PART 0 DESIGN STANDARDS

0.01 GENERAL DESIGN GUIDELINES

A. Comply with ADA accessibility guidelines, applicable codes including elevator codes, Denver Wastewater Management (DWM) requirements, Denver Landmark Commission, and requirements of other Authorities Having Jurisdiction (AHJ).

B. Coordinate elevator delivery, installation, and testing and inspection periods with the construction schedule.

1. It may be necessary to require elevator submittals to be delivered early in the construction period.

C. Elevator locations

1. New two-story and taller buildings shall have elevators.
2. Two-story additions to existing buildings without elevators shall have elevators.
   a) The requirement to provide elevators in one-story additions to two-story (or taller) existing buildings will be determined by the DPS Project Manager.
   b) If it is determined that an elevator will be added in the future, consider construction of shaft and machine room for future installation of elevator.
3. Locate elevators for optimum ADA access.
4. Installation in existing split-level schools shall be placed to accommodate all levels if possible.
5. Locate elevators for multiple-function use (freight, ADA, custodial).

D. Wheelchair lifts are prohibited.

E. Limited use / limited application (LULA) type elevators are prohibited.

F. Elevator size and capacity

1. Minimum weight capacity 2,000 pounds
2. For buildings over two stories in height, coordinate with AHJs for the possible requirement to accommodate stretchers/gurneys.

G. Hydraulic elevators are preferred. If traction elevators are contemplated, confirm acceptability with the DPS Project Manager.

H. Durability and maintenance: Select only equipment suitable for potential heavy uses. (Elevators needed for occasional use by physically-impaired individuals are most often used for other uses, i.e. convenience, freight, etc.) Provide vandal-resistant buttons, indicators and panels. Lightweight equipment will not last.

I. Emergency power: Coordinate requirements for emergency power, etc., for elevator and elevator recall function as required by the AHJ.

J. Communications, controls, and alarms: Coordinate with the HVAC, electrical, telecommunications, and security systems.

K. Elevator machine rooms

1. Machine rooms shall comply with applicable code requirements for lighting, ventilation, convenience power, clearances to equipment, headroom, fire ratings, etc.
2. Machine rooms shall be adjacent to shaft wherever possible, and designed to maximize service convenience.
3. Design systems to maintain proper operating temperature for equipment in machine rooms.
   a) Coordinate possible code requirement for a dedicated machine room cooling system.
   b) Ensure that the HVAC temperature controls system monitors machine room temperature.

4. Machine room must be properly sound isolated from adjacent classrooms or offices.
5. Avoid routing of services through machine room that do not serve the machine room.
6. Do not provide a high temperature alarm in the machine room (although this was a previous standard).

M. Smoke doors: Applicable codes may require elevators to have separate smoke doors separating the elevator cab doors and the corridor.

1. If not required, do not provide elevator smoke doors.
2. Elevator smoke doors may be at the elevator openings or between a vestibule and the corridor.
3. Smoke doors at elevator doors shall be equipped with magnetic hold-open devices controlled by the fire alarm panel.
4. Coordinate with electrical for line voltage requirements.

N. Car controls: Provide one car interior control panel at each car door.

O. Hall call stations

1. Coordinate with the DPS Project Manager for type of hall call controls to be used on each project.
   a) Previous standard was keypad operation.
   b) Standard may be changing to card reader operation.
2. Cab call panel shall be equipped with a key for selection of “automatic,” “manual” or “off” operation.

P. Handrails: Cab handrails shall meet code requirements.

Q. Fire sprinklers: Determine during design phase whether the AHJs will require the machine room and hoistway to receive fire sprinklers.

1. Determine applicability of requirement for shunt-trip protection of fire sprinklers in machine room and hoistway areas, and design accordingly.

R. Fire recall feature

1. When the building fire alarm is activated, the elevator shall move to the “primary” designated floor, the doors open, and the elevator become inactive.
   a) The primary level is the “fire access” level, and shall be equipped with a “fire key” function and a “smoke vent” key function at the hall call station.
2. When the fire alarm is activated by the smoke detctyor in the corridor or vestibule at the primary level, the elevator shall go to a designated “alternate” floor, the doors open and the elevator become inactive.
3. Coordinate elevator with fire alarm system. Verify compatibility and provision of necessary equipment.

S. Custodial override: Provide a keyed override (run/stop switch) of the door open alarm feature to accommodate cleaning.

T. Emergency telephone

1. Provide vandal-resistant telephone set with emergency pushbutton dialer, and “hands free” use for microphone/speaker concealed behind perforated panel-mounted.
2. Meet ADA accessibility requirements.
3. Confirm with DPS Project Manager programming for automatic dialer emergency number (usually DPS Safety & Security at 720-423-3911).

U. Vents and vent controls

1. Verify AHJ requirements to vent elevator shafts (hoistways).
2. Where ventilation is required, ventilate to the exterior.
3. Vents shall be closed by motorized damper and open automatically by:
   a) Alarm from the elevator hoistway smoke detector (and only that detector); or
   b) A power failure
   c) A keyed switch labeled "Hoistway Vent" located adjacent to Fire Department switch at primary level.
      i) Keyed switch shall be rotating type only.

V. Keys
1. Keying: All elevators shall be keyed alike within each school. Coordinate with DPS Project Manager for type of cylinders and keyway.
2. Provide three (3) sets of elevator keys to the DPS Project Manager, including
   a) Cab hall call key
   b) Hoistway vent key
   c) Fire recall key
   d) Custodial override (run/stop) key
   e) Pit access key
3. Verify which keys are required to be delivered to the Denver Fire Department for placement in the Knox Box.

W. Each elevator pit shall have a pit ladder.

X. Sump pumps: Elevator pits shall be equipped with sump pumps only if required by the AHJ, or if necessary due to high water table or other groundwater problems. Avoid sump pumps where possible.
1. Verify requirements with AHJs including DWM.
2. Verify groundwater with the geotechnical investigation.
3. Provide power as required by the AHJ.
4. Pump shall be activated by a float switch in sump.
5. Where required by DWM, discharge from elevator sump to sanitary sewer via a sand and oil interceptor.

Y. Moisture sensors: Elevator pits may be equipped with moisture sensors only with specific approval of the DPS Project Manager.
1. Water in elevator pits leads to mold, odors, and rust.
2. If a moisture sensor is provided, coordinate alarm and reporting requirements with the security and telecommunications systems.
3. If a moisture sensor is provided, it shall be completely independent of the flood controller (if any) for the backflow prevention system. There shall be no interconnection between detection of moisture in the elevator pit and flood control for the backflow prevention system.

PART 1 GENERAL

1.01 WARRANTY

A. The elevator manufacturer shall provide an 18-month warranty.

B. Warranty shall begin upon acceptance of the elevator by the Owner.

C. The DPS Project Manager will verify that all elevator functions are operating prior to acceptance.

1.02 MAINTENANCE SERVICE

A. The elevator manufacturer shall be responsible for all service and maintenance for the duration of the warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ECCO

B. KONE

C. Minnesota Elevator

D. Otis

E. Schumacher

F. ThyssenKrupp

2.02 EQUIPMENT

A. Platform size

1. Platform size shall accommodate ADA requirements (minimum)
2. Larger platforms may be appropriate

B. Type

1. Hydraulic (standard hole or “holeless”)

C. Controls

1. Non-proprietary
2. Not patented or copyrighted

D. Keypad hall call stations: Mark II Elevator System, Model KE-1000, manufactured by Essex Electronics, Inc., Carpenteria, California

E. Emergency telephone: Wurtec Elevator Products & Service, Inc., Toledo, Ohio.

2.03 MATERIALS

A. Finishes

1. Doors and door frames
   a) Satin finish stainless steel (preferred)
   b) Painted steel
2. Cab floor:
   a) Vinyl composition tile (VCT) to match VCT elsewhere in building
   b) Carpet flooring is prohibited in elevator cabs.
3. Cab ceiling
   a) 8 foot minimum ceiling height
   b) Integral lighting: Fluorescent fixtures above ceiling panels
   c) Ceiling panels: Lay-in translucent
4. Cab walls
   a) Brushed stainless steel

b) Plastic laminate panels are prohibited.

5. Handrails: Stainless steel
6. Accessories: Pad hooks and protective wall pads

B. Control & Call Station Trim: Satin finish stainless steel

PART 3 EXECUTION

3.01 INSPECTION

A. Final inspection by the Elevator Inspector (Colorado or Denver) shall be conducted in the presence of the A/E and the DPS Project Manager.

3.02 DEMONSTRATION

A. The elevator installer shall provide complete operation training for DPS staff.

B. Training shall include (but not necessarily be limited to)

1. Enabling and disabling the elevator
2. Instruction in the operation of all safety devices
3. Instruction in the activating of all “reset” devices in any part of the elevator equipment
4. Instruction in the normal operating condition and inspection of equipment to determine if maintenance is needed
5. Instruction for reprogramming the keypad access system
6. Demonstration of all fire-alarm condition functions and the reset and clearing of these functions when alarm conditions are removed

END OF SECTION 14000