DIVISION 14 - CONVEYING EQUIPMENT

General: The guidelines and standards included in this section establish requirements for new elevators in new construction projects, new elevators in existing schools and modernization of existing elevators.

All elevators should meet current applicable elevator and building code requirements. It may not be feasible to meet certain current code requirements when an existing elevator is modernized, but the design should specifically note what aspect is not compliant, and confirm acceptance and approval in writing with the appropriate AHJ as part of the design process.

Using an elevator consultant as an independent technical expert to create bid documents is recommended, particularly when an existing elevator modernization is being planned.

14-20-00 Elevators

A. General Design Direction:
   1. Location:
      a. Where possible, locate elevator near stairs.
   2. Cab size:
      a. The elevator cab size is to be evaluated on a site by site basis to address unique facility operation's needs. If a larger cab is warranted, it should be provided for.
      b. Where possible, size to meet stretcher accessibility standards with a minimum inside dimensions 5'-5" deep, 6'-8".
      c. An absolute minimum inside dimension of 4'-3" deep by 5'-8" wide is required to meet accessibility standards when it is not feasible to increase the size of an existing elevator as part of a modernization, or include a larger size for a new elevator being added to an existing school due to present Structural or space constraints.
      d. A 10'-0" tall cab height measured from the floor to the underside of the cab canopy is desired in new elevators, and an absolute minimum 8'-0" tall cab height measured from the floor to the underside of the cab canopy is required in all instances.
   3. Capacity:
      a. District requires 3500 lb. capacity elevators unless existing conditions prohibit this possibility. The small cost differential for a smaller capacity elevator does not outweigh the benefits of the larger elevator.
   4. Elevator type:
      a. A life-cycle cost analysis should be completed to assist with determining the most appropriate type of elevator application. The minimum requirements of this analysis should include the following:
         i. Total anticipated construction costs of a hydraulic and machine-room-less traction application, which includes the cost to furnish and install the elevator as well as all related construction costs for the hoistway, machine/control room/control space and pit, and elevator lobbies.
         ii. Total anticipated operation costs of a hydraulic and machine-room-less traction application, which includes preventive maintenance costs, and general operating costs.

b. All replacement parts shall be sold on an open spare parts network to allow any certified elevator technician/elevator company to purchase all required replacement parts and software and maintain or repair elevators.

B. Cab design and accessories:
   1. Exposed doors, frame to be satin finish stainless steel for ease of cleaning and durability. Wall finishes to be plastic laminate and/or satin stainless steel and will need to be approved by District.
   2. Floor and ceiling finishes to be durable, easily maintained, vandal-resistant surfaces.
   3. Cab general lighting shall be LED type, and shall not be active until a hall call is initiated for energy savings.
   4. Cab emergency lighting to provide, minimum of 4 hours of illumination.
   5. Cab emergency exits shall be locked from the top of the cab with a contact to prevent the elevator from operating when the exit is opened to meet current code requirements.
   6. Cars to have 1½-inch O.D. diameter handrails mounted on back and sidewalls per ADA requirements.
   7. Signage and control buttons shall be provided with braille and at heights to meet ADA. Locate flag sign per signage standards (see Appendix for Signage Guide).

C. Safety and Security:
   1. Provide card key access control at all elevator entry locations adjacent to call button and inside elevators; meet accessible height requirements.
      a. Card reader in cab programmed to be able to limit access to restricted areas.
   2. See Division 28.
   3. Elevator Cab Security Camera:
      a. Interior camera required showing cab, controls and entry door.

D. Operation and Controls:
   1. Controls shall have built-in diagnostics.
   2. Elevator to return to the main floor and doors to open in event of a power failure.
   3. Chevron Clarity Hydraulic Oil, environmentally safe ISO's 32, 46, or 68, or other biodegradable oil meeting elevator manufacturer's requirements for their proposed product.
   4. See 14-28-00 for additional requirements.

E. Pit and machine rooms:
   1. Pit and machine rooms, equip with 120V, 15A electrical duplex service outlets.
   2. CCTV provisions in elevator traveling cables to allow for future install of cameras in the elevator cabs..
   3. Removable cab protective pads and Cab Pad Buttons.
   4. Elevator Machine Room, Machine Space, Control Room and Control Spaces
      a. Illumination of 19-foot candles minimum with no shadows.
      b. Access door to be self-closing, lockable.
      c. Drawings to indicate location for five-pound ABC type fire extinguisher wall mounted..
      d. Install extinguisher on strike side of elevator equipment room door.
      e. Disconnect required within 2'-0" of strike side of the machine room door.
      f. Provide a Direct-in-dial analog phone, terminated at the appropriate phone jacks in the elevator machine room.

g. Non-elevator related piping and equipment is prohibited in machine room.
h. Machine Rooms, Machine Spaces, Control Rooms and Control Spaces must be provided with a minimum of Mechanical Ventilation to maintain the machine room within the manufacturer's specified temperature range.
i. Control Spaces should only be designed if they are located in an area that cannot be accessed by students since the control space allows maintenance from outside of the space in a machine-room-less traction application.

5. Elevator Hoistway
   a. Pit illumination to be 10 foot-candles minimum with no shadows
   b. Pit sumps drain and discharge point identified on wall-mounted signs in pit and equipment room identifying where sump drain discharges in compliance with local Plumbing Codes.
   c. Pit ladders compliant with ASME A17.1, Section 2.2.4.

F. Coordination By General Contractor
1. Access control system to be installed by specialized, authorized subcontractor; coordinated with elevator, mechanical and electrical subcontractors by General Contractor.
2. Removable, OSHA approved barricades around all openings.
3. Construction power, 220VAC, single phase power for welder near the hoistway, and 110VAC power for power tools.

G. Maintenance
1. Regular examination, adjustments, and lubrication of elevator equipment to be provided by Contractor for one year following Substantial Completion.
2. Design documents should include specific definition of the following minimum standards, and should be included with all projects that include the addition of a new elevator or modernization of an existing elevator:
   a. Preventive maintenance hours
   b. Specific scope of items covered and exclusions
   c. Request for billable labor rates
   d. Required response times for callback hours
   e. Performance standards of the elevator including:
      i. Car stopping zone: ¼" maximum leveling at each floor regardless of load in either direction.
      ii. Car speed: +10%/-20% of contract speed under any loading condition for hydraulic applications, and +/-10% of contract speed under any loading conditions for machine-room-less traction applications.
      iii. Car capacity: Safely lower, stop and hold 125% of the rated load.
      iv. Pressure: Fluid system components shall be designed and factory tested for 500p.s.i. with a maximum pressure of 400p.s.i. in new hydraulic applications. Existing fluid system components should be updated as required to meet current Code requirements and have a design that exceeds the maximum pressure of new equipment in hydraulic applications that are being modernized.
      v. Car Ride Quality: Acceleration and Deceleration: Smooth constant and not less than 1.5 feet/second^2 with an initial ramp between 0.5 and 0.75 second. Sustained Jerk: Not more than 6 feet/second^3.
      vi. Airborne Noise: Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest

speed. Limit noise level in the machine room/control room/control space relating to elevator equipment and its operation to no more than 80 dBA. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.

vii. Vibration Control: All elevator equipment provided under this contract, including power unit, controller, oil supply lines, and their support in hydraulic applications, and controls, traction machines, sheaves and dead end hitches in machine-room-less traction elevators shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.

f. Request for maintenance control plan that covers maintenance intervals and processes for the installed equipment
g. Specific obsolescence language
h. Cancellation for cause terminology
i. Insurance requirements
j. Maintenance reporting requirements

H. Testing and Inspections
1. Provide copy of Operations and Maintenance (O&M) Manual for Elevator, including fault code definition, and detailed descriptions for required troubleshooting, adjusting and testing.
2. Place a 3-ring binder labeled “Test and Inspection Log Book” in the elevator machine room.
3. During one-year period after substantial completion the contractor is responsible for providing code mandated service, testing and inspection.
4. Provide mounted pocket for testing and inspection log sheets in elevator equipment room.

14-24-00 Hydraulic or Machine-Room-Less Traction Elevators

A. Rated speed to be minimum 100 feet per minute.
B. Users to include students/staff with mobility limitations, visitors, custodians, freight.
C. Install “hole-less” hydraulic style elevators only.
D. Machine Room-Less (MRL) elevator types should be considered during the design.

14-28-13 Elevator Door Functions

A. Door protection device to be 3-dimensional door control.
B. Cushion type door controls are not acceptable.
C. Automated door-nudging devices are not to be installed. Exception if not using this function it interferes with Phase II Firefighter’s operation, delete this requirement.
D. Where fire doors are required, provide recessed pocket with magnetic hold opens.

14-28-16 Elevator Controls

A. The Elevator Cab Control Panel shall contains the following switches or signaling devises:
1. Phase 2 in-cab elevator fire controls – key group #.4 located in the fire service cabinet.
2. Emergency stop switch – key group #1 located in a locked service cabinet.

3. Floor selection buttons/key switches – key group #1.
4. Run inspect switch – key group #2 located in a locked service cabinet.
5. Independent service switch – key group #3 located in a locked service cabinet.
6. Door open button.
7. Door close button.
8. Emergency phone push-to-talk button auto dial – clearly marked with instructions for use.
9. Light switch – key group #1 located in a locked service cabinet.
10. Fan switch – key group #1 located in a locked service cabinet.

B. KEY GROUPS
   1. KEY GROUP #1
      a. Manufacturers Standard
         i. Light switch.
         ii. Fan switch.
         iii. Floor selection lock out
         iv. Emergency stop switch
   2. KEY GROUP #2
      a. Manufacturers Standard – Keyed differently from #1
         i. Run/Inspection switch.
         ii. Hoist way access.
   3. KEY GROUP #3
      a. Building/Security keying (Use Manufacturers standard key switch, Card Reader Compatible)
      b. Independent service.
      c. Hall call activation.
   4. KEY GROUP #4
      a. Firefighters
      b. Cab switch.
      c. Hall switch.
   5. Key Group #1
      a. Light switch: turns cab lights on and off. Location is inside locked service cabinet in cab.
      b. Fan switch: turns cab vent fan on and off. Location is inside locked service cabinet in cab.
      c. Emergency Stop: turns elevator on and off. Location is inside locked service cabinet in cab.
      d. Floor Selection Buttons/key switch: shuts out selected floors or floor when key is in off position. (Key is removable in both positions). Location is inside cab on control panel.
      e. Emergency stop switch: stops car immediately. Location is inside locked service cabinet in cab.
   6. Key Group #2
      a. Run Inspect switch: puts elevator in inspect mode for hoist way and top of cab access. Location is inside locked service cabinet in cab.. (Key removable both positions).
      b. Hoist way access switch: functions only when car placed in “inspect mode” by run inspect switch, hoist way access switch runs the car up or down at a slow speed for top or bottom of cab access. Location is in the corridor face at near the top of the hoist way jamb frame at both terminal landings.
   7. Key Group #3 (Manufacturers standard key switch)

a. Independent service switch: standard independent service functions, doors open at the floor and remain open until they are closed by constant pressure on the car call button or the door close button. No lobby hall call service by buttons or card reader while car is in this mode. (Key removable in both positions). Locate key switch inside locked service cabinet in cab.
b. Hall call button activation switch: turns lobby hall call buttons on and off. It has no effect on card reader function. (Key is removable in both positions). Location is the elevator lobby control panel near hall call button. This should be on the same floor as the school office or on a specific floor called for on the bid documents.

8. Key Group #4
   a. Fire fighters cab switch: functions are determined by elevator code. Location by code.

C. Access control
   1. See divisions 26-28 for access control requirements.

14-28-19 Elevator Equipment

A. Communications
   1. Hands free push button emergency telephone.
   2. Telephone line shall be a dedicated line for the elevator only.
   3. Program to auto dialer to call Alarm Central Station.
   4. Programmable voice chip to identify:
      a. “School name, elevator emergency phone”.
      b. “School Address”.