



Design and Construction Standards

Design Criteria

Division 14

Conveying Equipment

All new construction activities at Seattle-Tacoma (SeaTac) International Airport are required to meet the Design and Construction Standards (DCS) from the planning and design stages through actual construction and facilities maintenance. Any exceptions shall be submitted for approval to the Port of Seattle.

Rev Date	Pages	Remarks	Documents Referenced
01/07/2025	All	New Design Guideline published.	
02/10/2025	All	Modify for Port of Seattle comments.	
04/08/2025	All	Modify for Port of Seattle comments.	
06/03/2025	All	1. Hydraulic Elevators need F&I Approval. 2. POSFD CAS 2024 Code Reference.	
06/25/2025	All	Updated Header and Footer	
07/30/2025	All	Modify for Port of Seattle comments.	
10/21/2025	All	Update Revision Date to Align with Specifications	

1.1 PURPOSE

A. SCOPE OF STANDARD

1. This standard provides general guidance concerning the specific preferences of Seattle-Tacoma International Airport (SeaTac) for elevator, escalator, moving walk, dumbwaiter, and wheelchair lift basic requirements.
2. This document is intended to provide useful information to the Design Team to establish a basis of design. The responsibility of the engineer/architect is to apply the principles of this section and the ones that follow so that the airport may achieve a level of quality and consistency in the design of their facilities. Deviations from these criteria must be approved by the Design Team.

1.2 GENERAL

A. PERFORMANCE REQUIREMENTS

1. General: Refer to Section 14 20 00, Vertical Transportation, General.

B. QUALITY ASSURANCE

1. Regulatory agencies: elevator design, materials, construction clearances, workmanship, and tests shall conform to the requirements of the codes and regulations listed in Section 14 20 00, Vertical Transportation, General.
2. Welding: Welding shall be performed in accordance with the requirements of AWS or CWB. Welders shall produce evidence of current certification by AWS or CWB.
3. Requirements of Regulatory Agencies
 - a. Installer shall obtain and pay for all necessary permits and perform such tests as may be required for acceptance and approval of elevators by jurisdictional agencies.
 - b. Installer shall notify the proper inspectors to witness required testing.
4. Factory Visit:
 - a. The Installer shall provide for the costs of up to three Port of Seattle representatives to visit the factory where the vertical transportation equipment is being manufactured, per contract, per unit type.
 - b. Installer shall not ship the VT equipment without the approval of Port of Seattle's representative after the conclusion of the factory visit.

C. REFERENCES

1. Definitions: Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.
2. American Society of Mechanical Engineers:
 - a. ASME A17.1 - Safety Code for Elevators and Escalators.
 - b. ASME A17.2 – Guide for Inspection of Elevators, Escalators, and Moving Walks.
 - c. ASME A17.5 – Elevator and Escalator Electrical Equipment.
 - d. ASME A17.6 – Standard for Elevator Suspension, Compensation, and Governor Systems.
3. International Building Code (IBC).
4. National Fire Protection Association (NFPA):
 - a. NFPA 70 – National Electric Code.
 - b. NFPA 80 – Fire Doors and Windows.
 - c. NFPA 101 – Life Safety Code.
5. 2024 Port of Seattle Fire Department’s Code Amendments, Standards, and Interpretations
6. Washington Administrative Code, WAC.
7. American National Standard Institute (ANSI): A117.1 - Accessible and Usable Buildings and Facilities.
8. 2010 ADA Standards for Accessible Design, Section 407.

D. FIELD CONDITIONS

1. Seismic:
 - a. Elevator system withstands the effects of earthquake motions determined according to SEI/ASCE 7 and complies with elevator safety requirements for seismic risk Zone 2 or greater in ASME A17.1/CSA B44.
 - b. The term “withstand” means the system will remain in place without separation of any parts when subjected to the seismic forces specified.
 - c. Provide earthquake equipment required by ASME A17.1/CSA B44.
 - d. Provide Alpha-Numeric display if Earthquake Mode is needed.
 - e. Provide seismic switch required by SEI/ASCE 7.
 - f. Design earthquake spectral response acceleration short period (Sds): As Shown on Structural Drawings.
 - g. Occupancy Category: As Shown on Structural Drawings.
 - h. Project Seismic Design Category: As Shown on Structural Drawings.
 - i. Elevator Component Importance Factor (Ip): As Shown on Structural Drawings.

E. SUBMITTALS

1. Refer to Section 14 20 00, Vertical Transportation, General.

2. Product Data:
 - a. Submit manufacturer's product data for each product and material.
 - b. Indicate manufacturer, trade names, and model numbers, components, arrangement, optional and accessories being provided.
 - c. Include applicable literature, catalog material or technical brochures.
 - d. Include material and equipment specifications, sizes, types, dimensions, weights, rated capacities, and performance curves.
 - e. Include utility requirements for wiring, piping, and service connection data, motor sizes complete with electrical characteristics.
3. Shop Drawings:
 - a. Include plans, elevations, sections, and large-scale details indicating openings at each landing, machine room/equipment space layout, coordination with building structure, relationships with other construction, and locations of equipment.
 - b. Include cab and entrance drawings, including dimensions, finishes and details.
 - c. Include large-scale layout of car operating panels and hall fixtures.
 - d. Indicate maximum dynamic and static loads imposed on building structure at points of support and maximum and average power demands.
 - e. Power Confirmation Information: Include motor horsepower, code letter, starting current, full-load running current, and demand factor.
 - f. All shop drawings submitted must be signed and sealed by an Engineer licensed in the state of Washington.
4. Samples for Initial Selection: For finishes involving surface treatment, paint or color selection.
5. Maintenance Control Programs: within sixty (60) days after notice to proceed, and prior to installation, Installer shall submit detailed equipment specific interim and revenue service Maintenance Control Programs, showing functions to be performed and their scheduled frequency.
6. Operating and Maintenance Manuals:
 - a. Description and sequence of operation of all equipment installed, including operating use for Building Personnel and tenants, as well as system troubleshooting manuals for technicians.
 - b. Maintenance instructions and procedures of all vertical transportation equipment installed, including parts lists, for each elevator system.
 - c. Lubrication charts indicating all lubricating points and type of lubricant recommended for all equipment.
 - d. Complete parts catalogs for all replaceable parts.
7. Tools:
 - a. The following equipment is furnished upon completion and before final payment:
 - a) The Elevator Contractor provides all the necessary tools, including laptop, hand-held devices, required software and manuals, required to troubleshoot, adjust, synchronize, calibrate, repair, and maintain the vertical transportation systems, as well as perform all necessary procedures to perform all safety tests as required by code and local governing authority.
 - b) Owner's equipment and software is updated regularly to properly troubleshoot, adjust, synchronize, calibrate, repair, maintain and test the vertical transportation

systems. All equipment and/or software is of the same version as issued to technicians maintaining the vertical transportation systems.

- c) The Elevator Contractor provides a backup copy of any software that resides on the troubleshooting tool.
- d) Upon cancellation of service agreement, the Elevator Contractor provides all updates indicated above.

F. JOB CONDITIONS

- 1. General: Refer to Section 14 20 00, Vertical Transportation, General.

G. DELIVERY, STORAGE, AND HANDLING

- 1. General:
 - a. The protection of all equipment and exposed finishes is the responsibility of the Elevator Contractor during delivery, handling, and installation until final acceptance of elevator equipment.
 - b. The Elevator Contractor replaces damaged materials with new, at no additional cost for material and labor.
- 2. Delivery and Storage: It is the responsibility of the Elevator Contractor to properly store and protect all materials in space provided or designated by the Contractor against damage, stains, scratches, corrosion, weather, construction debris and environmental conditions.
- 3. Hoisting: All required hoisting and movement of equipment is the responsibility of the Elevator Contractor.

H. COORDINATION

- 1. General: Refer to Section 14 20 00, Vertical Transportation, General.
- 2. Coordinate installation of VT equipment with integral anchors, and other items that are embedded in concrete or masonry for VT equipment. Furnish templates, sleeves, escalator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- 3. Coordinate sequence of VT installation with other work to avoid delaying the Work.

I. WARRANTY

- 1. Manufacturer's Warranty: Manufacturer agrees to repair, restore, or replace elevator equipment that fails due to defective materials or poor workmanship within specified warranty period.
- 2. Warranty Period: Twelve (12) months from date of Substantial Completion:
 - a. The Elevator Contractor guarantees that the materials and workmanship of the apparatus installed by them and any subcontractor, under this contract, is first class in every respect

- and that they will make good on any defects not due to ordinary wear and tear or improper use, which may develop within one year from the date of final acceptance of all equipment.
- b. Manufacturer's warranty to repair or replace defective products or their components in the event of defects within a specified period.
 - c. Neither the final payment nor any provisions of the contract documents relieve the Elevator Contractor of any obligation provided by law. They shall remedy any defects and pay all expenses for any damage to other work.
 - d. The warranty as outlined above, for all devices, starts from the date of final acceptance of each device, by the Owner, of all work specified and intended under these contract documents.
 - e. All other services as required by Section 14 20 00, 1.5L-M and Exhibit A.

J. MAINTENANCE

- 1. General:
 - a. All maintenance is performed according to the guidelines stated in manufacturer's Maintenance and Operations manuals.
 - b. Maintenance records for each device, including lubrication logs, check charts, are provided in each control room.
- 2. Construction Maintenance:
 - a. Upon substantial completion of a device, after receiving sign-off from the governing authorities and acceptance from Consultant and/or Contractor, the device may be accepted for service before completion of the entire project.
 - b. During the Construction Maintenance period, the necessary preventive maintenance is performed on a scheduled basis.
 - c. Provide the necessary protection of the hoistway entrances and sills, hoistway fixtures, cab interiors and fixtures and car door sills.
 - d. Replacement or repair of components, due to misuse by others, is the responsibility of the Contractor/Owner.
 - e. Perform emergency callback service during normal working hours.
 - f. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of sixty minutes or less.
- 3. Warranty Maintenance:
 - a. Upon final acceptance of each device, subsequent to receiving acceptance and sign-off from the governing authorities and final acceptance, each device is accepted for full operation.
 - b. The warranty maintenance period begins for each device when all conditions in the above paragraph are met and will continue for a specified period.
 - a) Warranty Maintenance Period may begin at different times for each elevator.
 - c. The warranty maintenance program includes the following:
 - a) Monthly examinations, including adjustments, cleaning, and lubrication of equipment.
 - b) 24-hour Emergency Call back service is provided at no additional cost to Owner.
 - c) Replacement of components as required, using only components produced by the original manufacturer.

- d) Each control room is equipped with a lockable storage cabinet to contain the necessary spare parts.

1.3 ELEVATOR BASIC REQUIREMENTS

- A. All elevator systems must be designed by a professional vertical transportation (VT) consultant which is approved by SeaTac.
- B. Elevator analysis should be performed prior to Schematic Design phase to determine the appropriate elevator quantity, capacities and speeds.
- C. Avoid single elevators. Redundancy of elevator systems is needed to account for routine and unplanned shutdowns.
- D. Elevators shall utilize non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary. Decaying circuitry, limiting access codes and hand-held plug-in units of proprietary design will not be accepted.
- E. Elevators shall be designed and built to have a minimum component service life of thirty (30) years.
- F. Machine and Control Room locations are to be designed to avoid exterior rooms and below-grade levels.
- G. Outdoor elevator hoistway design to minimize condensation levels.
- H. Approved elevator types are:
1. Machine-Room-Less (MRL) Traction
 2. Overhead Traction
 3. [DESIGN TEAM: HYDRAULIC ELEVATORS MUST BE APPROVED BY FACILITIES & INFRASTRUCTURE PRIOR TO DESIGN.]
- I. Minimum Standards for elevator type and speeds in feet per minute (FPM) are as follows:

# Floors	Up Speed	Down Speed	Type
2-3 Floors	150 FPM	150 FPM	MRL Traction (alternate for Holeless Hydraulic, if approved by F&I)
4-5 Floors	200 FPM	200 FPM	MRL Traction
6+ Floors	350 FPM	350 FPM	MRL Traction or Overhead Traction
4+ Floors and Capacities over 5,000 lbs.	200 FPM	200 FPM	Overhead Traction

- J. The MRL and Overhead Traction elevator motor drive shall recover potential energy released during motion and return it to the power grid. (Regeneration)

- K. Holeless Hydraulic (If approved by F&I) approved manufacturers are as follows:
1. Minnesota Elevator Incorporated.
 2. Mitsubishi Electric Co.
 3. Otis Elevator Co.
 4. Schindler Elevator Co.
 5. TK Elevator Co.
- L. MRL and Overhead Traction Elevator approved manufacturers are as follows:
1. KONE Inc.
 2. Mitsubishi Electric Company Co.
 3. Otis Elevator Co.
 4. Schindler Elevator Co.
 5. TK Elevator Co.
- M. Passenger Elevators shall have the following capacities and speeds:
1. Capacity: Minimum of 4,000 pounds
 2. Doors: Center-Opening 4' wide x 8' tall.
- N. Service Elevators shall have the following capacities and speeds:
1. Capacity: Minimum of 5,000 pounds
 2. Doors: Two-Speed, Side Opening 4'-6" wide x 8' tall.
- O. Elevator Special Operations:
1. Independent Service: activate operation through a key switch in service cabinet
 2. Standby Power:
 - a. Where emergency power is provided to the elevator main disconnects and required by the Building Code the elevator installation shall comply with the Emergency Power Operation requirements of ASME A17.1 as modified by any superseding Building Code requirements.
 - b. Operation is activated by a signal from an Automatic Transfer Switch (ATS) to elevator controls indicating the Emergency power source is operational. State and run one car in each group simultaneously at contract car speed and capacity.
 3. Nudging Operation: After beams of reopening device are obstructed for a predetermined interval of 45 seconds, sound warning signal and attempt to close doors.
 4. Card/Proximity Reader Security System: provide provisions inside all cars for reader unit.
 - a. Interface to Building Management System:
 - b. The elevator monitoring system shall be capable of interfacing and exchanging data with third-party building management systems including Siemens, Landis AND Staefa, Johnson Controls, SCADA.
 - c. Information shall be exchanged by Modbus protocol, open protocol or other suitable

methods as required.

P. Car Operating Panels:

1. Passenger Elevators – Two car operating panels for front opening doors and four car operating panels for front and rear opening doors.
2. Service Elevators – One car operating panels for front opening doors and two car operating panels for front and rear opening doors.

Q. Electrical Wiring and Wiring Connections:

1. Provide 20% spare conductors for each wire type.
2. Provide wireless 5G/LTE connectivity for 2-way communication devices. [DESIGN TEAM TO CONFIRM WIRELESS 5G/LTE CONNECTIVITY IS AVAILABLE. ALTERNATE IS ANALOG PHONE SERVICE.]
3. Traveling Cables:
 - a. Flame and moisture-resistant outer cover.
 - b. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
 - c. Provide five pair of shielded wires of minimum.
 - d. Provide for future CCTV provisions two pair of shielded 18-gauge wire within traveling cable from car controller to car top junction box, plus excess loop at both ends.
 - e. Provide two pair of 18-gauge wire for CCTV power.
 - f. Identify all wiring, including spares, in controls.

R. Hoistway Entrances:

1. Entrance Assemblies:
 - a. Complete entrances bearing fire labels from a certified testing laboratory approved by authority having jurisdiction.
 - b. Provide entrance assemblies bearing 1-1/2hr label.
2. Frames:
 - a. Bolted and lapped head to jamb assembly.
 - b. Satin Stainless Steel Finish of Doors and Frames.
 - c. Provide Arabic floor designation/Tactile marking plates:
 - 1) Centered at 60" above finished floor.
 - 2) Located on both side jambs of all entrances.
 - 3) Minimum 4" in height.
 - 4) Tactile indications below Arabic floor designation.
 - 5) Permanently fastened.
 - d. Provide plates at main egress landing with "Star" designation.
3. Sills: Extruded Nickel Silver or Stainless Steel.

S. Car Equipment:

1. Frame: Welded or bolted or formed steel channel construction to meet load classification specified.
2. Safety Device: Type “B,” flexible guide clamp.
3. Platform:
 - a. Passenger Elevators: Provide Class “A” loading construction.
 - b. Service Elevators: Provide Class “C3” loading construction.

1.4 ESCALATOR BASIC REQUIREMENTS

- A. Escalators shall utilize non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary. Decaying circuitry, limiting access codes and hand-held plug-in units of proprietary design will not be accepted.
- B. Escalators shall be designed and built to have a minimum component service life of thirty (30) years.
- C. Approved Escalator Manufacturers are as follows:
 1. KONE Inc.
 2. Mitsubishi Electric Co.
 3. Otis Elevator Co.
 4. Schindler Elevator Co.
 5. TK Elevator Co.
- D. Escalator Equipment Outline:

Size:	40” Step Width
Step Speed:	100 FPM
Floors Served:	TBD
Balustrade:	Glass
Number of Flat Steps:	Three (3)

E. Escalator Design Criteria:

1. Escalators should be designed as public transportation units with the following design features:

Design Lifetime:	150,000 Hours
Step Load:	264 lbs. / step
Truss Radius:	2.7 Meter Upper / 2.0 Meter Lower
Level Steps:	3 Level Steps
Handrail Type:	“V” Type

Inner Panel Thickness:	3 mm
Skirt Panel Thickness:	3 mm

F. Escalator Operating and Safety Devices:

1. **Starting Switches:** Provide spring return type key operated starting switches for manual starting, located at landings so all the steps are within sight.
2. **Emergency Stop Button and Starting Switch:** Provide emergency stop button and starting switch at the lower and upper newel ends in a single housing.
3. **Governor:** Provide speed governor to interrupt power to the drive machine in the event the speed of the steps exceeds allowable limits per code; governor to be manual reset type.
4. **Broken Step Chain Device:** Provide a broken step chain device which causes interruption of power to the drive machine if a step chain breaks; device to be manual reset type.
5. **Broken Drive Chain Device:** Provide a broken drive chain device which causes application of the brake on the main drive shaft and stops the escalator if the drive chain parts; device to be manual reset type.
6. **Machine Area Stop Switch:** Provide a machine area stop switch, which causes interruption of power to the drive machine and brake, where access is provided.
7. **Reversal Device:** Provide a reversal stop device which causes interruption of power at the drive machine motor and brake in the case of accidental reversal of travel in the up direction; device to be manual reset type.
8. **Up-Thrust Device:** Provide a step up-thrust device which causes interruption of the power at the drive machine motor and brake should a step be dislodged against the up-thrust track at the lower curve.
9. **Step Level Device:** Provide a step level device located at the top and bottom of the escalator. Device to detect step movement displacement of 1/8" or greater at the riser end at either side of the step.
10. **Drive Connector Device:** Provide a device which applies the brake in the event the drive motor becomes disconnected from the gear box, provided the drive motor is attached by means other than a continuous shaft, coupling or toothed gearing; device to be manual reset type.
11. **Handrail Speed Monitoring Device:** Provide a handrail speed monitoring device that causes activation of the alarm whenever the speed of either handrail deviates from the step speed by more than 15%. Device to interrupt power to the drive machine motor and brake in the event over speeding continues for more than 2 seconds; device to be manual reset type.

12. Handrail Switch: Provide a handrail entry device at each newel. Operation to be in the entry direction only. Device to be manual reset type. The device interrupts the power to the drive machine motor and brake if either, an object becomes caught between the handrail and the guard, or an object approaches the area between the handrail and the guard.
13. Missing Step Device: Provide a missing step device that detects a missing step and stops the escalator prior to the gap from the missing step exiting the comb plate; device to be manual reset type.
14. Comb-Step Device: Provide a comb-step impact device; device to be manual reset type.
15. Demarcation Lights: Provide green step demarcation lights located below the step at the lower and upper landing; three fluorescent lamp fixtures as a minimum at each landing.
16. Skirt Obstruction Device: Provide skirt obstruction devices which cause interruption of the power if an object is accidentally engaged between the step and skirt, as the step approaches the comb plate.
17. Fault Finders: Provide a suitable electronic fault finding system with memory for each escalator to indicate source of trouble, should there be a failure of any components.
18. Remote Monitoring: Provide an integrated control system that continuously monitors all escalator system functions. Should the system detect a fault has occurred, the control system automatically transmits a signal via a built-in modem directly to the escalator service mechanic or local escalator service company office for an immediate response.

G. ESCALATOR WELLWAY EQUIPMENT

1. Truss: Design and construct from structural steel to safely carry entire load of moving stairway including parts, full capacity load, weight of exterior balustrade, truss coverings, and soffits as shown. Provide enclosure as required by code. Locate truss supports to suit structural conditions at upper and lower ends only. Provide seismic connection at lower end of truss to allow longitudinal movement of truss. Slip connection to accommodate movement as shown on structural drawings.
2. Drip Pans: Provide of oil tight construction beneath truss along its entire length.
3. Tracks: Fabricate from steel, reinforced and rigidly mounted to truss to ensure smooth finished track surface; maximum spacing not to exceed 4' between track supports.
4. Step Chains: High grade steel links with hardened pins connecting adjacent steps and arranged to distribute load evenly over engaged drive sprockets.
5. Steps: Steel or aluminum construction adequately reinforced to maintain alignment under maximum eccentric loading conditions and sufficiently fastened to the drive chain or link axles. Provide spray-on or applied sound reducing material on underside of each step.

6. Handrails: Handrails to be laminated canvas and rubber construction running on aluminum or steel guides fastened to and matching curvature of balustrade. The handrail color shall be black.
7. Balustrade:
 - a. General: Extended newel type balustrades without miters or angular corners at both ends of escalator. Deck end to blend smoothly over an approximate distance of 24" from its full width down to the width of the handrail guide. Make certain portions removable to permit access for lubrication and adjustments.
 - b. Design: Transparent tempered glass minimum 3/8" thick; glass in accordance with ANSI Z97.1 requirements. Glass to be cantilevered structural type without mullions; provide with vertical joints.
 - c. Decking: Fabricate from stainless steel to form flat and even surfaces with concealed fastenings.
 - d. Skirt Panels: Fabricate from minimum 14-gauge steel construction, reinforced to resist denting. Provide positive adjustment maintaining a uniform clearance to step treads of not more than 1/8". Extend beyond comb plates and wrap around base of newel. Finish skirt panels with manufacturers standard finish.
 - e. Deck Edge Return: Provide edge return assembly where decks meet architectural finishes.
 - f. Barricades: Provide barricades and fasteners as shown on drawings, and as directed by Design Team.
8. Signs: Provide Hold Handrail and Warning signs at each landing.

1.5 MOVING WALK BASIC REQUIREMENTS

- A. Moving Walks shall utilize non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary. Decaying circuitry, limiting access codes and hand-held plug-in units of proprietary design will not be accepted.
- B. Moving Walks shall be designed and built to have a minimum component service life of thirty (30) years.
- C. Approved Moving Walks Manufacturers are as follows:
 1. KONE Inc.
 2. Mitsubishi Electric Co.
 3. Otis Elevator Co.
 4. Schindler Elevator Co.
 5. TK Elevator Co.

D. Moving Walk Equipment Outline:

Size:	40" or 55" Pallet Width
Step Speed:	100 FPM
Length:	TBD
Balustrade:	Glass

E. Moving Walk Design Criteria:

1. Moving Walks should be designed as public transportation units with the following design features:

Design Lifetime:	150,000 Hours
Step Load:	264 lbs. / step
Handrail Type:	"V" Type
Inner Panel Thickness:	3 mm
Skirt Panel Thickness:	3 mm

F. Moving Walk Operating and Safety Devices:

1. Emergency Stop Button: Provide emergency stop button with audible alarm at both newel ends in a single housing with a push button type.
2. Governor: Provide speed governor to interrupt power to the drive machine in the event the speed of the pallets exceeds allowable limits or unintended reversal in direction per current code; governor to be manual reset type.
3. Broken Treadway Device: Provide a device which causes interruption of power to the drive machine if a pallet chain breaks or excessive chain stretch; device to be manual reset type.
4. Broken Drive Chain Device: Provide a device which causes the application of the brake on the main drive shaft and stops the moving walk; device to be manual reset type.
5. Moving Walk Pit Decking Floor Plate Switch: Provide a device which causes interruption of power to the drive machine and brake when access cover is opened or removed.
6. Reversal Device: Provide a device which causes interruption of power at the drive machine motor and brake in the case of accidental reversal of travel in the up direction; device to be manual reset type.
7. Missing Pallet Device: Provide a device that detect a missing pallet and stops the moving walk prior to the gap from the missing pallet exiting the comb plate; device to be manual reset type.
8. Pallet Level Device: Provide pallet level device located at the both ends of the moving walk. Device to detect pallet movement displacement of 0.125" or greater at the riser end at either side of the step.

9. Comb-Step Device: Provide a comb plate impact device which causes interruption of power to the drive machine motor and brake if comb plate is moved from the normal working position when objects are lodged between the comb plate and the treads.
10. Handrail Speed Monitoring Device: Provide a device which causes the interruption of power to the drive machine motor and brake if the handrail speed deviates from the moving walk pallet speed above the allowable speed by the governing body; device to be manual reset type.
11. Handrail Inlet Device: Provide a device at the entrance of the handrails into the balustrades which causes the interruption of power to the drive machine motor and brake if either an object becomes caught between the handrail and the guard.
12. Demarcation Lights: Provide green pallet demarcation LED lights located below the pallets at both ends. Arrange lamp fixtures parallel to the comb plates located directly below the comb plate teeth line.
13. Sign: Provide Hold Handrail and other warning signs at each landing.

G. MOVING WALK WELLWAY EQUIPMENT

1. Standard Pit Depth Moving Walkways only. No raised moving walks.
2. Drip Pans: Provide of oil tight construction beneath truss along its entire length.
3. Tracks: Fabricate from steel, reinforced and rigidly mounted to truss to ensure smooth finished track surface; maximum spacing not to exceed 4' between track supports.
4. Step Chains: High grade steel links with hardened pins connecting adjacent steps and arranged to distribute load evenly over engaged drive sprockets.
5. Handrails: Handrails to be laminated canvas and rubber construction running on aluminum or steel guides fastened to and matching curvature of balustrade. The handrail color shall be black.
6. Balustrade:
 - a. General: Extended newel type balustrades without miters or angular corners at both ends of escalator. Deck end to blend smoothly over an approximate distance of 24" from its full width down to the width of the handrail guide. Make certain portions removable to permit access for lubrication and adjustments.
 - b. Design: Transparent tempered glass minimum 3/8" thick; glass in accordance with ANSI Z97.1 requirements. Glass to be cantilevered structural type without mullions; provide with vertical joints.
 - c. Decking: Fabricate from stainless steel to form flat and even surfaces with concealed fastenings.
 - d. Skirt Panels: Fabricate from minimum 14-gauge steel construction, reinforced to resist denting. Provide positive adjustment maintaining a uniform clearance to step treads of

not more than 1/8". Extend beyond comb plates and wrap around base of newel. Finish skirt panels with manufacturers standard finish.

- e. Deck Edge Return: Provide edge return assembly where decks meet architectural finishes.
- f. Barricades: Provide barricades and fasteners as shown on drawings, and as directed by Design Team.

- 7. Signs: Provide Hold Handrail and Warning signs at each landing.

1.6 DUMBWAITER BASIC REQUIREMENTS

- A. Dumbwaiters shall utilize non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary. Decaying circuitry, limiting access codes and hand-held plug-in units of proprietary design will not be accepted.
- B. Dumbwaiters shall be designed and built to have a minimum component service life of thirty (30) years.
- C. Approved Dumbwaiter Manufacturers are as follows:
 - 1. Elevation Innovation Inc.
 - 2. MATOT Corp.
 - 3. Powerlift Dumbwaiters Inc.
- D. Dumbwaiter Design Standards:
 - 1. Capacity: 500 lbs. is maximum capacity of dumbwaiter unit.
 - 2. Speed: 50 FPM
 - 3. Operational Control: Call and Send microprocessor-based system.
 - a. Operate car from a hall button station located adjacent to the hoistway entrance at each floor.
 - b. Two buttons in each station: one button for calling the car to the floor, and one button representing the other floor served for sending the car.
 - 4. Motion Control: AC variable voltage variable frequency microprocessor-based with digital closed-loop feedback.

1.7 WHEELCHAIR LIFT BASIC REQUIREMENTS

- A. Wheelchair Lifts shall utilize non-proprietary controls for operational, motion, and motor controls; any ancillary equipment shall also be non-proprietary. Decaying circuitry, limiting access codes and hand-held plug-in units of proprietary design will not be accepted.
- B. Wheelchair Lifts shall be designed and built to have a minimum component service life of thirty (30) years.
- C. Wheelchair Lift Design Standards:
 - 1. Type: Semi-Enclosed Vertical Wheelchair Lift
 - 2. Capacity: 750 lbs.
 - 3. Speed: 17 FPM
 - 4. Drive: 1-inch O.D. Acme Screw, Class 2G, 5 pitch
 - 5. Horsepower: Min. - 3/4 HP
 - 6. Platform Size: 35 inches x 55 inches
 - 7. Control: Constant Pressure Type

8. Gate Operation: 42-inch-high self-closing and locking gates.