14240  HYDRAULIC ELEVATORS
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SPECIFIER:  This section replaces (2004)14200.
Traffic Analysis: Before specifying elevator, obtain analysis from at least one of the specified elevator producers to ensure that elevator and door sizes and speeds will be suitable for each facility.
If the traffic analysis recommendation conflicts with the project’s Design Standards or the figures below, get direction from the PM.
Base traffic analysis on the fact that the use of elevators in schools is restricted to disabled persons under teacher supervision and by custodians.  Elevators are NOT for general use.
Then, edit the following section 14240 for each facility type, to comply with the Design Standards or as directed by the MDCPS Project Manager (PM) after traffic analysis has been reviewed.

1. For Elementary schools and early childhood centers (ECC), multiple story:
   - One 2,500 lb. capacity elevator serving Include a 42 in. wide side-opening door.
2. For K-8s, middle learning centers (MLC), middle, and high schools, multiple story:
   - One 5,000 lb. capacity elevator with 48 in. wide side-opening door.
3. If an elevator is needed for continued school operations, provide
   - One backup 2,500 lb. capacity elevator with a 42 in. wide side-opening door.
4. Provide removable padding on car walls in all elevator cars for protection from freight.
5. Specify speed for each elevator in each facility to handle the anticipated level of traffic as derived after review of the traffic analysis.
6. Minimum elevator speeds: 125 fpm in 2 story buildings; 150 fpm in buildings of 3 stories or more.
7. If there is a need for other elevators in a project, as directed in the Design Standards or by the PM, add them with their features, to the Hydraulic Elevator Schedule.

CSI MasterFormat 2004 number: 14 24 00.
An optional keynote to the Drawings follows the major product title, for A/Es using National CAD Standard.
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PART 1     GENERAL

1.1 RELATED REQUIREMENTS

A. Coordinate hydraulic elevator work with work before and after, with special attention to construction such as the following that is specified in other Specifications sections.
   1. Hoistway pits, waterproofing, walls, soffits Div 03, 04, 07
   2. Hoistway air louvers 08910
   3. Raceways for telephones 13742, 13743
   4. Access control system 13860
   5. Fire suppression sprinklers 15300, 15330
   6. Sump pumps 15450
   7. Fire detectors and alarms 16751

1.2 OVERALL STANDARDS

A. Standards Governing Hydraulic Elevator Work:
   1. Florida Building Code (FBC), with special attention to the following:
      a. Chapter 11: Accessibility, adopting 28 CFR 36, ADA Standards for Accessible Design
   2. Preemption of regulation and enforcement of portions of the ANSI/ASME 17.1 by the Florida Bureau of Elevators of the Department of Business Regulation as required by FS 399 and Florida Administrative Code 61C-5.

B. Unified Responsibility of Producer: Provide hydraulic elevator systems for this Work that are engineered, assembled, installed, maintained, and warranted by one producer / installer / maintaining entity, titled the “producer”, using components selected by that producer to perform best in meeting code and the specified requirements for that system.

1.3 HYDRAULIC PASSENGER ELEVATOR SCHEDULE

Specifier: Designate hydraulic elevators as shown below or follow numbering system shown on Drawings, such as Elevator 1, Elevator 2, etc. If there are traction elevators in the project, create one integrated schedule that distinguishes the two types. Delete one or two of the types shown following if required by Educational Specifications. If there are additional elevators of the same capacity, or if there is an elevator with different characteristics, make a new column for each. Restricted-use installations are the elevators most frequently required in Educational Specifications, to provide key access and use only by disabled persons and in hauling freight.

A. Hydraulic Elevator Schedule

<table>
<thead>
<tr>
<th>Elev __</th>
<th>Elev __</th>
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<tbody>
<tr>
<td>5000 lb</td>
<td>2500 lb</td>
<td>2500 lb backup</td>
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1. Rated capacity: 5000 lb 2500 lb 2500 lb
2. Clear inside car dimensions (WxD) 68 x 101 in. 80 x 51 in. 80 x 51 in.
3. Overall car height (H): _______ _______ _______
4. Inside height under susp. ceiling: _______ _______ _______
5. No. of landings / floors: _______ _______ _______
6. Overall travel distance: _______ _______ _______
7. Front opening x width: 1 x ___ in. 1 x ___ in. 1 x ___ in.
8. “0” or “1” rear opg of same width: _______ _______ _______
9. State either side-opening “S” or center-opening “C” _______ _______ _______
10. Speed under full load: _____ fpm _____ fpm _____ fpm
11. Provide padding: Yes Yes Yes
12. State either restricted “R” or unrestricted “U” use: _______ _______ _______
13. Machine location: ___ floor ___ floor ___ floor
14. Machine distance (ft) from: _______ _______ _______

Hoistway. Enter “A” if machine is in machine room adjacent to hoistway

1.4 SUBMITTALS

A. Product Data:
2. Producer's product data for hydraulic elevators.
3. Letter stating elevator producer’s location, experience in manufacture and installation, and ability to execute the maintenance provisions specified below.
4. Drafts of elevator producers’ special warranties, on letterhead of each producer.
B. Shop Drawings: Show floor plan and section of each elevator hoistway and machine
room, needed inserts and service outlets, and interior elevations of cars showing location
of speakerphone, lockout key switches, operating and signal switches, interior finishes
(including car floor finish description and by whom provided)

C. Samples. Submit samples of primary exposed finish materials.

D. Closeout Submittals: Deliver the following directly to the MDCPS Facilities Operations,
Maintenance Project Operations (305 995-7945), as soon as elevator work is complete,
but before inspection of the facility for Substantial Completion, except as otherwise noted.
1. Operation & Maintenance Manuals. Bound copies of operation and maintenance
instructions, emergency information and contacts, and spare parts list;
2. Software: For elevator operation, whether proprietary or not, on readable medium;
3. Tools: Special tools and proprietary tools needed to work on elevators;
4. Keys: Hall station and other elevator keys, each with identification. Transmit copy of
keys receipt to MDCPS Central Lock Dept.;
5. Wiring diagrams: Copy for MDCPS Facilities Operations, Maintenance Project
Operations files.
6. Final inspection report and copy of Certificate of Operation: 2 copies, one to MDCPS
Facilities Operations, Maintenance Project Operations, within 5 days of report, deliver
the other copies, with transmittal letter, to Miami-Dade County Office of Elevator
Safety (MDC OES).
7. Copy of Certificate of Operation from MDC OES, within 5 days of issue.

E. Notice of Delivery of Closeout Submittals: Letter to Board’s Project Manager listing date
delivery of each closeout submittal item to MDCPS Facilities Operations, Maintenance
Project Operations, approved and signed by the receiving person. This notice will serve
as the receipt due to the PM for project closeout.

F. Provide and Post, each in a frame with damage-resistant transparent cover:
1. Wiring diagrams: Near each elevator machine, where visible to maintenance persons.
2. Certificate of Operation: Original, in each elevator car:

1.5 QUALITY ASSURANCE

A. Pre-Installation Conference: Discuss and coordinate mechanical rooms, elevator
hoistways, sump pits, and other items having an impact on the installation of hydraulic
elevators, and inspection requirements for obtaining an elevator permit from MDC OES.

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SPECIFIER: Include the following paragraph for projects that consist of either an elevator ADA upgrade,
a replacement fire alarm system, or an upgrade of the fire alarm system. A simple expansion of the
system or adding devices or zones will not require recall and fire service compliance modifications.
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B. Provide or upgrade, as required, elevator controllers, necessary equipment, and
connections to comply with recall and fire service requirements of MDC OES.

1.6 SECURITY AND KEYS

A. Delivery of Keys. Deliver the number of each specified key type, labeled, directly from the
elevator producer to the MDCPS Facilities Operations, Maintenance Project Operations,
305 995-7945, and through no other hands. Obtain receipt.
1. Transmit 3 copies of the receipt for this delivery as follows: To the Contractor, the MDCPS Central Lock Dept., and the MDCPS Project Manager for this project.
2. MDCPS Facilities Operations, Maintenance Project Operations will deliver keys, to the school’s principal for inclusion in the facility’s key cabinet.

1.7 MAINTENANCE SERVICE

A. Maintenance and Callback Service by Elevator Producer:
   1. Scope: Full maintenance service by skilled, competent staff of elevator producer.
      a. Provide preventive and routine lubrication, cleaning, and adjusting as needed to keep elevators operating properly.
      b. Repair or replace worn or defective components.
   2. Duration of maintenance: 12 months after issue date of Certificate of Operation.
      a. Maintenance schedule: Perform each month during normal working hours.
   3. Callback service: Include 24/7 (24 hours a day, 7 days a week) service within 2 hr after phone, fax or email notification by MDCPS staff or by elevator installer.
   4. Instruction and Equipment: Continue instructing the Board’s personnel in proper operation and maintenance of elevators. Continue providing tools, instructions, computer software and other items needed to troubleshoot and maintain elevators.
   5. Excluded from elevator producer’s responsibility: Accidents, vandalism and abuse.

1.8 SPECIAL WARRANTIES

A. Provide no-dollar limit special warranties, signed by Contractor and elevator producers, agreeing to replace, repair, or restore defective materials and installation of elevator work during the specified special warranty periods.
   1. Special warranty of proprietary products: Elevator systems often include software, designs, components, controls, manuals, instructions, or special tools that are considered by their producers to be closely held information / techniques / products that require modification or repair solely by that producer.
   2. Special warranty of availability. The elevator producer, and all if its suppliers, for this Work shall warrant to the Board, for the life of the elevator, that it and its suppliers will provide unlimited proprietary information and products – including such proprietary items as software and software upgrades, designs, operation and maintenance manuals, instructions, and special tools – as needed to operate, maintain, repair and modify the elevator system.

B. Defective is defined to include, but not limited to, operation or control system failures, performance below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, need for excessive maintenance, abnormal noise or vibration, and similar conditions not normally encountered elevator use.

C. Special Warranty Periods: Starting from date of substantial completion or issuance of the certificate of operation by MDC OES, whichever occurs later,
   1. For correction of defects in the elevator system: 2 years.
   2. For supplying of proprietary software and software upgrades, designs, operation and maintenance manuals, instructions, and special tools as needed for the Board to operate, maintain, repair and modify the elevator system: Life of the elevator.

D. Provide coincidental no-dollar limit special warranties, for the same special warranty periods, for the following specified products:
   1. Controllers, valves and door operators.
PART 2    PRODUCTS

2.1 HYDRAULIC ELEVATOR PRODUCERS

A. Provide hydraulic elevator system (incorporating specified controllers, valves and door operators) by:
   1. Archer Elevator Corp.
   2. Canton Elevator Inc.
   3. KONE Inc.
   5. Otis Elevator Co.

B. Provide controller component of hydraulic elevators by:
   1. Motion Control Engineering Inc.
   2. Elevator Controls Inc.
   3. Producer of elevator system specified above.

C. Provide oil valve component of hydraulic elevators by
   1. Elevator Equipment Co,
   4. Producer of elevator system specified above.
   5. Equal product reviewed and approved by the A/E and the MDCPS Facilities Operations, Maintenance Project Operations.

D. Provide door operator component of hydraulic elevators by:
   1. GAL Manufacturing Corp.
   2. MAC Inc.
   3. Producer of elevator system specified above.

2.2 HYDRAULIC PASSENGER ELEVATORS [14240.hpe1, 14240.hpe2, etc.]

A. Description. Electric powered hydraulic cylinder elevator system.
   1. Machine room location. Where possible, locate next to elevator's hoistway.
   2. Leveling: Automatic 2-way self-leveling with anti-creep control, for a leveling tolerance: 1/4 in., up or down, regardless of load and direction of travel.
   3. Cylinder: Double bottom, wrapped in non-decaying dielectric materials that will not deteriorate under soil and water conditions on site.
   4. Well: Drill well for cylinder, then concrete in place, to prevent settlement under use.
   5. Leak detection. Build-in monitoring for hydraulic fluid leakage,
   6. Pump: Electric powered hydraulic with muffler, for alternating current, with reduced voltage starting.
   7. Power supply: 480 VAC / 3 phase / 3 wire wye / 60 Hz.
   8. Emergency power. To power the protective circuit only, connect each elevator to the facility's emergency electric generator or other emergency power system.
2.3 CAR OPERATION AND CONTROL

A. Restricted Use Hall Stations. Provide vandal-resistant switches at each landing, each operated by a spring barrel / tubular type key, such as Model 4073, by Chicago Lock Co.
   1. Hall Call Station Keys. Provide 50 tubular keys, keyed alike to key code 7022.
   2. Other Keys. Provide 10 each of every other key for each key-operated device, other than Hall Stations, that is installed as part of the elevator work. Identify each of these other keys by number, purpose and the device it operates.
   3. Hall Call Station Plates: Punch with a D-punch to take D-shaped cylinder, or provide key switch anti-rotation device.

B. Inspection Control Unit. Permanently mount atop each car.
   1. Service Lights: At car top, to illuminate hoistway, with service switch.

C. Emergency Lowering. Provide a method of automatically moving car to a smoke-free landing, opening the door, then causing elevator to shut down until power is restored.

2.4 HOISTWAY ENTRANCES

A. Frames and Doors: 1-1/2 hr UL fire rated, with internal channel reinforcements, 16 ga, stainless steel in AISI No.4 brushed finish.
   1. Door operators: Direct current adjustable speed arranged to automatically open and close doors.

Specifier: Occasionally a center opening 2-speed door is needed for faster operation on an opening 48 in. or wider. Consult with PM.

2. Hoistway entrance doors: Provide 1-1/2 hr fire rated assemblies as shown on Hydraulic Elevator Schedule, each with a single leaf sliding door.
3. Hoistway door width: As scheduled for each elevator.
4. Hoistway door heights: 84 in.
5. Entrance marking plates: Tactile markings on stainless steel plates at both jambs, all landings, invisibly and securely mounted.

B. Sills: Extruded aluminum, ribbed surface.

2.5 CARS

A. Frames and Platforms: All steel construction, fully braced against racking and deflection.

B. Passenger Car Enclosures.
   1. Car entrance columns and front return, and car side of doors in each car: 16 ga. stainless steel in AISI No.4 brushed finish.
   2. Thresholds: Extruded aluminum, with ribbed top surface.
   3. Side and back walls: 16 ga. steel, galvanized or coated with rust-inhibitive enamel, and reinforced against deflection using steel channels. To the steel walls adhere sheets of high-density plastic laminate, in color selected by A/E, with hairline joints.
   4. Ceilings: Suspended stainless steel frame, inset with non-yellowing, light diffusing patterned sheets, similar in design to Eclipsis (by Kone), in color selected by A/E.
   5. Car illumination. Provide fluorescent fixtures above suspended ceiling that produce an even surface brightness and a uniform level of illumination not lower than code requirements at any point. Connect light fixtures to the facility’s emergency lighting system.
6. Handrails: At back and both sidewalls of car.
7. Protective pads and hooks: Hang removable, quilted, fire retardant pads on 3 walls.

Specifier: Be sure to specify the elevator car floor finish in an appropriate section of the Specifications. Specify, in that section, that elevators are part of that flooring provider’s scope of work – and see that the floor finish for elevators is included in the Finish Schedule on the Drawings. Matching the material, finish and color used at the ground floor landing is a frequent choice.

8. Floor: Provide structural floor suitable for and at proper level for the installation of finish flooring by another subcontractor.

C. Emergency Devices at Car
1. Emergency alarm: 80 dB(A) (at 3 ft.) alarm mounted on car-top that is activated not more than 1 second after the alarm button in the car’s operating panel is pressed.
2. Emergency lighting battery: Provide a sealed rechargeable battery.

D. Ventilation: 150 cfm electric exhaust fan in car top.

2.6 CAR OPERATING PANELS AND LANTERNS

A. Operating Panel. Brushed stainless steel plate with an array of mechanical, halo-illuminated buttons (with raised characters and Braille labels on the left).
1. Make the plate, and its buttons and their operation vandal-resistant.
2. Provide panel buttons for each landing, as well as for alarm, telephone, door-open, and door-close.
3. Provide panel key switches for lights, inspection, and exhaust fan.
4. Provide a car position indicator in or above panel.

SPECIFIER: The following vandal resistant speakerphone is mandatory. Do not delete.

5. Speakerphone. ADA-required unit, programmed to serve this facility: The phone shall be vandal resistant, with automatic dialer, activated by push button.
   a. Power the line for 24/7 use, without need for any external power source
   b. Phone shall have line seizure (line capture) capability.
   c. Provide and program auto-dialer direct voice-to-voice phone contact to MDCPS District Communication ManagementCtr. (DCOM) Alarm Desk (305 995-1551).
   d. Incorporate non-removable Grade II Braille labeling that reads: EMERGENCY PHONE
      PUSH TO TALK — AUTOMATIC SHUTOFF.


B. Lantern and Chime. Provide in car entrance, visible from landing. Lantern shall show direction of car travel when doors open, at which time a chime shall sound: one ring for UP, two rings for DOWN.

2.7 HALL FIXTURES

A. Elevator Operating Station, at all landings. Brushed stainless steel plate, vandal-resistant, with key switch for each elevator.

B. Fire Service Key Box. Install a SupraMax key box above the main landing hall station. Locate box 72 in. above finished floor.
2.8 OPERATION AND CONTROL OF ALL DOORS

A. Door Operators. Closed loop permanent magnet VVVF type, opening hoistway and car doors simultaneously. Cushion doors at both travel limits.
   1. Provide electromechanical interlock at each hoistway door to prevent operation of elevator unless all doors are closed and locked.
   2. Provide electric contact at car doors to prevent operation of elevator unless car doors are closed.

B. Door Hangers and Tracks. Power operated, adjustable, with polyurethane tired wheels with bearings and sealed-in permanent lubrication.

C. Electronic Door Safety Device. Electronic sensor, the full height of each door leaf, holding doors open while people are in the way and stopping / reopening for any obstruction.

PART 3 EXECUTION

3.1 INSPECTION

A. Before starting installation of the work of this section, the elevator producer shall, in the presence of the Contractor, inspect the areas of the work to be performed to ensure that earlier construction is complete and that detrimental conditions and workmanship have been corrected in ways acceptable to the elevator producer. Inspect especially the following critical areas of earlier construction:
   1. Inspect pits to confirm that:
      a. Waterproofing is sufficient to provide a dry pit area.
      b. Pit does not depend on sump or pump to meet pit dryness requirement.
      c. Concrete floor is level except for drainage slope to sump.
      d. No PVC or other plastic pipe is in pit.
      e. A galvanized steel ladder is provided at each elevator pit.
      f. Illumination is provided by 2 moisture-proof protected light fixtures and a grounded GFI duplex electric receptacle.
   2. Each sump shall be at least 24 in. deep x 18 in. ID or 18 x 18 in. clear width, with:
      a. Sump pump in place, hooked up to power and to remote shut-off safety switch;
      b. A non-corroding metal grating or perforated lid in place over entire sump opening.
   3. Confirm that hoistways walls and soffits are of 2 hr fire rated construction and that:
      a. Hoistways have flush surfaces.
      b. That any bottom of any recess or setback in the hoistway, or the top of any item that projects 2 in. or more beyond the hoistway surface (such as a beam or floor slab), is beveled to slope 75º or more from horizontal.
      c. There is a vent, at least 3 ft² in area, from hoistway to exterior for each elevator car.
      d. Where hoistways serve more than 3 floors, positive pressure and vents are provided to convey smoke and hot gases from hoistways to exterior.
      e. Door entrance frames, headers, and sills are grouted solid for 1-1/2 hr fire rating.
      f. Voids, holes, slots, and other openings in hoistway have been grouted and pointed up to achieve 2 hr fire rating.
      g. Nails, snap ties, form straps, other projecting metal items and all wood items have been removed from hoistway.
   4. Check Elevator Equipment Room for:
      a. 2 hr fire rating at walls and soffit.
b. 1-1/2 hr fire rated door with a 24 x 24 in. fusible link louver.
c. No plumbing pipes inside Equipment Room.
d. Air conditioning performance that ensures that temperature and humidity can be maintained at 55 ºF minimum, 90 ºF maximum, and RH at 75% maximum, or more stringent levels as required by the elevator producer.

5. Check electrical installation to ensure that the following has been completed:
   a. Conduit with a pull-string from main telephone room has been run to the elevator equipment room.  MDCPS Information Technology Services (ITS) will install wire to the elevator equipment room jack.
   b. Speakerphone (Smart Dial) has been connected to telephone for direct voice-to-voice contact with MDCPS Security Office.

3.2 PREPARATION

A. Do not start elevator work until earlier construction and conditions detrimental to the timely and proper installation of this work have been completed and corrected by the entities that have performed earlier work, in ways acceptable to the elevator producer.

3.3 INSTALLATION

A. Perform work following the current installation requirements of the elevator producers and each component producer. Obtain approval of shop drawings before proceeding with fabrication. Coordinate with MDCPS ITS for ITS connection requirements. Adhere to the following scope and workmanship requirements:
   1. Prime and paint exposed metal work that does not have a bright metal or baked enamel coating unless otherwise specified.  Unless otherwise selected by A/E, color shall match that of adjacent work.
   2. Install car control panel, control buttons, emergency devices, and railing following ADA accessibility requirements.
   3. Install wiring from elevator equipment room phone jack to the elevator speakerphone.

B. Leveling tolerance: 1/4 in., up or down, regardless of load and direction of travel.

C. Instruction and Equipment: Instruct the Board's personnel in proper operation and maintenance of elevators.  Provide tools, instructions, computer software and other items needed to troubleshoot and maintain elevators.

3.4 FIELD QUALITY CONTROL

A. Testing and Correction of Defects.
   1. Upon installation of equipment and when in full operating condition, test elevators to demonstrate compliance with codes, regulations, and Construction Documents. Make performance evaluation tests following detailed checklists for each elevator.
   2. Correct defective work if elevator system departs from requirements of Construction Documents, is dangerous, noisy, or otherwise objectionable in operation.
   3. Provide labor and equipment for on-site observations, testing, retesting, and remedying defects until elevator work is accepted, as well as during Correction of Work and Special Warranty periods, all in addition to the requirements of Maintenance and Special Warranty specified in PART 1 of this section.
   4. Do not use each elevator until the elevator inspection has been performed and certificate from Miami-Dade Office of Elevator Safety has been posted.///