to and located within or below the lower members of the car frame (safety plank). The gripping surfaces of a car or counterweight safety device shall not be used to guide the car or counterweight. Safeties shall be applied mechanically and shall be so designed that on their application the forces which provide the stopping action shall be compressive forces on each side of the guide rail section.

(4) Multiple car safeties may be used subject to the approval of the industrial commission providing the lower safety shall be capable of developing not less than ½ of the force required to stop the entire car with rated load and the duplex safeties shall function simultaneously; these safeties shall be of the "B" type.

(5) Counterweight safeties, where required, shall meet the requirements of car safeties. (See Wis. Adm. Code section Ind 4.20 (3).)

(6) Every drum or idler sheave which is underneath the car and is used to actuate the car safety device shall be so guarded to prevent the cable leaving the drum or sheave and shall be securely fastened directly to the car frame or by means of metal brackets.

(7) A cutout switch shall be provided on the car safety device of every elevator hereafter installed, which shall remove the power from the driving-machine-motor and brake; at the initial movement of the safety device before or at the time of application of the governor.

(8) Car safety devices shall be identified and classified on the basis of performance characteristics after the safety begins to apply pressure on the guide rails as outlined in this subsection.

(a) *Type A Safeties.* Instantaneous type safeties shall be limited to elevators where the contract speed does not exceed 125 feet per minute.

Note: Type A safeties develop a rapidly increasing pressure on the guide rails during the stopping interval, the stopping distance being instantaneous to the inherent design of the safety. The operating force is derived entirely from the mass and the motion of the car or the counterweight being stopped. These safeties apply pressure on the guide rails through eccentric dogs or rollers without any flexible medium purposely introduced to limit the retarding force and increase the stopping distance.

(b) *Type B Safeties.* Shall be provided where the contract speed exceeds 125 feet per minute. The safeties shall when operated, stop the fully loaded car within the maximum stopping distances as specified in Table 17 of this section on the basis of the governor tripping speed.

TABLE 17

MAXIMUM STOPPING DISTANCES—TYPE B CAR SAFETIES WITH RATED LOAD

Rated Speed in Ft. Per Minute	Maximum Governor Tripping Speed in Ft. Per Min.	Stopping Distance in Feet—Inches	
		Wedge-Clamp Safety* Gradual-Wedge-Clamp Safety**	Flexible Guide-Clamp Safety***
0 to 125	175	6- 0	1- 3
150	210	6- 1	1- 4
175	250	6- 2	1- 7
200	280	6- 3	1-10
225	308	6- 5	2- 0
250	337	6- 8	2- 3
300	395	6-11	2- 9
350	452	7- 3	3- 4
400	510	7-10	4- 0
450	568	8- 3	4-10
500	625	8-10	5- 8
600	740	9-11	7- 7
700	855	11- 1	9-10
800	970	12- 4	12- 6

Note: B safeties of the sliding type are divided into 3 classes outlined as follows:

* Wedge-clamp is one where the wedges are applied against the rails through the unwinding of a cable-operated drum, and threaded screws, and the connections between the safety drum and the safety wedges are rigid and no elastic member is provided in the jaw assembly. Travel of the wedges increases the pressure on the jaws.

** Gradual-wedge-clamp is similar in design and construction as the wedge-clamp safety except that an elastic member such as spring or springs are provided on the safety device to obtain a predetermined constant retarding force.

*** Flexible-guide-clamp. Safeties of this type have vertical sliding wedge-type jaws, in which the retarding force is derived from the proportional to the pressure exerted by the compression of spring or springs, directly applying the jaws to the rails. The retarding forces are reasonably uniform after the safety is fully applied.