

SECTION 142100 – MRL ELECTRIC TRACTION ELEVATOR

PART 1 PRODUCTS

1.1 SECTION INCLUDES

- A. Machine-room-less gearless traction passenger elevators. Basis of Design (Schindler 3300)

1.2 RELATED SECTIONS

- A. Section 01 - Temporary Facilities and Controls: Protection of floor openings and personnel barriers; temporary power and lighting.
- B. Section 31 - Earth Moving.
- C. Section 03 - Cast-in-Place Concrete.
- D. Section 04- Unit Masonry Setting sleeves, inserts, and anchoring devices in masonry for guide-rail brackets.
- E. Section 05 - Metal Fabrications: Pit ladders, supports for entrances in drywall hoistways.
- F. Section 06 - Rough Carpentry: Temporary platform assembly.
- G. Section 09 - Painting and Coating: Field painting of elevator entrances over primer.
- H. Section 22 - Sump Pumps: For sump pumps, sumps, and sump covers in elevator pits.
- I. Section 23 - Heating, Ventilating, and Air Conditioning Equipment: Heating, cooling, and ventilation of control and machinery space.
- J. Section 26 - Common Work Results for Electrical: Light outlets, convenience outlets, light switches, and conduits.
- K. Section 26 - Low-Voltage Electrical Power Conductors and Cables: For telephone service for elevators and for Internet connection to elevator controllers for remote monitoring.
- L. Section 26 - Lighting: Light fixtures.
- M. Section 26 - Switchboards, Panelboards, and Control Centers: Disconnect switches.
- N. Section 27 - Voice Communications Terminal Equipment: Telephone outlets and elevator telephones.

1.3 REFERENCES

- A. ANSI/ASME A17.1/CAN/CSA B44 - Safety Code for Elevators and Escalators.
- B. BADAAG - Americans with Disabilities Act Accessibility Guidelines.
- C. CANSI/NFPA 70 - National Electrical Code.
- D. ANSI/NFPA 80 - Fire Doors and Windows.
- E. ANSI/UL 10B - Fire Tests of Door Assemblies.

- F. CAN/CSA C22.1 - Canadian Electrical Code.
- G. Model and Local Building Codes.
- H. ISO 9001: 2000 - Quality Management Systems - Requirements.
- I. Model and Local Building Codes.

1.4 DESIGN REQUIREMENTS

- A. Arrange elevator components in a machinery space so equipment can be removed for repairs or replaced with minimal disturbance to other equipment and components.
- B. Where permitted by code, provide all elevator equipment including controls, drives, transformers, and rescue features within the elevator hoistway. On applications where the line voltage for the elevator is 240V, provide an autotransformer outside of the hoistway located in a closet or electrical room.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Submit manufacturer/installer's product data, including:
 - 1. Descriptive brochures or detail drawings of cab and hall fixtures, cab decoration options, and product features.
 - 2. Power Information: Horsepower, starting current, running current, machine and control heat release, and electrical requirements.
- C. Shop Drawings: Submit manufacturer/installer's shop drawings, including plans, elevations, sections, and details, indicating location of equipment, loads, dimensions, tolerances, materials, components, fabrication, fasteners, hardware, finish, options, accessories, and other information to render totally functional elevators.
- D. Samples: Submit manufacturer/installer's samples of standard colors and finishes of finish materials.
- E. Operation and Maintenance Manual: Submit manufacturer/installer's operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; renewal parts catalogs; and electrical wiring diagrams.
- F. Warranty: Submit documentation associated with manufacturer/installer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10 years experience in manufacturing and installing elevator equipment of the types specified.
- B. Regulatory Requirements:
 - 1. Elevator design, clearances, construction, workmanship, materials, and installation, unless specified otherwise, shall be in accordance with ANSI/ASME A17.1, handicap accessibility, Americans with Disabilities Act, and other codes having legal jurisdiction.
 - 2. ANSI/ASME A17.1 shall govern, except where codes having legal jurisdiction include more rigid requirements or conflict with ANSI/ASME A17.1.
 - 3. Elevator shall follow design and manufacturing procedures certified in accordance with ISO 9001:2000 to meet product and service requirements for quality assurance for new products.
 - 4. Where product is in variance to the published ANSI/ASME A17.1 model code, provide a third party AECO certification demonstrating equivalent function, safety, and performance.
- C. Pre-installation Meeting:

1. Convene pre-installation meeting before start of installation of elevators.
2. Require attendance of parties directly affecting work of this section, including Contractor, Architect, and elevator manufacturer/installer.
3. Review examination, installation, field quality control, adjusting, cleaning, protection, and coordination with other work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Do not store products in location with conditions outside manufacturer's absolute limits.
- C. Materials delivered to the site shall be examined for concealed damage or defects in shipping. Defects shall be noted and reported to the Architect in writing.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Temporary Electrical Power:
 1. Coordinate availability of temporary, single-phase, 60 Hz, GFCI-protected electricity to be available for installation of elevator components.
 - a. Voltage: 220 VAC.
- C. Installation of the Elevator:
 1. Coordinate availability of permanent three-phase power prior to installation start.
 2. Coordinate availability of clear, rollable access to a 10 foot by 20 foot secure and dry storage area prior to delivery.
 3. Coordinate availability of a clean, dry, and complete hoistway along with temporary installation platform and all required OSHA-compliant barricades prior to delivery.
- D. Temporary Use of Elevator:
 1. Coordinate with manufacturer/installer for temporary use of elevator, if required.
 2. Temporary use of elevator shall be in accordance with terms and conditions of manufacturer/installer's temporary acceptance form.

1.9 SCHEDULING

- A. Coordinate elevator work with work of other trades, for proper time and sequence to avoid construction delays.

1.10 WARRANTY

- A. Manufacturer/Installer Standard Warranty: Manufacturer/installer shall guarantee materials and workmanship of equipment installed under these specifications and make good, defects not due to ordinary wear or to improper use, which may develop within 1 year after completion of installation or acceptance thereof by beneficial use, whichever is earlier.

1.11 MAINTENANCE SERVICE

- A. Elevator maintenance service shall be performed by elevator manufacturer/installer.
- B. Elevators shall receive regular maintenance on each unit for period below after completion of work specified herein or acceptance thereof by beneficial use, whichever is earlier.

1. Maintenance Period (Months): 12.
 2. Maintenance Period (Months): 3.
- C. Trained employees shall make periodic examinations and perform work including necessary adjusting, greasing, oiling, and replacing parts to keep elevators in operation, except parts that require replacement because of accidents, vandalism, misuse, or negligence by parties other than manufacturer/installer.
- D. Manufacturer/installer shall perform all Work, except emergency minor adjustment call-back service as follows:
1. During regular working hours.
 2. On overtime.
- E. Manufacturer/installer shall provide emergency minor adjustment call-back service as follows:
1. During regular working hours.
 2. 24 hours, 7 days a week.
- F. Should Owner request that examinations, cleaning, lubrication, adjustments, repairs, replacements, or emergency minor adjustment call-back service, unless specified herein, be performed on other than manufacturer/installer's regular working hours of regular working days, manufacturer/installer shall absorb straight-time labor charges and Owner will compensate manufacturer/installer for overtime premium, travel time, and expense at normal billing rates.
- G. Elevator Control System:
1. Include built-in remote diagnostic module to relay constant status of elevators and control system to a 24-hour, 7-days-a-week, central-monitoring facility.
 2. Remote Monitoring Device: Transmit information on current status of elevators, including malfunctions, system errors, and shutdown.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Schindler Elevator Corporation, which is located at: 20 Whippany Rd.; Morristown, NJ 07960; Tel: 973-397-6500 ; Fax: 973-397-3710;
- B. Substitutions: or approved equal.

2.2 ELEVATOR SYSTEM AND COMPONENTS

- A. Electric Traction Passenger Elevators: Schindler 3300 Gearless Traction Elevator as manufactured by Schindler Elevator Corporation.
- B. Elevator Equipment Summary:
1. Application: Machine Room Less.
 2. Counterweight Location: Side.
 3. Machine Location: Top of the hoistway mounted on car and counterweight guide rails.
 4. Control Space Location: As indicated on Drawings.
 5. Control Space Location: Top landing entrance frame.
 6. Control Space Location: Entrance frame at one floor below the top landing.
 7. Service: General Purpose Passenger.
 8. Quantity of Units: As indicated on Drawings.
 9. Capacity, Clear Inside Dimensions: 3500 lbs (1587 kg), 6 feet 9 inches (2057 mm) W x 5 feet 7 inches (1702 mm) D.
 10. Speed: 150 fpm (45.7 mpm).
 11. Travel: Within manufacturer's normal range, maximum 98 feet 5 inches (30 m), minimum 8 feet 7 inches (2.67m).

12. Landings: As indicated on Drawings.
 13. Front Openings: As indicated on Drawings.
 14. Operation: As indicated on Drawings.
 15. Cab Height: 7 feet 9 inches (2362 mm).
 16. Guide Rails: 15 lb per foot (2.32 kg/m).
 17. Entrance Type and Width: As indicated on Drawings.
 18. Entrance Height: 7 feet (mm).
 19. Power Supply: As indicated on Drawings.
- C. Performance
1. Car Speed: Minus 10 percent to plus 5 percent of contract speed under any loading condition or direction of travel.
 2. Car Capacity: Safely lower, stop and hold up to 125 percent of rated load per code.
- D. Ride Quality:
1. Vertical Vibration (maximum): 25 mg.
 2. Horizontal Vibration (maximum): 17 mg.
 3. Vertical Jerk (maximum): 2 ft/sec³.
 4. Acceleration (maximum): 1.6 ft/sec².
 5. In Car Noise: 53-60 dB(A).
 6. Stopping Accuracy: Plus or minus 5 mm.
 7. Starts per hour (maximum): 180.
- E. Elevator Operation:
1. Simplex Collective Operation: Using a microprocessor based controller, operation shall be automatic by means of the car and hall buttons. When all calls have been answered, the car shall park at the last landing served.
 2. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching algorithm designed to minimize passenger waiting time.
- F. Operating Features:
1. Door light curtain protection.
 2. Static AC drive.
 3. Phase monitor relay.
 4. Cab overload with indicator.
 5. Load-weighing.
 6. Central alarm.
 7. Remote monitoring.
 8. Firefighter's operation.
 9. Automatic evacuation; when the main line power is lost for longer than 5 seconds the emergency battery power supply provides power automatically to the elevator controller. If the car is at a floor when the power fails, it remains at that floor, opens its doors, and shuts down. If the car is between floors, it is raised or lowered to the first available landing, opens its doors, and shuts down.
 10. Independent service.
 11. Earthquake operation compliant with ANSI A17.1.
 12. Hoistway access operation.
 13. Shunt trip protection.

2.3 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

- A. Controller: Provide microprocessor based control system to perform all of the functions of safe elevator operation, as well as perform car and group operational control.
1. All high voltage (110v or above) contact points inside the inspection and test panel shall be protected from accidental contact in a situation where the access panels are open.

2. The controller shall be distributed throughout the elevator system located in the overhead, cab and inspection and test panel. The inverter will be mounted in the overhead adjacent to the hoist machine and an inspection and test panel will be located in the door jamb at the top floor or one floor below the top floor. No elevator equipment mechanical rooms or closets are required.
 3. Provide multi-bus control architecture to reduce cabling, material and waste.
- B. Drive: Provide a Variable Voltage Variable Frequency AC Closed Loop drive system. Provide stable start without high peak current, quickly reaching a low energy consumption level.
- C. Inspection and Test Panel: Integrated control equipment, main inspection and test panel in door frame at top level served or at one floor below the top level served.

2.4 EQUIPMENT: HOISTWAY COMPONENTS

- A. Machine:
1. Gearless asynchronous AC motor with integral drive sheave, service and emergency brakes.
 2. Design machine to enable direct power transfer, thereby avoiding loss of power.
 3. Design machine to be compact, lightweight and durable to optimize material usage and save space.
 4. Mount to structural support channels on top of guide rail system as applicable in hoistway overhead.
- B. Governor:
1. Tension type over-speed governor with remote manual reset.
 2. Mount to structural support channels as applicable in hoistway overhead.
- C. Buffers, Car and Counterweight: Compression spring type buffers to meet code.
- D. Hoistway Operating Devices:
1. Emergency Stop switch in the pit.
 2. Terminal stopping switches.
 3. Emergency stop switch on the machine.
- E. Positioning System: System consisting of proximity sensors and door zone vanes.
- F. Guide Rails and Attachments: Provide Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.
- G. Suspension System: Non circular elastomeric coated suspension media with high tensile grade steel cords.
- H. Governor Rope: Steel wire rope with 6 mm diameter.

2.5 EQUIPMENT: HOISTWAY ENTRANCES

- A. Hoistway Doors and Frames:
1. UL rated with required fire rating.
 2. Doors: Rigid flush panel construction with vertical channel reinforcements.
 3. Frames: Securely fasten at corners to form unit frame. Frames shall be bolted.
- B. Finish:
1. Exposed Areas of Corridor Frames: Manufacturer's standard baked enamel on steel.
 2. Exposed Areas of Corridor Frames: Manufacturer's standard brushed stainless steel.
 3. Doors: Manufacturer's standard baked enamel on steel.
 4. Doors: Manufacturer's standard brushed stainless steel.
- C. Sills: Extruded aluminum.

- D. Entrance Markings and Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Comply with manufacturer drawings for plate mounting.

2.6 EQUIPMENT: CAR COMPONENTS

- A. Car Frame and Safety: Provide car frame with adequate bracing to support the platform and car enclosure. The safety shall be integral to the car frame and shall be flexible guide clamp type.
- B. Platform: Provide platform of steel construction with plywood subfloor and aluminum threshold.
- C. Car Guides: Provide sliding guide shoes mounted to top and bottom of both car and counterweight frame. Arrange each guide shoe assembly to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.
- D. Provide central guiding system to reduce mechanical friction and energy consumption.
- E. Steel Cab:
 - 1. Compliance:
 - a. Fire Rating: Provide Class B fire rating for cab.
 - b. Design cab to comply with LEED Indoor Environmental Quality requirements through use of Low-Emitting Materials on walls, ceiling and subflooring.
 - 2. Car Finishes:
 - a. Car Walls: Brushed stainless steel.
 - b. Car Walls: Baked enamel.
 - c. Car Walls: Plastic laminate.
 - d. Base and Frieze: Aluminum.
 - e. Car Front: Brushed stainless steel.
 - f. Car Door: Brushed stainless steel.
 - 3. Ceiling: Suspended ceiling, finished in brushed stainless steel or painted silver metallic. Provide lighting consisting of four compact fluorescent energy saving lights located in two semi-oval lateral cutouts located on the center-sides of the cab ceiling, Lexan lens cover.
 - a. Car Ceiling: Brushed stainless steel.
 - b. Car Ceiling: Painted silver metallic.
 - 4. Handrail: 1-3/8 inch (36 mm) diameter round cast aluminum.
 - a. Handrail Location: Rear wall.
 - b. Handrail Location: Side walls.
 - c. Handrail Location: Both rear and side walls.
 - d. Handrail Finish: Painted aluminum.
 - e. Handrail Finish: Brushed aluminum.
 - f. Handrail Finish: Mirror finish aluminum.
 - 5. Flooring: Furnished and installed under Division 9, not to exceed 3/8 inch (9.5 mm) finished depth.
 - 6. Ventilation: Provide one-speed fan in suspended ceiling.
 - 7. Emergency Cab Lighting: Provide an emergency power unit employing a 12 volt sealed rechargeable battery and static circuits to illuminate the elevator cab and provide current to the alarm bell in the event of building power failure.
 - 8. Emergency Siren: Provide siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged.
 - 9. Emergency Exit Switch: Provide an electrical contact to open the safety circuit when the emergency car top exit is opened. When the exit door is opened, the top exit switch shall signal the control and the elevator will be unable to move.
 - 10. Emergency Exit Lock: Provide an emergency exit lock where required by local code.
 - 11. Emergency Exit Guard: Provide emergency exit guard on top of car when required for hoistway wall to platform clearance exceeds 12 inches (305 mm) or for multiple elevators in hoistway.

2.7 DOOR OPERATOR AND REOPENING DEVICES

- A. Door Operator: Provide a closed loop VVVF high performance door operator with frequency controlled drive for fast and reliable operation to open and close the cab and hoistway doors simultaneously.
- B. In case of interruption or failure of electric power, the doors can be readily opened by hand from within the cab, in accordance with applicable code. Provide emergency devices and keys for opening doors from the landing as required by local code.
- C. Doors shall open automatically when the elevator has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. Provide door open button in the cab operating panel. Momentary pressing of this button shall reopen the doors and reset the time interval.
- D. Provide door hangers and tracks for each cab and hoistway door. Contour tracks to match the hanger sheaves. Design hangers for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed for life bearings.
- E. Electronic Door Safety Device: Equip cab doors with concealed transmitter and receiver infrared beam devices to detect presence of object in process of passing through hoistway entrance and cab doorway (light curtain device).
 - 1. Use multi-beam scanning without moving parts to detect obstructions in door opening.
 - 2. Detector Device: Prevent doors from closing, or if they have already started closing, cause doors to reopen and remain open while object is within detection zone.
 - 3. Horizontal Beams: Minimum of 33 infra red beams to fill doorway from ground level to a height of 6 feet (1829 mm).

2.8 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: Provide a car operating panel with all push buttons, key switches and message indicators for elevator operation.
 - 1. Full height car operating panel shall be surface-mounted on front return.
 - 2. Comply with handicap requirements.
 - 3. Push Buttons: Mechanical, illuminating using long-lasting LEDs for each floor served.
 - 4. Emergency Buttons: Provide in accordance with code. Emergency alarm button, door open and door close buttons
- B. Features of Car Operating Panel:
 - 1. Digital Car Position: Indicator with destination indicator.
 - 2. Audible chime to signal that the car is either stopping at or passing a floor served by the elevator.
 - 3. Raised markings and Braille provided to the left hand side of each push button.
 - 4. Car Lantern: Provide LED illuminated car lantern with direction arrows to comply with local code when hall lanterns are not provided.
 - 5. Door open and close push buttons.
 - 6. Firefighter's hat and Phase 2 Key-switch.
 - 7. Inspection key-switch.
 - 8. Key-switch for optional Independent Service Operation.
 - 9. Illuminated alarm button with raised marking.
 - 10. Elevator Data Plate marked with elevator capacity and car number.
 - 11. Help Button: Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
- C. Hall Fixtures: Provide hall fixtures with necessary push buttons and key switches for elevator

operation.

1. Push Buttons: Metallic tactile push buttons, up button and down button at intermediate floors, single button at each terminal floor.
 2. Height: Comply with handicap requirements.
 3. Illumination: Illuminating using long-lasting low power LEDs.
- D. Directional Arrows: LED illuminated direction arrows with audible and visible call acknowledgement.
- E. Hoistway Access Switches: Provide key-switch at top and/or bottom floor in entrance jamb as required by local code.
- F. Firefighter's Phase 1 Service: Key switch in brushed stainless steel cover plate.
- G. Fixture Cover Plates: For push buttons, hall lanterns and position indicators, tempered white back-printed glass, no screws required for mounting. Provide stainless steel cover plates for Firefighters Phase I switch and hoistway access switches, with tamper resistant screws in same finish.
- H. Mounting: Mount hall fixtures in entrance frames.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine hoistways, hoistway openings, pits, and overheads before starting elevator installation.
- B. Verify hoistway, pit, overhead, and openings are of correct size, within tolerances, and are ready for work of this Section.
- C. Verify walls are plumb where openings occur and ready for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.
- D. Verify hoistway is clear and plumb, with variations not to exceed minus 0 to plus 1 inch (25 mm) at any point. Verify projections greater than 4 inch (102 mm) must be beveled not less than 75 degrees from horizontal. No negative tolerance is permitted for minimum hoistway dimensions.
- E. Verify minimum 2-hour fire-resistance rating of hatch walls.
- F. Notify Architect in writing of dimensional discrepancies or other conditions detrimental to proper installation or performance of elevators.
- G. If preparation is the responsibility of another installer, notify Architect of deviations from manufacturer's recommended installation tolerances and conditions.
- H. Do not proceed with installation until substrates have been properly prepared and deviations are corrected.
- I. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

- A. Elevator shall be installed by elevator manufacturer.
- B. Install elevators in accordance with manufacturer/installer's instructions and ANSI/ASME A17.1.
- C. Set entrances in vertical alignment with car openings, and aligned with plumb hoistway lines.

3.3 FIELD QUALITY CONTROL

- A. Perform tests of elevator as required by ANSI/ASME A17.1 and governing codes.

3.4 ADJUSTING

- A. Adjust elevators for proper operation in accordance with manufacturer/installer's instructions.
- B. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- C. Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.
- D. Adjust automatic floor leveling feature at each floor to within 1/4 inch (6 mm) of landing.
- E. Repair minor damages to finish in accordance with manufacturer/installer's instructions and as approved by Architect.
- F. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.5 CLEANING AND PROTECTION

- A. Clean in accordance with manufacturer's recommendations. Clean elevators promptly after installation in accordance with manufacturer/installer's instructions. Do not use cleaning materials or methods that could damage finish.
- B. Protect installed elevators from damage during construction in accordance with the negotiated temporary use agreement between Owner and manufacturer's installer. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products and finishes in accordance with manufacturer's instructions before Substantial Completion.

END OF SECTION