



## 14200

### **Elevators**

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### **A. Summary**

This section contains the general design criteria for elevators.

### **B. System Design and Performance Requirement**

1. Design elevator systems that meet project program requirements and fulfill basic project functions.
2. Elevator systems move people or freight between levels, or from one area to another, and comprise the following elements.
  - a. Elevators—all components for passenger, service and freight elevators, including items such as shaft rails, pit ladders, exhaust louvers, and car and hoistway doors.
  - b. People lifts—all devices that convey people vertically but do not qualify as elevators, including inclined wheelchair lifts and stairway chairlifts.
  - c. Dumbwaiters—electrically powered devices for moving materials and small objects vertically.



3. Provide elevator systems for moving people when any of the following conditions occur.
  - a. The building or portion of the building is more than one story tall and movement of people between floors is required. Calculate the building population for occupancy in accordance with code.
  - b. The average projected traffic between adjacent levels is essentially constant over long periods of time or occurs in predictable surges, and at least 1500 people per hour, moving in each direction, must be accommodated.
4. Provide elevator systems for moving materials when any of the following conditions occur.
  - a. Deliveries are at ground level and items must be moved to basement level.
  - b. The building or portion of the building is more than two stories tall, and the need for occasional movement of large objects, materials, or equipment between floors is likely.
  - c. There is likely to be a frequent need to move small items vertically between areas that are not more than three floors apart.
  - d. Freight elevators must meet the following minimum criteria.
    - Minimum load capacity of 2500 lb (1130 kg)
    - Minimum loading area of 29 sq ft (2.7 sq m)
    - Minimum height of 100" (2540 mm)
    - Capable of carrying passengers
    - Equipped with removable finish protection
5. Provide at least one accessible passenger elevator, complying with code, that serves every habitable level.
6. Provide a passenger conveying system that provides the following convenience locations.
  - a. Locate elevators not more than 100' (30 m) from primary building entrances.
  - b. Locate elevator entry and exit points not more than 100' (30 m) apart when conveying systems are zoned and require transfers for a single vertical journey.
  - c. Locate elevators adjacent to exterior walls to minimize obstruction of floor space.
  - d. Locate elevators as close to the center of the building as possible for maximum convenience and minimum travel times.



7. The waiting interval for called elevators must not exceed 25–30 seconds.
8. Elevator systems must be able to carry 5–7% of the building population in five minutes.
9. The average travel time must not exceed 60 seconds.
10. Maintain ambient sound levels in spaces that include, or are adjacent to operating conveying systems, within the levels specified in [Section 00700: General Design Conditions](#).
11. Provide conveying systems that appear to be solid and monolithic in appearance, using opaque enclosures and massive materials.
12. Where vertical conveying systems must pass through fire resistant floor construction, provide fire resistance in conformance with code.
  - a. Shaft enclosures must have at least a two-hour fire resistance rating.
  - b. Doors must have at least a 1-1/2 hour labeled fire protection rating.
  - c. The maximum number of vertical conveyances per enclosure is two.
13. Provide conveying systems with the same functional service life specified for the project, assuming that they will have continuing professional maintenance and periodic replacement of worn parts.
14. Provide conveying systems that operate automatically or in response to passenger input, without intervention by operators.
15. Provide conveying systems with features and mechanisms that will prevent or minimize unsafe conditions or inconvenience attributable to vandalism, pranks, or deliberate sabotage.
16. Provide conveying systems designed to require minimum maintenance.
17. Provide an audible sound for the floor selection buttons.

### C. Product Standards

Unless otherwise indicated, products must conform to the provisions of ANSI/ASME A17.1 and Yale University accessibility guidelines.



### D. Manufacturers

Subject to compliance with the design and materials requirements, provide products and/or components by the following manufacturers:

- Otis
- Schindler
- Thyssen Krupp
- GAL Corporation
- Hollister Whitney
- Titan
- Motion Control Engineering
- Computerized Elevator Controls
- Elevator Controls, Inc.

### E. Materials

1. Controllers must be generic, non-proprietary microprocessor equipment available through non-installer manufacturers, with provisions for non-proprietary self-diagnostics.
2. All materials and equipment must be industry standard with a history of reliable usage in this geographical area.
3. Provide heavy duty automatic door operators with:
  - Direct current or variable-frequency, variable-voltage, AC motors
  - Nudging
  - Minimum 40-beam, infrared, non-contact door reversing system
4. Hoistway entrances must be single-speed, side slide, two-speed side slide, or center opening.
5. Use one of the following hoistway entrance and door finishes:
  - Stainless steel, No. 4 satin directional finish
  - Bronze alloy, 220 commercial bronze satin finish
  - Baked enamel on steel
6. Cabs must be of sound, insulated steel shell construction, with sub-flooring of two layers of marine plywood. Interior panels are selected by the architect and approved by Yale University. Provide cab pads, hooks, and a two-speed fan.



7. The car operating panel must include:
  - A service cabinet with an independent service key switch and 110 volt GFCI receptacle
  - An emergency lighting and alarm bell power supply (four hour minimum)
  - An ADA-compliant emergency telephone
  - Best lock key switches for use by Yale University (cores are provided by the University)
  - A security card reader in the car panel
8. The cab handrails must be wood or stainless steel bronze with a satin finish.
9. Signals must include:
  - Illuminated car and hall buttons
  - Position indicators in the car and hall
  - Hall lanterns at all floors or a direction/arrival lantern in the car
  - Automatic fire recall with firefighter's service
  - A visual audible signal required for accessibility standards
10. Provide dedicated, 480-volt, three-phase power supplies for:
  - Cab lighting
  - Emergency lighting in the machine room
11. Provide planed, steel tee guide rails and adjustable spring tension roller glides.
12. Provide a sump pit and sump pump.

## **F. Special Requirements**

Provide one year of preventive maintenance, including 24-hour emergency call backs.

## **G. Electric Elevator Components and Features**

- Operation:
  - Selective collective; simplex, duplex or group
  - Geared traction type for speeds up to 400 fpm
  - Gearless traction type for speeds of 400 fpm and greater
- Minimum capacity of 2000 lbs
- Minimum speed of 200 fpm



## H. Hydraulic Elevator Components and Features

- Single-acting, plunger–cylinder hydraulic unit
- Minimum capacity of 2000 lbs
- Minimum speed of 125 fpm
- The size must meet ADA requirements
- Well hole and casing:
  - Outer Casing: Steel, minimum of 18" dia. with welded, waterproof bottom.
  - Sleeve: Schedule 40 PVC, watertight sleeve over jack cylinder.
  - Fill void between PVC sleeve and steel casing with sand.
- Hydraulic unit:
  - Low oil protective device
  - Mainline strainer
  - Oil muffler
  - Sound isolation couplings (minimum of two)
  - Scavenger pump
  - Battery operated emergency return power supply

End of Section