

Port of Portland Conveying Equipment Guidelines

ELEVATOR, ESCALATOR, AND MOVING WALK DESIGN

OVERVIEW

The Division 14 specification sections include appropriate information for products and installation of elevators, escalators, and moving walks but does not include the related work of other disciplines. Verify the following items are included in other specification sections or the drawings.

ELEVATOR HOISTWAY AND PIT

1. Clear, plumb, substantially flush hoistway with variations not to exceed 1" at any point.
2. Supports at each floor for car guide rail fastening. Intermediate car guide rail support with floor heights exceed 14'-0" or as designated. Building supports not to deflect in excess of 1/8" under normal conditions, 1/4" under applicable seismic conditions.
3. Provide steel channel frames at each elevator entrance.
4. Bevel ledges, at 75 degrees from the horizontal, of any hoistway ledges and beams that project 4" or more into the hoistway.
5. Hoistway venting per building code.
6. Provide sleeves for electrical wiring duct between hoistway wall to elevator machine room.
7. Grout floor up to hoistway sills to meet ASME A17.1.
8. Provide waterproof pit and indirect waste drain or sump with flush grate and pump. Pump/drain capacity shall be minimum 3,000 gallons per hour, per elevator. Provide grease oil separator.
9. Provide a fixed vertical pit ladder extending 48" above the hoistway sill of lowest landing. Ladder rungs require 7" distance from rungs to nearest permanent object. Vertical rung-to-rung distance shall be 12". Provide rungs entire height of ladder. Provide handhold at top of ladder. Width of ladder shall be 16". Ladder shall be manufactured of round metal.
10. Provide sleeves for the hall push button stations, lanterns, and door unlocking devices at each floor.

Traction Elevators Only:

1. Structural supports for buffer and guide rail loads. Provide adequate supports for guide rail brackets. Guide rail support locations must be steel, brick, concrete or filled concrete block. Show location of inserts, if used.
2. Reinforce dry pit to sustain normal vertical loads from rails and impact loads from buffer.

Hydraulic Elevators Only:

1. Structural supports for hydraulic jack unit, buffer and guide rail loads. Provide adequate supports for guide rail brackets. Guide rail support locations must be steel, brick, concrete or filled concrete block. Show location of inserts, if used.

2. Hole in pit floor, 3'-0" square, to facilitate installation of protective secondary containment casing by elevator installer. Fill hole with concrete after jack installation. Seal pit with non-permeable epoxy.
3. Drill hydraulic hole of required depth. Diameter shall be 20". Provide steel casing of 1/4" steel wall entire depth of hole. Seal bottom of casing.
4. Reinforce dry pit to sustain normal vertical loads from rails and impact loads from buffer and cylinder.

ELEVATOR MACHINE ROOM

1. Code approved fire rated elevator machine room.
2. Self-closing and self-locking fire rated access door. The lock shall be a spring-type lock arranged to permit the door to be opened from the inside without a key. Minimum door size of 3'-6" wide x 7'-0" high.
3. Painting elevator machine room walls, ceiling and floor.
4. Provide minimum 5 lb. Class ABC fire extinguisher. Provide metal bracket and fasten to machine room wall on the lock side of machine room access door.
5. Machinery spaces, machine rooms, control spaces, and control rooms shall be provided with natural or mechanical means to keep the ambient air temperature and humidity in the range specified by the elevator equipment manufacturer to ensure safe and normal operation of the elevator. The temperature and humidity range shall be permanently posted in the machine room, control room, control space, or where specified by the equipment manufacturer, in the machinery space. Typically, ventilation and heating shall maintain minimum temperature of 55 degrees and a maximum of 90 degrees with a maximum 80% relative humidity, non-condensing.

ELEVATOR ELECTRICAL SERVICE, CONDUCTORS, AND DEVICES:

1. All electrical conductors shall be copper.
2. Provide engraved plate on all protected electrical devices stating panel, breaker, and room of feeder supplying device.
3. Proper electric power mains, including dedicated ground conductor to the electrical main line disconnect switch. Voltage variations to be within + or - 5% of normal electrical power. Frequency variations to be within + or - 2% Hertz. Locate disconnect at strike side of door within 24".
4. Single-phase power feeder to elevator intercom amplifier in the elevator machine room.
5. Provide fused and lockable, in the open position, main line electrical disconnect switches for elevator controller. Provide required conduit and electrical wiring, including electrical ground conductor, from main line disconnect to elevator controller. Provide fuses of correct rating.
6. Provide lockable disconnect switch box-20A-120 VAC separate electrical circuit to elevator controller for car lighting, receptacles, auxiliary lighting power source and ventilation. Disconnect switch shall be located in the elevator machine room and located as to not violate the elevator equipment electrical clearance requirements. Switch shall be marked with a metal tag of one half inch letters, stating "Car Lighting". Provide all wiring including conduit from disconnect switch to elevator controller.
7. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected lockable "open" disconnecting means with auxiliary contacts to allow elevator installer to electrically interlock battery power lowering unit.

8. Provide an electrical shunt trip device. Provide a fixed temperature heat detector 135° F shall be ceiling mounted and within 18" of each water sprinkler head. Heat detectors shall be connected to the electrical shunt trip and activate the shunt trip, prior to the application of water from the water sprinkler heads, when activated. Each heat detector shall be identified, with a metal tag of 1/2" letters, as follows; "Elevator Control Only-Do Not Test". Electrical shunt trip device shall be enclosed in a watertight electrical box. Electrical power for the shunt trip device shall be derived from the load side of the elevator main line disconnect switch. The disconnect control device, shunt trip, shall be located in the elevator machine room and shall be marked as "Electrical Shunt Trip" with a metal tag of 1/2" letters. The shunt trip device shall not be self-resetting.
9. When sprinklers are provided in the hoistway, all electrical equipment located less than 4'-0" above the pit floor shall be identified for use in wet locations. The exception is seismic protection devices.
10. Provide smoke detectors in elevator machine room and all enclosed elevator lobbies. Smoke detectors shall be installed in accordance with NFPA 72, Chapter 5-3. Signals shall be a normally closed electrical contact from the smoke detectors and shall terminate at the elevator controller. Wiring in elevator hoistway and machine room shall be enclosed in conduit. Smoke detectors shall activate elevator recall-Phase I-firefighters' service. Provide four separate signals from the following smoke detector locations:
 - a. One signal from all elevator lobbies and the elevator machine room smoke detectors, except the main floor recall lobby smoke detector.
 - b. One signal from the main floor recall lobby smoke detector.
 - c. One signal from the machine room smoke detector.
 - d. One signal from the top of hoistway smoke detector.
11. Fire alarm initiating devices in each elevator lobby for each group of elevators or single elevator and each machine room to initiate firefighters' return feature. Device at top of hoistway if sprinklered. Provide alarm initiating signal wiring from hoistway or machine room connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters' operation.
12. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room and/or main control console. Size, number, and location of conduits shall be coordinated with the elevator installer.
13. Proper elevator machine room area lighting shall provide a minimum of 19 FTC at all areas of the machine room floor level. Provide adequate number of LED lighting fixtures. Provide guards on all light bulbs. Vertical clearance from elevator machine room floor to the underside of all lighting fixtures, including guards, shall not be less than 7'-0". Required lighting shall not be connected to the load side terminals of the ground-fault circuit-interrupter receptacles. Light switch shall be located on the lock-jamb side of elevator machine room access door.
14. Provide a minimum of 10 FTC at all pit floor areas. Pit light switch shall be located adjacent to top of pit ladder. Provide at least two LED fixtures. Light bulbs shall be guarded to prevent contact and accidental breakage. Fixtures shall be located at least 24 inches vertically from the pit floor. Required lighting shall not be connected to the load side terminals of the ground-fault circuit-interrupter receptacles.
15. Provide separate branch circuit for the duplex receptacle-15A-120 VAC in elevator machine room. Provide the GFCI protection. Locate below the elevator machine room light switch.
16. Provide separate circuit GFCI electrical outlet for hydraulic oil cooling unit.

17. In addition to the cooling unit receptacle, provide another separate GFCI branch circuit duplex receptacle rated-15A-120 VAC in each elevator pit.
18. Separate phone line to elevator controller. All wiring in elevator machine room shall be enclosed in electrical conduit. Terminate phone line on side of each elevator controller in a 2" x 4" electrical box with cover plate. Provide a minimum of 3 feet of phone line in box. Phone line will be provided by the Port.
19. Coordination of card reader security system and connection junction box in machine room required.
20. Future camera connection junction box in machine room.
21. Temporary power and illumination to install test and adjust elevator equipment.
22. Provide a minimum of 10 FTC at each elevator lobby at elevator door threshold. Measurement shall be taken at each hoistway door landing sill area.

Hydraulic Elevators Only:

1. Single-phase power feeder to each elevator controller in machine room with protected lockable "open" disconnecting means for oil cooler unit.
2. Three-phase power feeder to each freight elevator power door controller in machine room with protected lockable "open" disconnecting means.

STANDBY POWER PROVISION

1. Standby power of normal voltage characteristics via normal electrical feeders to run one elevator at a time at full-contract car speed and capacity.
2. Conductor from auxiliary form "C" dry contacts, located in the standby power transfer switch to a designated elevator control panel in each elevator group and/or single elevator unit. Provide a time delay of 30-45 seconds for pre-transfer signal in either direction.
3. Standby single-phase power to group controller, and each elevator controller for car lighting, exhaust blower, emergency signaling device, intercom amplifier, car heating, and air conditioning unit.
4. Standby power to machine room, and pit lighting.
5. Standby power to machine room ventilation or air conditioning.
6. Standby power to emergency communications devices.

ESCALATORS

1. Clear and plumb wellway.
2. Floor pockets and/or structural beams for support of escalator truss at each end and at intermediate locations. Steel supports, if used, shall meet deflection requirements of AISC Specifications for Design, Fabrication, and Erection of Structural Steel for Buildings.
3. Patching and finishing around escalator landing plates after installation.
4. Cladding and finishing of exposed truss surfaces.
5. Waterproof pit.
6. Fire sprinklers in wellway, per local code requirement with protective guards.
7. LED light with guard and CFGI convenience outlet in each pit and machine room space.
8. Three-phase mainline copper power feeder to terminals of each escalator controller with protected, lockable "open," disconnect switch.
9. CAT 6 line to each escalator controller in moving walk machine space.
10. Fire alarm initiating devices in each escalator pit. Provide alarm initiating signal wiring from connection point to escalator controller terminals. Device shall provide signal for general alarm and interruption of escalator operation.

11. Provide a CCTV camera at each end of the escalator. The camera shall be mounted to provide a view of the walk-on or walk-off landing plates at the center line of the unit. Both cameras shall be capable of viewing from the landing plate to the center of the unit in each direction. Cameras shall be integrated into the Port's CCTV camera system.

MOVING WALKS

1. Clear, plumb, wellway with variations not to exceed 1 inch at any point.
2. Floor pockets and/or structural beams for support of moving walk truss at each end and at intermediate locations. Steel supports, if used, shall meet deflection requirements of AISC Specifications for Design, Fabrication, and Erection of Structural Steel for Buildings.
3. Fire-rated enclosure of moving walk truss including ends, sides, and bottoms.
4. Patching and finishing around moving walk landing plates after installation.
5. Cladding and finishing of exposed truss surfaces.
6. Waterproof pit.
7. Fire sprinklers in wellway, per local code requirement with protective guards.
8. LED light with guard and CFGI convenience outlet in each pit and machine room space.
9. Three-phase mainline copper power feeder to terminals of each moving walk controller in the machine room space with protected, lockable "open," disconnect switch.
10. CAT 6 line to each moving walk controller in moving walk machine space.
11. Fire alarm initiating devices in each moving walk pit. Provide alarm initiating signal wiring from connection point to moving walk controller terminals. Device shall provide signal for general alarm and interruption of moving walk operation.
12. Provide a CCTV camera at each end of the moving walk. The cameras shall be mounted to provide a view of the walk-on or walk-off landing plates at the center line of the unit. Both cameras shall be capable of viewing from the landing plate to the center of the unit in each direction. Cameras shall be integrated into the Port's CCTV camera system.