

SECTION 14265 - ELECTRIC FREIGHT ELEVATOR CONSTRUCTION STANDARD

PART 1: GENERAL

1.01 Summary

Section Includes:

1. Electric traction freight elevator system.
2. Passenger cab, interior finishes, control panel and facings including cab doors.
3. Fire rated hoistway doors, sills, and frames.
4. Guide rails and brackets, hoisting cables, brake, safety and governor, and counterweights.
5. Pit buffers.
6. Motors, variable voltage variable frequency drive, microprocessor type control system, power supply, and accessories.

1.02 Related Sections:

1. Construction Facilities and Temporary Controls: Temporary power supply.
2. Cast-in-Place Concrete: Reinforced concrete shafts.
3. Unit Masonry System: Masonry for fire rated shafts and hoistway openings.
4. Structural Steel: Structural hoist, divider, and sheave beams and other steel items.
5. Metal Fabrications: Pit ladder and accessories.
6. Plumbing Fixtures: Pit drainage.
7. Panelboards: Electrical power to the machine room including main switch and breaker. Heat and smoke sensing devices.

1.03 Work Required by Other Sections:

1. The contractor shall coordinate all work required by latest applicable codes including fire and smoke rated hoistway enclosures, pits, shaft venting, operable fire alarm systems, etc.

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2. The machine room shall be enclosed and conditioned per the elevator manufacturer's required tolerances and have temporary power available for installation work.
3. Crane service shall be provided for the hoisting of the machine room equipment.
4. All structural beams and rails shall be in place.
5. The elevator pit shall include ladder, guarded light, GFI receptacle and sump pump with cover. Light and pump shall each be on separate dedicated circuits.
6. The elevator controls shall include two inputs from the emergency electrical system. One input shall be from a set of Form C contacts, which shall change state when electrical system has switched to emergency operation. A second input shall be from a set of normally open contacts, which shall close 0-50 seconds prior to any controlled change of the emergency electrical system and shall open after the change. This input shall be designated as the pre-transfer signal.

1.04 References

1. American Architectural Manufacturers Association (AAMA):
 - a. AAMA 607.1: Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
2. American Society of Mechanical Engineers (ASME):
 - a. A17.1: Safety Code for Elevators.
 - b. A17.2.1: Inspector's Manual For Elevators.
3. American Plywood Association (APA): Product Guide-Grades and Specifications.
4. American Society for Testing and Materials (ASTM):
 - a. A36: Structural Steel.
 - b. A167: Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
 - c. A325: High Strength Bolts for Structural Steel Joints.
 - d. A446: Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
 - e. A480: General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
 - f. A490: Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.

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- g. A500: Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
 - h. A501: Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - i. A525: Steel Sheet, Zinc Coated (Galvanized) by Hot Dip Process, General Requirements.
 - j. B138: Manganese Bronze Rod, Bar, and Shapes.
 - k. B209: Aluminum-Alloy Sheet and Plate.
 - l. B221: Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
 - m. C1048: Heat Treated Flat Glass-Kind HS, Kind FT, Coated and Uncoated Glass.
5. National Electrical Manufacturer's Association (NEMA):
- a. FS L-P-508: Plastic Sheet, Laminated, Decorative, and Nondecorative.
 - b. LD-3: High Pressure Decorative Laminates.
 - c. MG1: Motors and Generators.
 - d. PS-1: Construction and Industrial Plywood.
6. National Fire Protection Association (NFPA):
- a. NFPA 70: National Electrical Code.
 - b. NFPA 80: Fired Doors and Windows.
7. Americans with Disabilities Act: Texas Accessibility Standards.
8. Other:
- a. MIL-L-1914: Lumber and Plywood, Fire Retardant Treated.
 - b. AWS D1.1: Structural Welding Code.
 - c. AISC-Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.
 - d. ANSI/IEEE 519: Electrical harmonic requirements.

1.05 System Description

1. Characteristics of Elevator No. (#) as follows:
- a. Type: Electric geared traction. (Select One: Top mounted machine room or Offset mounted machine room.)
 - b. Control: Microprocessor based static type that is software oriented. The system shall operate in real time and continuously analyze each car's changing position, condition, and workload. Suitable sensors shall be included within the elevator system to input the correct data to the controller. Inputs to be considered include car loading, position, and motion. The controller's capabilities shall allow for determination of optimum travel time of each elevator with all cars

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and calls being considered. The microprocessor shall consider all traffic patterns. The control shall include anti-nuisance type detection and operating measures.

- c. Power Characteristics: For elevator drive apparatus: (##) HP, 480 Volt, three-phase 60 Hz. For lighting: 120 Volt, 60 Hz.
- d. Drive System: Variable voltage variable frequency (VVVF).
- e. Rated Net Capacity: (#####) lbs. (#####kg).
- f. Rated Speed: (###) ft/min (.##m/s).
- g. Loading Class: "A".
- h. Car Interior Dimensions: (#'-#") wide x (#'-#") deep. (#'-#") height
- i. Landing entrances:
 - 1. Size: (#'-#") wide by (#'-#") high.
 - 2. Type: Vertical bi-parting, power operated.
 - 3. Construction: Welded type.
 - 4. Material: Steel prime and painted.
 - 5. Truckable sill on lower panel.
- j. No. of Stops: Number (#) stops; Travel distance: (##'-#").
- k. No. of Openings: Number (#); (#) at front and (#) at rear.

2. Operation (Select one):

- a. Simplex Collective.
- b. Duplex Collective.
- c. Group microprocessor controlled demand allocation.

3. Car Gate and Hoistway Door Control Features:

- a. Individual electric operators shall open and close the hoistway doors and car gate at a panel speed of not more than one foot per second without slamming. Limit switches shall be provided to stop the operator motors as the doors approach the limit of travel in opening.
- b. Provisions shall be made for the manual operation of the doors from the car in the event of a power failure.
- c. The door operators shall be arranged to open the door automatically after the car enters the automatic leveling zone at the designated landing.
- d. Each door shall use dual motors.
- e. Provide automatic closing operation, which shall close the gate and door after a field adjustable period of time. Prior to automatic closing, an audible pre-closing signal shall sound to warn the operator. The audible signal shall be accomplished with a solid-state toner. Bells are not acceptable.
- f. Door Safety Devices: soft, mechanical safety edges, quiet in operation, with non-contact reversing light ray. Peelle or Owner approved equivalent. Gates shall be provided with passenger sequence operation.
- g. Door Operators: Individual electric operators.

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4. Hall lanterns shall operate to correspond with next direction of travel. When responding to hall call, lantern shall operate to correspond with direction of call being answered.
 5. Electric limit switches shall be placed in the hoistway near the terminal landings and be designed to cut off the electric current and stop the car should it run beyond either terminal landing.
 6. The elevator shall be provided with a self-leveling feature that will automatically bring the car to the floor landings. This feature shall be entirely automatic and independent of the operating device and shall correct for overtravel or undertravel. The car shall be maintained level with the landing irrespective of the load.
 7. Interconnect elevator control system with building emergency electrical supply.
- 1.06 Fireman's Service
1. Provide "Firefighter's Operation" in accordance with the latest ASME A17.1.
 2. Designated Landing: Egress Floor.
 3. Seismic Design: In accordance with applicable code.
- 1.07 Emergency Electrical Operation
1. Interconnect elevator control system with building fire alarm, and smoke alarm system.
 - a. In the event of a normal power failure, the elevator system shall be designed to operate from the emergency electrical supply. The elevator controls shall receive an input indicating that the electrical supply is from the emergency source. The elevator controls shall then allow one unit at a time to be lowered to the egress level, open the doors, and become inactivated.
 - b. After all of the elevators have been lowered and become inactivated, one selected unit shall resume operation on the emergency electrical system. In the event that the selected unit fails, after a set time delay the next elevator in line shall assume operation.
 - c. The elevator controls shall include two inputs from the emergency electrical system. One input shall be from a set of (Form "C") contacts, which shall change state when the electrical system has switched to emergency operation. A second input shall be from a set of normally open contacts, which shall close 0-50 seconds prior to any controlled change of the emergency electrical system and shall open after the change. This input shall be designed as the pre-transfer signal. This may not be used at any time of installation of the equipment but must be available for future use.

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- d. Once normal power is restored, the elevator controls shall return all units to normal operation.

1.08 Submittals for Review

Submit under provisions established in the project specifications, Division One requirements:

1. Provide a signed copy of The University of Texas ENVIRONMENTAL HEALTH AND SAFETY CONSTRUCTION SITE PROCEDURES FOR CONTRACTORS, prior to commencement of any work.
2. Shop Drawings: Include following information:
 - a. Motor, brake, drive system, valves, controller, selector, governor, and other component locations.
 - b. Car, machine beams, guide rails, buffers, wire ropes, counterweights and other components in hoistway.
 - c. Rail bracket spacing and maximum loads imposed on guide rails requiring transfer to structure.
 - d. Individual weight of principle components and load reactions at points of support.
 - e. Loads on hoisting beams.
 - f. Clearances and over travel.
 - g. Locations of components in machine room. Show arrangement so that moving elements and other equipment can be removed for repairs without disturbing other components. Arrange equipment for clear passage through doors and access doors.
 - h. Location in hoistway and machine room of connections for car light and telephone.
 - i. Locations of access doors, doors, and frames.
 - j. Expected heat dissipation of elevator equipment in machine room.
 - k. Electrical characteristics and connection requirements.
3. Samples: Illustrate cab interior finishes and car and hoistway door and frame finishes.

1.09 Submittals at Project Close-out

1. Contract Close-out: Procedures for submittals.
2. Furnish two copies of bound maintenance manuals for each elevator. Include full maintenance and operating instructions, parts list, recommended spare parts, emergency parts inventory, sources of purchases and wiring diagrams.

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3. Include legible schematic of all wiring diagrams of installed electrical equipment and changes made in the work. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
4. Provide two copies of master electric schematics and one copy of lubrication chart.
5. Tools, electrical prints, parts catalogs, keys, door keys, protective cab pads and other proprietary components shall be turned over to The University of Texas Utilities Service Elevator Inspection Department, upon final inspection of the elevator.

1.10 Quality Assurance

1. Perform Work in accordance with the latest ASME A17.1, AWS D1.1, NFPA 70, AISC, and as supplemented in this section.
2. Fabricate and install door and frame assemblies in accordance with NFPA 80 and UL 10B.
3. Qualifications:
 - a. Contractor:
 1. Maintain a warehouse and maintenance service in the City of Austin, Texas.
 2. Minimum (5) years, prior to bid date of this project, in the business of providing elevator service and having warehouse facilities.
 3. Maintain in Austin, Texas an adequate stock of parts for emergency and replacement purposes.
 4. Qualified personnel available at Austin, Texas to insure fulfillment of maintenance and/or repair service on a 24-hour emergency call basis.
 - b. Installer: Employees and supervisor on payroll of elevator equipment manufacturer.
 - c. Equipment: Manufactured and guaranteed by the selling company; manufactured in its entirety (exclusive of cabs and doors) by the designer and manufacturer.
 - d. Parts, accessories, and appurtenances: Erected, installed, adjusted, tested and placed in operation by competent mechanics skilled in this work and under the direct control and supervision of the Installers experienced foreman.

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1.11 Regulatory Requirements

1. Conform to the latest ASME A17.1 code for manufacture and installation of elevator system.
2. Conform to State of Texas Accessibility Standards for provisions for the disabled.
3. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc.

1.12 Warranty

1. Contract Close-out.
2. Correct defective Work within a one-year period after Date of Substantial Completion.
3. Warranty: Include coverage for elevator operating equipment and devices.

1.13 Maintenance Service

1. Contract Close-out.
2. Provide service and maintenance of elevator system and components for Ninety Days (90) from Date of Final Acceptance of last elevator.
3. Examine system components Semi-monthly. Clean, adjust, and lubricate equipment.
4. Include systematic examination, adjustment, and lubrication of elevator equipment. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.
 - a. Include monthly Fire Service and emergency light Inspections and test.
 - b. Include elevator cab handrails.
5. Perform work without removing cars during peak traffic periods.
6. Maintain in Austin, Texas an adequate stock of parts for replacement or emergency purposes. Have personnel available to ensure the fulfillment of this maintenance service on a 24-hour emergency call basis for this maintenance period.

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7. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer.
8. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

1.14 Extra Materials

1. Contract Close-out.
2. Supply three extra keys for each keyed switch.
3. Supply hand held computer and other components necessary to test and maintain elevator and equipment. Include updates or modifications of test equipment for 10 years.

PART 2: PRODUCTS

2.01 Manufacturers

1. Contract Documents are based on (List Model #) by (List Company).
2. Equivalent products by the following are acceptable:
 - a. Motion Control Engineering
 - b. Thyssen/Dover
 - c. KONE Inc.
 - d. Tejas Elevator
 - e. United Technologies Otis Elevator Company.
 - f. Schindler Elevator Corp.
 - g. Elevator Products Corp
 - h. Innovation Industries Corp
 - i. Hollister Whitney Elevator Corp.
 - j. PTL Car & Hall Fixtures
 - k. Owner approved equal.
3. Substitutions: Under provisions established in the project specifications, Division One requirements:

2.02 Materials

1. Steel:
 - a. Shapes: ASTM A 36, ANSI A17.1.
 - b. Sheet: ASTM A 446, galvanized, stretcher leveled, Commercial Grade.

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2. Stainless Steel: ASTM A 167, Type 302 or 304, No. 4 satin/brushed finish.
3. Aluminum: Anodizing quality.
 - a. Extrusions: ASTM B 221.
 - b. Sheet: ASTM B 209, alloy 6063.
4. Plywood: APA Structural I, Grade C-D, sanded.
5. Plastic Laminate: NEMA LD-3, General Purpose Type.
6. Paints:
 - a. Primer for steel: Red Oxide.
 - b. Primer for wood: Alkyd primer/sealer.
 - c. Enamel: Semigloss alkyd.

2.03 Components

1. Shall include motors, brake, counterweight guides and guide shoes, ropes, cables, sheaves, counterweights, safety and governor, controller, controls, buttons, rails, wiring as required by NFPA 70, devices, and indicators. Component parts shall be individually specified below.
2. The machine shall be a geared traction type with motor, brake and traction drive. Sound isolation pads shall be mounted beneath the bedplates.
3. The motor shall be of a design suitable for the anticipated traffic and be rated for a high starting torque and low starting current. The motor shall be suitable for use with a variable voltage variable frequency type system and shall meet ANSI 519 requirements for electrical harmonic distortion.
4. The brake shall be spring applied and electrically released.
5. The elevator shall be provided with automatic self-leveling to a tolerance of (+/-) 1/4 inch and shall correct for travel variations and rope stretch.
6. The elevator shall have an overspeed governor and brake system.
7. Operational Controller:

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- a. Motion Control Engineering (**MCE**) **Only**. Controller shall be NEMA 1
 - b. Drive Control: (Select one):
 1. PTC
 2. IMC
8. Landing System: Shall be compatible with MCE controller (Select One):
- a. (LS-QUTE) up to 300 fpm
 - b. (LS-QUAD) over 300

2.04 Electrical System Characteristics

1. Electrical Characteristics:
 - a. 480 volts, three-phase, 60 Hz.
 - b. Motor Drive Characteristics:
 1. Variable voltage variable frequency system shall allow for soft start type operation.
 - c. Refer to Division 16, - Equipment Wiring Systems: Electrical connections.

2.05 Electrical Components

1. Boxes, Conduit, Wiring, and Devices: Required by NFPA 70 and under provisions of Division 16.
2. Fittings: Steel compression type for electrical metallic tubing. Fittings with set screws are acceptable only when a separate grounding conductor is also installed across the joint.
3. Spare Conductors: Include 10 percent extra conductors and two pairs of shielded audio cables in traveling cables. Do not parallel conductors to increase electric current capacity unless individually fused.
4. Do not use armored flexible metal conduit as a grounding conductor.
5. Include wiring and connections to elevator devices remote from hoistway and between elevator machine rooms. Provide additional components and wiring to suit machine room layout.
6. All labeling required by ASME A.17.1 shall be permanently engraved/embossed and permanently affixed plaques. Plaques may be

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either plastic laminate or metallic. **“Permanent Marker” or “Labeling Tape” ID’s shall not be used.**

2.06 Machine

1. The machine shall be a single worm geared traction type with motor, brake, gearing and driving sheave mounted in the proper alignment on a steel bedplate. Sound isolation pads shall be mounted beneath the bedplates.
2. The worm shall be of hardened and ground steel, integral with the worm shaft, and shall be provided with a ball or roller thrust bearing designed to take the end thrust of the worm in both directions.
3. The ring gear shall be hobbled from a bronze rim, which shall be accurately fitted and bolted to the gear spider.
4. The sheave and gear shall be supported by heavy-duty ball or roller bearings. The roller and anti-friction metal bearings shall be provided with an adequate means of lubrication.

2.07 Motor

1. The motor shall be rated A. C., NEMA code letter “G” or as required for the torque and duty requirements. The motor shall be suitable for use with a variable voltage variable frequency type drive.
2. The motor shall be totally enclosed non-ventilated with a class F insulation rating.
3. The armature shall be dynamically balance and supported by ball bearings of adequate capacity.

2.08 Drive Control

1. The elevator drive shall be supplied a variable voltage variable frequency supply from a vector controlled pulse-width modulated alternating current motor drive.
2. The speed control shall be by means of a vector control providing independent excitation and torque current. A digital velocity encoder shall be provided on the motor giving feedback to the controller on motor speed and position.

2.09 Brake

1. The electric brake shall be spring applied. The controller shall actuate the brake and allow smooth, positive stops. The brake shall be designed for automatic application in the event of power supply failure.

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2.10 Ropes

1. Provide suitable traction steel hoist ropes of size and number to insure proper wearing qualities.
2. Adequate compensation for weight of hoist ropes to be furnished when required to maintain proper counterbalance ratio.
3. Governor ropes shall be iron.

2.11 Counterweights

1. Each elevator shall be suitably counterbalanced for smooth and economical operation. Cast iron or steel plate weights shall be contained in a structural steel frame.
2. The counterweight shall be equal to the complete elevator car and approximately 40% of the specified load.

2.12 Safety and Governor

1. The car safety shall be mounted on the bottom members of the car frame and shall be operated by a centrifugal speed governor located over the hoistway. The governor shall be designed to cut off power to the motor and apply the brake whenever the governor indicates the car has excessive speed.

2.13 Lubrication

1. Grease Fittings: For lubricating bearings requiring periodic lubrication.
2. Lubrication Points: Visible and easily accessible.

2.14 Car Structural Fabrication

1. Frame: Fabricated steel frame of formed or structural steel shapes, gusseted and rigidly welded.
2. Platform: Aluminum checkered plate, 1/4" thick laid over steel stringers and subflooring. The platform shall be completely isolated from the car sling and bracing members by vibration absorbing materials.
3. Sling: Shall consist of heavy steel stiles, properly affixed to a steel crosshead and safety channels with adequate bracing members to remove all strain from the car enclosure.

2.15 Cab Fabrication

1. Cab Design:

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- a. Cab Size: Platform (#'-#")X(#'-#") Floor to ceiling (#'-#").
- b. Flooring: Aluminum checkered plate, 1/4" thick.
- c. Car Gate: Single Blade, expanded metal, power operated.
- d. Sides and rear: Rigidized (stainless steel) (steel) panels with (diamond pattern) (14 gauge steel).
- e. Ceiling: Baked enamel on 14-gauge steel.
- f. Ventilation: 2 speed blower mounted above ceiling, with grille.
- g. Lighting: Fluorescent with solid lens diffuser.
- h. Controls and fixtures:
 1. Operating panel flush mounted vandal resistant in side wall.
 2. Telephone Flush mount.
 3. Car position indicator.
 4. Emergency light mounted above car operating panel.
- i. Provide stainless steel license holders for display of required certificates. Design the holder to use non-visible tamper-proof fastenings. Holder shall enclose an 8 1/2" x 11" sign.

2.16 Car Operating Panel

1. Provide one flush mounted vandal resistant operating panel containing illuminated car buttons corresponding to floors served, in car alarm button, and DOOR OPEN, DOOR CLOSE buttons. Constant pressure on the CLOSE button shall close the door. Momentary pressure on the OPEN button shall re-open the door, provided the car is at a landing.
2. Position alarm button and emergency stop switch not less than 35 inches above cab floor where it is unlikely to be accidentally actuated. Emergency stop, push-pull or toggle type shall activate alarm or bell when operated.
3. Mounted In Car Operating Panel
 - a. Independent service switch (key operated).
 - b. Fan or blower switch (key operated).
 - c. Light switch (key operated).
 - d. Emergency light mounted above car operating panel.
 - e. ADA Flush mounted telephone; Wurtec Inc. Cat. 11-582-van, or owner approved equal.
 - f. Additional operating switches for the special features specified.
 - g. Elevator identification number, 1/2 inch high, engraved and filled. Locate at top of panel.
4. Locate a 110 V, 15 Amp GFI convenience receptacle in car panel.

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5. DOOR HOLD OPEN PUSH BUTTON to be included. When activated by momentary pressure, the doors shall remain open for an adjustable period of time (1-180 seconds). This extended door open time will be canceled by activation of the DOOR CLOSE button. This circuit shall be rendered inoperative during Fire Service.

2.17 Car and Counterweight Guides And Guide Shoes

1. Guides for the car and counterweight shall be planed steel guide rails, properly fastened to the building structure with steel brackets.
2. Roller guides, consisting of a minimum of three tires, shall be mounted on the top and bottom of the car and counterweight frame, and shall be held in contact with the guide rail by adjustable devices. Roller guides shall run on dry, unlubricated rails.

2.18 Car Top Inspection Station

1. Provide station device to operate each elevator from on top of the car during adjustment, inspection, maintenance, and repair.
2. Operating means shall conform to the following:
 - a. Device shall be of the continuous-pressure type; operate the car at a speed not exceeding 150 ft/min; operate the car subject to the electrical protective devices required by ASME A17.1 Rule 210.1d.
3. Device shall be used only for the purpose of adjustment, inspection, maintenance, and repair of the elevator or hoistway equipment.
4. Provide each elevator with an electric light protected with a guard and a GFI convenience outlet fixture on the car top.

2.19 Cab Entrances

1. Car Gate: Single Blade expanded metal, power operated, 6'-0" height. With standard returns.
2. Gates shall be provided with soft mechanical safety edge and a non-contact reversing edge, Peelle or Owner approved equivalent, and with passenger sequence operation.

2.20 Accessibility Provisions

1. Comply with applicable code.

2.21 Hoistway Entrances

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1. Hoistway Doors shall be Peelle doors (OR OWNER APPROVED EQUIVALENT) Prime painted steel vertical bi-parting; 0.058 inch ([1.5 mm) thick metal, of insulated sandwich panel construction, flush design, rolled profiles, rigid construction, 4''x12'' tempered glass vision panel.
2. Hoistway Door Frames: Steel channel specified under provisions established in project specifications, Division Two requirements.
3. Door Construction: 1-1/2 hour fire rating; insulated sandwich panel door construction 1-1/4 inch (32mm) thick, minimum; Truckable sill on lower door panel.
4. Sills: Steel edge angle specified under provisions established in project specifications, Division Two requirements.

2.22 Landing Controls

1. Landing Buttons: Vandal-resistant stainless steel Illuminating type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows, including indications required by ASME A17.1. Hall button covers to be engraved and filled with pictograph detailing "In case of fire use stairs". Accepted alternate "Cast Appendix H" inset to face plate as manufactured by Stencil Cutting & Supply Company.
2. DOOR OPEN, DOOR CLOSE buttons. Vandal-resistant type. Constant pressure on the CLOSE button shall close the door. Momentary pressure on the OPEN button shall re-open the door, provided the car is at a landing.
3. Screws: All screws to be pin in hex tamper proof.

2.23 FINISHES

1. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime and paint.
2. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
3. Galvanized Surfaces: Clean with neutralizing solvent; prime one coat.
4. Aluminum: Mill finish.
5. Wood Surfaces not Exposed to Public View: One coat primer; one coat enamel.

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6. Stainless Steel: #4 Satin.

PART 3: EXECUTION

3.01 Site Inspection

1. Examine work of other Sections that affects the Elevator System. Report defects that will affect equipment or system operation to the Architect/Engineer.
2. Before fabrication, take job site measurements and verify that Work Required by Others is complete. Check measurement of space for equipment and means of access for installation and operation.

3.02 Installation

1. Install in accordance with ASME A17.1, manufacturer's instructions, and applicable codes.
2. Arrange equipment in machine room so that elements requiring removal or maintenance are readily accessible without disturbing other components. Arrange for clear passage between components.
3. Set all hoistway entrances in vertical alignment with car openings and true with plumb sill lines.
4. Install machinery, guides, rails, controls, car and all equipment and accessories to provide for a quiet, smooth operation free of sideways movement, oscillation or vibration.
5. Mount machine directly over hoistway on steel beams or (mount machine adjacent to shaft with transfer pulley over opening). Isolate and dampen vibration with properly sized sound-reducing anti-vibration pads.
6. Erect hoistway sills, headers and frames prior to the erection of rough walls and doors; erect fascias and toe guards after rough walls are finished.
7. Grout sills and hoistway entrance frames.
8. Clean field welds; remove oxidation and residue. Apply touch up primer.
9. Connect equipment to building utilities.

3.03 Erection Tolerances

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1. Quality Control: Tolerances.
2. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.1.
3. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

3.04 Field Quality Control

1. Quality Control: Field inspection, testing, adjusting, and balancing.
2. Perform tests required by ASME A17.1 and ASME A17.2.1.
3. Test elevator in presence of Owner and Architect to ensure proper operation and compliance with specified requirements; make final adjustments as appropriate.
4. Obtain inspections and permits and make such tests as are required by governing authorities. Deliver test certificates and permits to Owner.
5. Provide two weeks written notice of date and time of tests.
6. Supply instruments and execute specific tests.

3.05 Tests By Regulatory Agencies

1. QEI Certified Testing in accordance with ASME A17.1 will be performed by Owner.

3.06 Adjusting

1. Contract Close-out: Adjusting installed work.
2. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
3. Adjust automatic floor leveling feature at each floor to achieve (+/-) 1/8 inch (3mm) from floor level.

3.07 Cleaning

1. Contract Close-out: Cleaning installed work.
2. Remove protective coverings from finished surfaces.
3. Clean surfaces and components ready for inspection.

3.08 Protection of Finished Work

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1. Contract Close-out: Protecting installed work.
2. Do not permit construction traffic within cab after cleaning.

END OF STANDARD 14265