NEW PASSENGER TERMINAL
DULUTH INTERNATIONAL AIRPORT
PEORIA, ILLINOIS

SECTION 14310 - ESCALATORS

1 GENERAL

1. RELATED DOCUMENTS

a. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

2. SUMMARY

a. Section includes high-traffic escalators.

b. Related Requirements:

(1) Division 3 Section "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
(2) Division 5 Section "Structural Steel" for attachment plates, angle brackets, and other preparation of structural steel to support escalator trusses.
(3) Division 8 Section "Access Doors and Frames" for wall and ceiling access panels and access doors in escalator enclosures.
(4) Division 10 Section "Signs" for "Caution" signs required by ASME A17.1/CSA B44.
(5) Division 13 Section "Fire-Alarm System" for smoke detectors that activate escalator alarm and, after at least 15 seconds, cause the interruption of power to the escalator motor and brake and for connection to escalator controllers.
(6) Division 16 Sections for electrical service to escalators, including disconnect switches.

3. DEFINITIONS

a. High-Traffic Escalators: Designed specifically for high-traffic-volume use that produces dense occupancy resulting in structural, machinery, and brake loads much higher than normal.

4. ACTION SUBMITTALS

a. Product Data: Include capacities, sizes, performances, safety features, finishes, and similar information.

b. Shop Drawings:

(1) Include plans, elevations, sections, and details indicating coordination with building structure and relationships with other construction.
(2) Indicate maximum loads imposed on building structure at points of support, and power requirements.
(3) Indicate access and ventilation for escalator machine space.

c. Samples for Initial Selection: For exposed materials involving color selection.

d. Samples for Verification: For exposed escalator finishes, 4-inch- (100-mm-) square Samples of sheet materials, and 4-inch (100-mm) lengths of running trim members.

e. Delegated-Design Submittal: For escalators.

5. INFORMATIONAL SUBMITTALS

a. Qualification Data: For Installer.

b. Manufacturer Certificates: Signed by manufacturer certifying that escalator layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for escalator system being provided.

c. Sample Warranty: For special warranty.

6. CLOSEOUT SUBMITTALS

a. Operation and Maintenance Data: For escalators to include in emergency, operation, and maintenance manuals.

(1) In addition to items specified in Division 1 Section "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

b. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted escalator use.

c. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard five-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

7. QUALITY ASSURANCE

a. Installer Qualifications: Escalator manufacturer.

8. DELIVERY, STORAGE, AND HANDLING

a. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

9. COORDINATION

a. Coordinate installation of sleeves, block outs, escalator equipment with integral anchors, and other items that are embedded in concrete or masonry for escalator equipment. Furnish templates, sleeves, escalator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

b. Coordinate locations and dimensions of other work relating to escalators including sumps and floor drains in pits; electrical service; and electrical outlets, lights, and switches in pits.

10. WARRANTY

a. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace escalator work that fails in materials or workmanship within specified warranty period.

(1) Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
(2) Warranty Period: Five year(s) from date of Substantial Completion.

2 PRODUCTS

1. MANUFACTURERS

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

b. Basis-of-Design Product: Subject to compliance with requirements, provide <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:

(1) Fujitec America, Inc.
(2) KONE Inc.
(3) Mitsubishi Electric Corporation.
(4) Otis Elevator Co.

(5) Schindler Elevator Corp.
(6) ThyssenKrupp Elevator.

c. Source Limitations: Obtain escalators from single manufacturer.

2. PERFORMANCE REQUIREMENTS

a. Regulatory Requirements: Comply with ASME A17.1/CSA B44.

b. Braking Performance: Provide brakes that stop escalator in up-running mode at a rate no greater than 3 ft./s^2 (0.91 m/s^2).

c. Delegated Design: Engage a qualified professional engineer, as defined in Division 1 Section "Quality Requirements," to design escalators.

d. Structural and Mechanical Performance for High-Traffic Escalators: For the purposes of structural design, driving machine and power transmission calculations, and brake calculations, design high-traffic escalators for loads not less than 1.5 times the design loads required by ASME A17.1/CSA B44.

e. Structural Performance of Balustrades, Deck Barricades, and Handrails: Provide components and assemblies capable of withstanding the effects of loads indicated in ASCE/SEI 7 for handrail assemblies and guardrail systems.

3. ESCALATORS

a. High-Traffic Escalators, General: Manufacturer's high-traffic escalators complying with requirements. Unless otherwise indicated, manufacturer's heavy-duty components shall be used, as included in standard high-traffic escalator systems and as required for complete system.

b. Design and equip escalators to run in either direction.

c. Provide escalators with three flat steps at top and bottom landings.

d. Rated Speed: **90 fpm (0.46 m/s)**.

4. COMPONENTS

a. Fabricate exposed metalwork, including deck covers, balustrade panels, and trim to provide surface flatness equivalent to stretcher-leveled standard of flatness and sufficient strength for indicated use; increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as necessary. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.

b. Transparent Balustrades: Manufacturer's standard profile or arrangement of moving handrails on guide rail that is supported by tempered glass panels, with deck covers, skirts, trim, and accessories.

c. Direction Indicator Lights: Provide red and green indicator lights at least 2 inches (50 mm) in diameter in **right-hand** balustrade newels at both upper and lower landings. Green light indicates entrance end, and red light indicates exit end. When escalator is stopped, red lights are illuminated at both ends.

d. Guards at Ceiling Intersection: Clear plastic.

e. Handrails: Smooth, jointless, reinforced neoprene.

(1) Color: Black.

f. Deck Covers and Trim: Satin stainless steel.

g. Skirt Deflector Devices: Manufacturer's standard brush-type device.

h. Steps: One-piece, die-cast aluminum with demarcation grooves at front and rear of tread surface.

(1) Finish: Powder-coated, gray.
(2) Step Demarcation: 1-1/2- to 2-inch- (38- to 50-mm-) wide yellow stripe at sides and backs of step treads.
(3) Nosing Demarcation: 2-inch- (50-mm-) wide yellow stripe at nosings of step treads.

i. Combs: Integrally colored structural plastic.

(1) Comb Color: Yellow.

j. Combplate Lights: Provide recessed light fixtures with flush lenses mounted in skirt panels at each side of combplates, designed to illuminate combplate steps.

k. Floor Plates: with grooved or patterned surface and with abrasive material embedded in or metallically bonded to floor-plate surface.

5. FEATURES

a. Operational Control: Provide key-operated starter switches located on exterior deck above newel base at both upper and lower landings of escalators.

b. Fault Indicator: Provide escalators with a microprocessor unit that monitors safety devices, motor temperature, and escalator speed and records in nonvolatile memory the date, time, and device identification if a safety device is activated or escalator malfunctions.

(1) Provide built-in or plug-in unit to display recorded information.

c. Reduced-Current Starting: Provide escalator motors with wye-delta or solid-state starting.

d. Energy-Saving Feature: Provide escalator motors and controls designed for motors running on partial windings (at reduced power) when not under full load.

e. Provide motors complying with NEMA MG 1, Insulation Class B.

f. Brake-Saving Feature: Provide stopping mechanism that allows escalator to coast to a stop before applying brakes, unless stopping is initiated by a safety device.

g. Equip step drive mechanism with automatic step-chain lubricators.

h. Oil Drip Pan: Provide metal pan under full width and length of escalator to collect and hold oil and grease drippings from lubricated components. Design and fabricate drip pan to sustain a load of 250 lbf (1.1 kN) on a 1.0-sq. ft. (0.9-sq. m) area at any location without permanent deflection.

i. Overspeed Governor: Provide units with overspeed governor that is activated if speed of steps exceeds rated speed by more than 20 percent.

j. Upper-Landing, Step Upthrust Device: Activated if a step is displaced against upthrust track at upper curve in passenger-carrying line of track system.

k. Comb-Step Impact Device: Activated if a horizontal force in direction of travel is applied exceeding 112 lbf (500 N) at either side or exceeding 225 lbf (1000 N) at center of front edge of combplate, or a resultant force in upward direction is applied exceeding 150 lbf (688 N) at center of front edge of combplate.

6. MATERIALS

a. Stainless Steel: ASTM A 240/A 240M, Type 304.

(1) Satin Finish: No. 4 directional satin.

b. Steel Sheet: Cold-rolled steel sheet, ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

c. Clear Tempered Glass: ASTM C 1048, Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing, select), Kind FT (fully tempered), **12.0** mm thick.

3 EXECUTION

1. EXAMINATION

a. Examine escalator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

b. Examine supporting structure, machine spaces, and pits; verify critical dimensions; and examine conditions under which escalators are to be installed.

c. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

d. Proceed with installation only after unsatisfactory conditions have been corrected.

2. INSTALLATION

a. Comply with manufacturer's written instructions.

b. Set escalators true to line and level, properly supported, and anchored to building structure. Use established benchmarks, lines, and levels to ensure dimensional coordination of the Work.

c. Adjust installed components for smooth, efficient operation, complying with required tolerances and free of hazardous conditions. Lubricate operating parts, including bearings, tracks, chains, guides, and hardware. Test operating devices, equipment, signals, controls, and safety devices. Install oil drip pans and verify that no oil drips outside of pans**.**

d. Repair damaged finishes so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3. FIELD QUALITY CONTROL

a. Acceptance Testing: On completion of escalator installation and before permitting escalator use, perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by authorities having jurisdiction.

(1) For escalators specified to comply with requirements more stringent than those of ASME A17.1/CSA B44, perform tests for compliance with specified requirements. Test safety devices that are not required by ASME A17.1/CSA B44 as well as those that are.

b. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed.

4. DEMONSTRATION

a. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate**,** adjust, and maintain escalators.

b. Check operation of escalators with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

5. MAINTENANCE

a. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include <**Insert number**> months' full maintenance by skilled employees of escalator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper escalator operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

(1) Perform maintenance during normal working hours.
(2) Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of six hours or less.

END OF SECTION 14310