

SECTION 14280 - ESCALATORS
CONSTRUCTION STANDARD

PART 1: GENERAL

1.01 Escalator Preparatory Work:

1. Preparatory work is not included in the escalator contract.
2. To complete the escalator installation, the following work must be performed or furnished by contractors other than the escalator subcontractor, according to governing codes. These conditions include the following:

1.02 Work Included:

1. Section Includes:
 - a. Complete furnishing and installation of electric escalators, including their associated superstructure, side balustrades and components.
 - b. Escalator machinery support system, and pit enclosure.
 - c. Motors, controls, wiring and connection to the main switch panel.
2. PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION:
 - a. Cast-in-place Concrete: Reinforced concrete building openings
 - b. Structural Steel: Placement of steel bearing plates, angles, and anchors for installation and other steel items.
 - c. Metal Fabrication: Miscellaneous steel angles, brackets and accessories.
 - d. Panelboards: Electrical power to machine pit including main switch and breaker.
3. Related Sections:
 - a. Construction Facilities and Temporary Controls: Temporary power supply.
 - b. Cast-in-Place: Framed concrete openings for escalator.
 - c. Structural Steel: Structural steel floor opening framing. Structural steel bearing support.
 - d. Raceways: Empty conduit to equipment devices remote from machine pit.
 - e. Wiring Devices:
 1. Electrical characteristics and wiring connections.
 2. Electrical service to main disconnects in machine pit at upper end of truss for lights and drive motor including electrical power for escalator installation and testing.

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3. Electrical disconnecting device to equipment prior to activation of sprinkler system.
4. Electrical service for machine pit, machine pit convenience outlet, and other electrical accessories.
5. Lighting in machine pit.

4. Work Required by Other Sections:

- a. The contractor shall coordinate all work required by applicable codes including fire and smoke rated hoistway enclosures, pits, shaft venting, operable fire alarm systems, etc.
- b. The machine room shall be enclosed per the escalator manufacturer's required tolerances and have temporary power available for installation work.
- c. Crane service shall be provided for the hoisting of the machine room equipment.
- d. All structural beams and rails shall be in place.
- e. The escalator pit shall include guarded light, GFI receptacle and emergency stop switch to prevent the escalator from running.

1.03 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 and Escalators.
 - b. A17.2.3: Inspector's Manual For Escalators.
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.

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- f. A490: Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.
- 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. 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.

1.04 System Description:

- 1. A total of (insert number) escalators shall be provided. The escalators system shall be provided as a pair. One up and one down at each level.
- 2. The plans, drawings and details are based on (Manufactures Name) Escalator system and components. The final details shall be coordinated with the selected and approved escalator system.
- 3. Characteristics of each escalator are as follows:

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- a. Quantity: [Specify]
- b. Unit Identification: [Specify] escalator building number
- c. Floors Served: [Specify]
- d. Speed: Escalator(s) shall ascend and descend at [Select one of the following]:
 1. 90 feet/minute (0.48 M/sec.)
 2. 100 feet/minute (0.51 M/sec.)
- e. Vertical Rise: [Specify feet and inches]
- f. Step Width: [Specify one]
 1. 24 inches (610 mm)
 2. 32 inches (810 mm)
 3. 40 inches (1016 mm)
- g. Power Supply: [Specify Volts]/3 Phase/60 Hertz

1.05 Operation:

1. Operation: Constant speed under light to heavy load conditions in either direction, transit speed of handrail same as treads.
2. Switching: Key operated “On/Off” and reversing direction, control and emergency “Stop” buttons located at each end of unit.
3. Machine and Drive: A/C motor, worm gear drive, and electromagnetic brake.

1.06 Submittals:

1. Submit under provisions established in the project specifications, Division One requirements:
 - a. Shop Drawings: Include following information:
 1. Motor, brake, drive system, controller, governor, and other component locations.
 2. Machine and supporting components.
 3. Support bracket spacing; maximum loads imposed requiring load transfer to building structural framing.
 4. Individual weight of principle components and load reactions at points of support.
 5. Loads on hoisting beams.
 6. Clearances.
 7. Locations of components in machine room, arrangement so that moving elements and other equipment can be removed

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for repairs without disturbing components. Arrange equipment for clear passage through access door.

8. Location in hoistway and machine room of connections for machine and lights.
9. Locations of access doors, doors, and frames.
10. Expected heat dissipation of escalator equipment in machine room.
11. Electrical characteristics and connection requirements.

2. Product Data: Provide data on the following items:

- a. Signal and operating fixtures, operating panels, indicators.

1.07 Submittals At Project Close-out:

1. Contract Close-out: Procedures for submittals.
2. Furnish two copies of bound maintenance manuals for each escalator. Include full maintenance and operating instructions, parts list, recommended spare parts, emergency parts inventory, sources of purchases and wiring diagrams.
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. Provide one copy of master electric and one copy of lubrication chart.

1.08 Quality Assurance:

1. Perform Work in accordance with ASME A17.1, AWS D1.1, NFPA 70, AISC, and as supplemented in this section.
2. 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 escalator service and having warehouse facilities.
 3. Maintain in Austin, Texas an adequate stock of parts for emergency and replacement purposes.

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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 escalator equipment manufacturer.

c. Equipment: Manufactured and guaranteed by the selling company; manufactured in its entirety 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.

1.09 Regulatory Requirements:

1. Conform to ASME A17.1 code for manufacture and installation of escalator 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.

1.10 Warranty:

1. Contract Close-out.

2. Correct defective Work within a one-year period after Date of Substantial Completion.

3. Warranty: Include coverage for escalator operating equipment and devices.

1.11 Maintenance Service:

1. Contract Close-out.

2. Provide service and maintenance of escalator system and components for Ninety- (90) Days from Date of Substantial Completion.

3. Examine system components semi-monthly. Clean, adjust, and lubricate equipment.

4. Include systematic examination, adjustment, and lubrication of escalator equipment. Repair or replace parts whenever required.

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Use parts produced by the manufacturer of the original equipment.

5. Provide emergency call back service during working hours during this maintenance period.
6. Perform maintenance work using competent personnel, under the supervision and in the direct employ of the escalator manufacturer.
7. Perform work without removing escalator during peak traffic periods.
8. 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.
9. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

1.12 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 escalator 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).

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2. Equivalent products by the following are acceptable:
 - a. Dover Corporation-Elevator Division
 - b. Montgomery Kone Inc.
 - c. United Technologies Otis Elevator Company.
 - d. Schindler Elevator Corp.
 - e. Owner approved equal.
 3. Substitutions: Under provisions established in the project specifications, Division Two requirements.
- 2.02 Materials:
1. Steel:
 - a. Shapes: ASTM A 36, ANSI A17.1.
 - b. Sheet: ASTM A 446, galvanized, stretcher leveled, Commercial Grade.
 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. Structural Steel Components: Truss frame and end bearing plates, tracks, attachment brackets, and anchors.
 2. Cast or Extruded Aluminum Components: Ribbed moving treads with ribbed risers and comb step/impact plate thresholds. Perimeter of treads shall be banded with painted yellow caution stripe (on side, front and back) per ADAG requirements.
 3. Decks: Stainless steel.
 4. Handrails: Molded neoprene, steel mesh reinforced to minimize stretch, black color.

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5. Balustrades and Skirt Panels: Glass panels; narrow/slim profile secured to decks.
6. Operating Equipment: Motor and transmission drive, endless step drive chains, handrail drive, brake, safety devices, and drip pan to meet system criteria.
7. Electrical components: Controller, switches, conduit and conductors; UL approved.

2.04 Electrical System Characteristics:

1. Electrical Characteristics:
 - a. (##) hp rated load amperes.
 - b. 480 volts, three-phase, 60 Hz.
 - c. (##) amperes maximum circuit breaker size.
 - d. Starter Characteristics: Soft start type control.
 - e. Refer to Division Sixteen, - Equipment Wiring Systems: Electrical connections.
2. Motor: Refer to Division Fifteen, NEMA MG1.
3. Disconnect Switch: Factory mount disconnect switch on equipment under provisions established in the project specifications, Division Two requirements.

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 escalator devices remote from hoistway and between elevator machine rooms. Provide additional components and wiring to suit machine room layout.

2.06 Mechanical Equipment:

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1. Truss: The truss shall be of a welded, hot rolled, structural steel tube construction and shall have a factor of safety as prescribed by the American Standard Safety Code for Elevators, Escalators and Dumb Waiters, A17.1. The truss shall be designed to carry the passenger capacity load and machinery components, including balustrades, as well as the weight of exterior covering of plaster or other material of equal weight. The drive machine shall be located in the upper end and a reversing station shall be located in the lower end of the truss, each provided with a machinery space and covered with removable access covers, all within the outline of the standard truss.
2. Isolation Mounting: The escalator supports at both upper and lower ends shall be a complete assembly of rubber and steel designed to provide isolation from the building structure.
3. Drive Machine: A totally enclosed geared machine specially designed for this service shall be furnished. It shall include a drive motor, electro-magnetic brake. The machine shall be mounted on the truss and be connected by direct drive to the upper step drive sprocket. A separate output shaft shall be provided for the handrail drive. The drive machine shall be designed to substantially match speeds of the step band and handrails. Lubrication of the gears and bearings shall be by synthetic based oil bath.
4. The escalator(s) shall be equipped with a motor designed for escalator service. The motor shall be of squirrel cage design, ball bearing type, integrally and horizontally mounted to the drive machine utilizing a flexible coupling. The motor shall be flange mounted to the main drive gear case and torsionally connected to the gear box input shaft by a flexible coupling. Driving motor and motor switch gear shall be designed in such a way as to provide a smooth start, which shall prevent undue strain on drive components. The motor shall be of sufficient size to operate the escalator at full-rated capacity, ascending without exceeding the rated horsepower. The motor shall be continuous rated with a temperature rise not exceeding those in the NEMA and IEE Standards. Each escalator shall be provided with a Permanent Magnet Ceramic brake, located on the high speed shaft which, when activated, shall stop the escalator in the event of a normal stop control, activation of stop button, any safety device, or upon loss of power.
5. Permanent Magnet Ceramic Brake: A load compensating brake system shall be installed. The brake shall be capable of automatically stopping the escalator quickly but gradually, and

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shall hold the escalator stationary under full load whenever the power is interrupted. The brake shall be fail safe and electrically released. The system shall continually adjust brake torque to maintain a relatively constant deceleration independent of the load. The brake shall not cause the escalator to come to an abrupt stop. It shall be designed to meet ANSI Code deceleration requirements without adjustment. Design of the brake shall provide ease of access for inspection.

6. Controller: The controller shall be of the electro-magnetic type. The controller shall monitor the condition of each safety switch, brake, and motor operation, and shall cause the escalator to come to a safe stop upon activation of any safety switch, brake problem, or motor overload. Should a power failure occur, the controller shall automatically cut off the power supply to the motor, apply the brake and bring the escalator to a quick and smooth stop. The controller shall include phase and overload protection.
7. Newel Ends: Both the upper and lower newel ends shall be designed to allow the return of the handrail without undue stress. The upper newel end shall support the handrail around the newel through the use of an air bearing in lieu of rollers to minimize drag and maximize handrail life.
8. Step Guidance: A step guidance system shall be provided to control the movement of the steps both horizontally and vertically. A nominal 1/16-inch clearance shall be provided between the step and skirt panels. At the manufacturers option, a plastic step side plate may be provided in lieu of the step guidance system.
9. Upper Reversing Station: The Upper Reversing Station and drive shall include a precision-machined step chain sprocket mounted on the machine output shaft and rotating on bearings.
10. Lower Reversing Station: The Lower Reversing Station shall consist of a floating track system designed to maintain proper tension on the step chain by use of springs. It shall be designed to maintain uniform chain tension, and shall detect movement of the carriage through the activation of a safety switch.
11. Step Band: The step band shall consist of consecutively running steps powered and spaced with a chain designed for long life and quiet operation. The chain shall be a precision roller flat link type, manufactured from high quality material with heat treated bushings and chain link pins.

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12. Steps: The steps shall be formed from one-piece die cast aluminum with closely spaced tread and riser cleats. The step rollers shall rotate on sealed ball bearings. A minimum of two steps move horizontally at upper and lower landings. Vertical curved step risers shall be furnished with vertical cleats arranged to pass between the cleats of the tread on the adjacent step to form an inter-meshing unit with minimum clearances.
- a. The steps shall be designed to be easily removed from the step band on the incline without opening the unit.
 - b. Step demarcation lines shall be provided on the sides and rear of each step as a safety measure. The lines shall be fabricated from reinforced structural plastic, shall be easily replaced and shall be 1-1/4 inches (32 mm) wide at the sides and 1-3/4 inches (45 mm) wide at the rear. The color of the demarcation lines shall be [Select one of the following]:
 1. Gray
 2. Red
 3. Black
 4. Yellow

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13. Comb Plates: Adjustable comb plates shall be located at the top and bottom landings. The comb plates shall support injection molded, reinforced structural plastic comb segments, which shall be designed to be easily removable and to mesh deeply and evenly with the cleats on the step, treads. The skid resistant comb plates shall be designed to sense both horizontal and vertical movement of the comb segments.
14. Access Covers: Lightweight aluminum access covers shall be provided. The design of these non-skid access covers shall allow for ease of maintenance. These covers shall be provided at both upper and lower landings.
15. Control Station: At both the upper and lower landings, located near the handrail inlet, a station shall be provided which shall include a key actuated direction-starting switch. The controller shall prevent restarting with the key in the on position.
16. Handrails: Escalator handrails, properly constructed and reinforced, shall be provided. Handrails shall be endless with a smoothly vulcanized splice and shall operate with the moving steps. The handrails shall move on specially formed guides and traction sheaves. Close fitting safety guards shall be provided by handrail openings in the newel base. The handrail color shall be black.

2.07 Safety Devices:

1. The following safety devices shall be provided:
 - a. Broken Chain Safety Device: A broken chain safety device, a part of the lower reversing station assembly, shall be provided with a safety switch for each chain designed to cut off the electrical power and bring the escalator to rest should either chain break.
 - b. Step-Up Thrust Switch: A step-up thrust switch shall be located on each side of the lower curve track on the lower end of each escalator. This switch shall be designed to cut off the electrical power and bring the escalator to rest should a step be displaced against the up thrust track.
 - c. Comb Plate Safety Device: A safety device shall be provided at the upper and lower landing comb plate. The sensitive electrical switches of this device shall be designed to cut off the electrical power and bring the escalator quickly to rest

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should an obstruction occur between the comb segments and step treads.

- d. Step-Skirt Safety Device: Step-skirt safety devices shall be provided. Pressure sensitive electrical safety switches shall be located on each side of the balustrade within the skirt panels. The switches shall be designed to cut off the electrical power and bring the escalator to rest should an obstruction occur between the step and skirt panel. Switches shall be of the plunger, self-resetting type, adjustable to maintain the required position and clearance from the skirts.
- e. Missing Step Switch: This safety feature shall be provided to prevent the unit from running if a step is missing. This shall be accomplished by an electro-mechanical device designed to detect a missing step or step(s) at the upper or lower reversing station.
- f. Step Demarcation Lights: Step demarcation lights shall be furnished at the top and bottom of each escalator. They shall consist of a light fixture installed just below the track system where the step leaves or enters the comb plate. This fixture shall be furnished with two independent green fluorescent lamps and shall be capable of lighting the entire width of the step. The light, which shall be visible between the steps and the step and comb segment, shall provide a reference point for entering or exiting the escalator.
- g. Handrail Inlet Safety: A handrail inlet safety device shall be provided at the handrail inlet in the newel. The sensitive electrical switch of this device shall be designed to cut off the electrical power and bring the escalator to rest should an object enter the handrail inlet area.
- h. Stopped Handrail Device: A magnetic sensor shall be provided to sound the alarm, remove power and stop the escalator should a handrail break, stop moving, or slow beyond a preset speed.
- i. Emergency Stop Buttons: Emergency stop buttons shall be provided, designed so that the momentary pressure of either button shall cut off the electrical power supply to the motor and bring the escalator to rest. One emergency stop button shall be located at each landing, accessible on the exterior deck cover. Location shall be in the newel upper radius quadrant, 45 degrees above horizontal, in order to provide easy access. The stop button shall be red in color. -The

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button shall be housed under a clear, high impact resistant plastic cover, which shall be self-closing. Instructions for operating the stop button shall be imprinted on the cover in half-inch high letters. When the cover is lifted, an audible alarm shall sound until the cover is returned to its closed position.

- j. Safety Signs: A pictorial sign meeting the requirements of the ANSI Code shall be provided at both the upper and lower landings. A separate sign, at both locations, shall provide escalator-riding rules.
- k. Pit Stop Switch: Each escalator shall be provided with an additional safety device, in the pit that shall interrupt power within the escalator and automatically apply the brake to bring the escalator to a smooth stop.

2.08 Additional Equipment: [Select one from 1 or 2]:

- 1. Glass Balustrade: Glass Balustrades shall be provided between the escalator decks and the handrails. The Balustrades shall be constructed of 3/8-inch (9 mm) tempered glass and shall be installed without mullions between the panels. The color of the glass shall be [Select one of the following]:
 - a. Clear
 - b. Smoked
 - c. Bronze
- 2. Balustrade: Balustrade panels shall be provided between the escalator decks and the handrails. These panels shall provide a finished surface for both the escalator interior as well as the escalator exterior above the exterior decks. Balustrade panels shall be installed without overlapping joints or requiring trim pieces to cover where two panels meet. The Balustrade shall be fabricated from hardwood plywood core wrapped in sheet metal of the type specified below:
 - a. Interior Balustrade Finish: The interior of the Balustrade between the decks and handrails shall be finished in [Select one of the following]:
 - 1. stainless steel #4 finish
 - 2. stainless steel #8 finish
 - 3. bronze #4 finish
 - 4. bronze #8 finish

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- b. Exterior Balustrade Finish: The exterior of the Balustrade shall be finished in [Select one of the following]:
 1. stainless steel #4 finish
 2. stainless steel #8 finish
 3. bronze #4 finish
 4. bronze #8 finish

3. Decks: The escalator decks shall be constructed such that there shall be an inner deck and an outer deck. The inner decks shall be fabricated from heavy gauge metal and be installed without visible fastenings. The outer decks shall be of two-piece construction. The base construction shall be of extruded aluminum and it shall be covered with a light gauge finished material and also be installed without visible fastenings. Deck panels shall be installed without overlapping joints or requiring trim pieces to cover where two deck panels meet. Both the inner decks and outer decks shall be finished in [Select one of the following]:
 - a. stainless steel #4 finish
 - b. stainless steel #8 finish
 - c. bronze #4 finish
 - d. bronze #8 finish

4. Skirts: The skirts shall be constructed from a heavy gauge material reinforced with zinc coated steel ribs. Skirts shall be fastened to the truss with hidden fastenings. Skirt panels shall be installed without overlapping joints or requiring trim pieces to cover where two skirt panels meet. The material the skirts shall be fabricated from is [Select one of the following]:
 - a. stainless steel #4 finish
 - b. stainless steel #8 finish
 - c. bronze #4 finish
 - d. bronze #8 finish
 - e. Teflon coated

5. (Option) Intermediate Supports: Escalator(s) included in this specification shall be designed with an intermediate truss support point, located to coincide with structural support provided in other sections of the specification. Structural building steel, support columns and other support structure is specified in other sections of the specification.

6. (Option) Comb Lighting: Lighting fixtures shall be installed at both the upper and lower ends of the specified escalator(s) to

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provide additional illumination to the area of the escalator comb plates. These lights shall be mounted in the escalator skirts and be located over the intersection of the step treads and comb teeth.

7. (Option) Apex Guards: Where the escalator handrail center line (diagonal) intersects with a horizontal surface (e.g. ceiling, etc.), the angle of intersection shall be protected with escalator contractor supplied and installed Apex Guards. These devices shall be fabricated from Plexiglas and are designed to minimize potential pinching hazards.
8. (Option) Anti-Slide Knobs: Escalator units included in this specification, which are to be installed in parallel with a high outer deck, shall be equipped with anti-slide knobs. These devices shall be affixed to the escalator common deck. Material and finish of these devices shall be stainless steel.
9. (Option) Horizontal Deck Guards: The escalator contractor shall furnish standard, Plexiglas horizontal deck guards at the upper and lower ends of each escalator included in this specification.

2.09 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.
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.

2.10 Motor:

1. The motor shall be rated A. C., NEMA code letter "G" or as required for the torque and duty requirements.
2. The motor shall be totally enclosed non-ventilated with a class F insulation rating.

2.11 Brake:

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

2.12 Lubrication:

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

2.13 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.
6. Skirts: Stainless Steel, #4 brushed finish.
7. Decks: Stainless steel, #4 brushed finish.
8. Interior Panels: Glass, clear.

PART 3: EXECUTION

3.01 Site Inspection:

1. Examine work of other Sections that affects the Escalator 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 by Others is complete. Check measurement of space for equipment and means of access for installation and operation.
3. Verify that electrical power is available and of the correct characteristics.

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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. Align components within manufacturer's allowed tolerances to obtain operation without objectionable noise, squeaks, pulsations, jumping, vibration, or roughness.
4. Connect equipment to building utilities.
5. Field Welds: Chip and clean away oxidation and residue, wire brush and apply two coats of primer and paint.
6. Provide ready access to lubrication points.

3.03 Erection Tolerances:

1. Quality Control: Tolerances.

3.04 Field Quality Control:

1. Quality Control: Field inspection, testing, adjusting, and balancing.
2. Perform tests required by ASME A17.1 and A17.2.3.
3. Test escalator 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 executes specific tests.

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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 quite operation.

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:

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

END OF STANDARD 14280