

Revised: April 2018

## 14 2000 – Elevators

### PART 1. GENERAL

- 1.01 The Elevator Standards apply to a variety of conditions and types of elevators. The program statement for the project will outline preliminary requirements for vertical transportation systems. The A/E is fully responsible for code compliance for the design and specification of the elevator, machine room and shaft as part of the Contract Documents for the project. The University Architect will review all variances and applications for installation or alterations for elevators.
- 1.02 NIU DeKalb campus Physical Plant personnel maintain all of the elevators on campus. The regional campuses do not have in-house maintenance personnel and therefore rely upon vendors to maintain the equipment. For this reason, it is important that only NIU approved and non-proprietary elevator control equipment be installed and that all required tools, passwords, equipment and training necessary to service the elevator be provided by the Elevator Contractor.
- 1.03 Key and lock products for elevator controls and functions shall be Best Access, Division of Stanley Security Solutions products. The Fire Services Key and Key Switch shall be the national standard, FEOK1.

### PART 2. PRODUCTS

- 2.01 Traction Elevators
  - A. Traction elevators shall be Hollister - Whitney Elevator Company equipment.
  - B. Controllers: Use Smartrise brand/type programmable microprocessor controls. The Owner has the right of final review of the type of controller used.
  - C. Car Speed: Minimum 200 feet per minute. The NIU Elevator Consultant may require a higher speed for high-rise or group systems.
  - D. Rise: Any elevator utilizing more than 4 openings in line or having abnormally tall floor heights (more than 12 feet) will be reviewed for speed requirements.
  - E. Load weigh: Furnish load weighing in all Residence Programs and Services (RPS) applications.
- 2.02 Hydraulic Elevators
  - A. Controllers: Specify Smartrise brand/type PHC programmable microprocessor controls for single or two car applications. Use MCE's HMC system for group (3 or more car) operation applications. Use MCE's mechanical or solid-state starter

system. Manufacturer's starter systems are prohibited. Battery Lowering Device for emergency use in the event of a main power supply failure is not required.

- B. Car Speed: Typical car speed is 125-150 feet per minute.
  - C. Rise: Where the building rise is more than forty feet, or the elevator requires staggered openings on either end of the car, check with NIU Elevator Consultant for possible change in equipment or different application.
  - D. Power Units: Provide non-submersible units with direct drive or belt drive. The hydraulic pump must be located outside of the hydraulic tank in an accessible area for servicing.
  - E. Control Valve: Use only **Maxton Manufacturing** control valves properly sized for speed and capacity specified.
  - F. Hydraulic Tank: Provide internal tank heater for elevators in parking garages, unheated buildings, or where exposed to freezing temperatures.
- 2.03 Well Holes, Casings and Cylinders (Hydraulic Elevators).

- A. Use steel cased holes for hydraulic applications sized properly for each set of circumstances. Place hydraulic cylinders in the pre-drilled casing and use a laser device to align the cylinder in the presence of the NIU Elevator Consultant.
- B. Enclose hydraulic cylinders in PVC to prevent corrosion and electrolysis. Cap the bottom of the PVC liner extend it upward to a point higher than the pit floor.
- C. Back fill the cylinder with dry sand from the bottom of the cylinder to the pit floor to prevent the bottom of the casing from moving. Provide a minimum of four (4) inches of concrete at the top of the cylinder to finish the pit floor.
- D. Fasten top of cylinder so as to prevent unit from moving during operation. The elevator shall operate without the piston rubbing, bumping or otherwise contacting the inside wall of the cylinder during operation.

2.04 Pushbutton Fixtures (All elevators)

- A. Provide vandal resistant pushbutton fixtures with tamper proof screws as manufactured by Monitor Controls, Inc.
- B. Locate digital car position indicators on each floor in the elevator lobby over the door opening, adjacent to the hoistway door entrance, or contained within the hall pushbutton fixture. Use vandal resistant car direction indicators located on the elevator car to indicate direction of travel and visual arrows for car direction. Provide arrival gongs at each elevator lobby.

- C. Provide the Fire Service key switch at the main fire recall lobby pushbutton. Provide a lighted jewel to indicate Fire Service Operation. Engrave, etch, or emboss fire service instructions on the fixture cover in accordance with ASME A17.1a, Fig. 2.27.7.2. Provide switch by Adams Equipment, key number WD 01.
- D. Provide etched, embossed or engraved Fire Service Signage located on each hall pushbutton cover. Surface applied signage is prohibited.

#### 2.05 Power Door, Hall Door and Operator Equipment

- A. Use only doors manufactured by Tyler Elevator Product, Inc.
- B. Use only door operator equipment that includes drive operator, hangers, locks, closures, etc. as manufactured by GAL manufacturing Corp. Use low speed operators for three stop elevators and high speed at all other locations.
- C. Guide Rails: Guide rails for elevator car shall be machined steel, minimum 16 lb. per foot, t-type style, fabricated and installed in accordance with ANSI A.17.1. Existing guide rails shall be examined for defects, anchorage, and alignment; rework or replace as necessary.
- D. Car frame and Platform: Welded steel units. Use platforms that reflect industry standard size for cars, depending on elevator type, use, and speed. Refer to National Elevator Industry, Inc. (NEII) “Building Transportation Standards and Guidelines”, most current addition.
- E. Guides: Guides shall be roller type on car, with six inch minimum diameter car rollers. Provide rollers for speeds in excess of 50 fpm. The manufacturer shall be Hollister-Whitney Elevator Corporation.
- F. Freight Elevators with Bi-parting doors:
  - 1. Freight or service elevators shall comply with these standards except as modified or superseded by applicable codes or this section.
  - 2. Vertical car doors and hoistway doors shall be hollow metal only. Each door shall include a wired safety glass light of at least 144 square inches, with the car door light and hoistway door light in alignment.
  - 3. Power operated doors shall have high quality operators by the Peelle Company.
  - 4. Provide an electronic edge by the Peelle Company, designed for bi-parting doors.
  - 5. Provide and install a notice as follows: “Freight Elevator is for Use by Authorized Operators Only.” Use 2-inch Helvetica letters, white on red background, engraved plastic, adhesive-mounted next to each hoistway entrance at 60 inches above the floor.

6. Safety edges and safe-way devices shall be Adams Gatekeeper 2000 infrared curtain units with auxiliary photo-edges. The infrared sensor system shall be full height on the leading door edge and opposite jamb, to for a complete curtain effect.

## 2.06 Wiring and Lighting

- A. Elevator Equipment Room: Provide properly sized main line disconnect for each elevator mounted on the wall adjacent to machine room door.
  1. Provide a lockable circuit breaker for each 110/120VAC car light system in a separate panel board located in the machine room and near the main line disconnect. This panel board may be used for other loads related to the elevator and elevator machine room.
  2. Use only rigid conduit in the elevator machine room for main power equipment. EMT may be used for low-voltage control wiring.
  3. Provide adequate machine room fluorescent lighting, especially at controller and around equipment. Locate lighting to avoid conflict with installation of equipment such as motors and cables.
- B. Provide emergency backup battery lighting systems for cab interior fluorescent lighting as manufactured by the BODINE Company, Model B30.
- C. Provide a hoistway lighting system for every elevator as follows:
  1. Provide a light at the top of the hoistway and additional lights located approximately 24” above the car top when the elevator is level with a floor.
  2. Locate lights in corner of back wall where clearance allows.
  3. If there is more than one elevator in the shaft, provide two strings of hoistway lights, one on either side of the center elevator near the divider beams.
  4. Provide 4-way light switches at the elevator pit, at the top of the hoistway, and in the elevator equipment room.
  5. Locate Pit light switch next to pit ladder and located 42” above lobby floor level.
  6. Provide 13W fluorescent lamps with integral ballasts and porcelain fixture with cover.
- D. Provide a GFI duplex receptacle in each elevator pit and in the elevator equipment room.

## 2.07 Elevator Equipment Room

- A. Design: Integrate the elevator penthouses into the overall building architectural design to create a unified and compatible appearance from the exterior. Provide approved stairs for access to elevator equipment rooms. Ship's ladders and

alternating tread stairs are prohibited. Equipment unrelated to the elevator is prohibited in the elevator equipment room.

- B. Fire Protection: Elevator equipment room must meet NFPA 13, most current addition.
- C. Climate Control: Maintain temperature between 50 to 90 degrees F. See International Building Code (IBC) Chapter 30 for additional requirements if emergency power is required or provided to elevators and for machine room venting.
- D. Data/Communications: Furnish two (2) telephone lines in each elevator equipment room and one (1) data line located in a standard IU data/telephone jack. One line is to be used for the emergency call system to the control center and one line is to be used for RMS (remote monitoring system).
- E. Sound Control: If elevator equipment room is adjacent to an occupied space, provide drop seal and sound gaskets on door with sound batt insulation in walls. The A/E is responsible for determining if additional sound absorbing materials are needed inside of the elevator equipment room to meet program requirements.

## 2.08 Pit and Hoistway

- A. Pit Access: Provide a metal ladder from each pit floor starting 12" above the pit floor and extending to 48" above the lowest landing floor level.
  - 1. Locate the ladder at strike jamb side of hoistway when single panel or two speed doors are used.
  - 2. Where center opening doors are used, locate the ladder on the nearest side wall.
- B. Sump Pit: Provide a sump pit with approved cover below normal pit grade for all elevators on all campuses.
  - 1. Furnish the sump pump with integral oil sensor so that pump will not operate if hydraulic fluid is contaminating the water. Products are available from SEEWATER, Inc.
  - 2. Provide a high-water alarm and connect it to the building's Energy Management System.
  - 3. Pipe the sump pump discharge into an open gap drain connected to nearest sanitary sewer.
- C. Fire Protection: Hoistways may be exempt from the requirements for automatic fire protection sprinkler heads in fully sprinklered buildings. Verify requirements of with IBC Section 903.3.1.1.1 (Illinois Amendments).

- D. Provide a 7 inch clearance between the cleat and pit wall. This may require a larger hoistway or an offset in the wall at the pit level. Refer to ASME A17.1: Rule 2.2.4.2 for additional information.
  - E. Maintain hoistway temperature between 50 to 90 degrees F.
  - F. Items unrelated to the elevator are prohibited in the hoistway or pit.
- 2.09 Cars
- A. Interiors: Provide car interior designs and finish selections to NIU Project Architect for review.
    - 1. Install hooks and provide moving pads for each elevator.
    - 2. Install an ADA compliant handrail at the rear of the car and bump rails on the sidewalls of the car as necessary.
    - 3. Provide approved hard surface, water resistant flooring like vinyl or radial rubber flooring in the car. Carpet is prohibited inside of elevator cars.
  - B. Indicators: Locate the car digital position indicator over the transom or within the car operating panel. Place the Car Direction Indicators in the car door frame where they will be visible from the vicinity of the hall pushbutton. Every car direction indicator must be visible from the immediate vicinity of the hall pushbutton.
  - C. Provide each car operating panel with a lockable fixture cover door, key removable in the closed and locked position only.
    - 1. **Provide lock by Best.** Locate cabinet near upper end of the car operating panel.
    - 2. Inside of the door, provide a cabinet with switches for lights, service or inspection, and Fire Service.
    - 3. Provide a two-speed fan switch.
    - 4. If special security features are required, locate these functions within the cabinet.
    - 5. Engrave, etch, or emboss fire service instructions inside the fixture cover in accordance with ASME A17.1a, Fig. 2.27.7.2.
  - D. Provide each car operating panel with the following:
    - 1. Provide special language etched, engraved, or embossed pertaining to the posting of the Elevator Permit and the Capacity of the elevator.
    - 2. Provide each car operating panel with an emergency stop key switch. Position a Best cylinder with the key removable in either position and with one set of normally closed contacts near the bottom of the pushbuttons. Mark the switch with etched, engraved, or embossed “ON” and “OFF”.

3. Best lock key switches are used to lock out particular floor and/or functions. Wire controls so as not to interfere with Fire Service operation. Provide push buttons for each floor even if a key switch is required.
4. Install a two-way communication device in the telephone cabinet near the bottom of the car operating panel as manufactured by Talk-A-Phone, Model ETP-100MBV consisting of a single pushbutton, automatic dialer with appropriate indicator lights, pre-recorded message, and all other essential features necessary to comply with ADA. Where two or more elevators are in the same hoistway, provide a consolidator that allows two emergency communication devices to be operated on one telephone line. NIU personnel will program this device for communication and for automatic line testing.

#### 2.10 Hoistway Entrances

- A. Provide nickel silver or chrome plated cast iron sill plate at entrance threshold. Grout sills in place with using a non-shrink, non-metallic grout.
- B. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines. Use ¼” clearances around frame and doors as standard. Fill or slush hoistway door frames.
- C. Provide dust covers at hoistway entrances that conceal the hoistway door tracks and interlocks. Provide covers no less than the width of the door opening plus 12”. Mount covers securely to the header by use of metal screws with key-hole openings. The cover shall be capable of being removed without need of removing screws entirely.
- D. Provide sight guards permanently fastened to the hoistway door and of the same color or finish as the hoistway door. There shall be no holes in the guards other than those used to fasten the guard to the door.
- E. Provided a means of emergency access for each hoistway door.
- F. Provide stainless steel hoistway doors and entrances with number four (grain line) finish. Powder coated or painted finishes may be substituted with the approval of the Project Manager and Project Architect.
- G. Provide an approved automatic fire detection system (smoke detector) that will respond to visible or invisible particles of combustion connected to building fire alarm system at elevator lobbies. See IBC Section 3004 for hoistway venting requirements.

### PART 3. EXECUTION

#### 3.01 Warranty, Quality Control

- A. Prior to placing the elevator into service, NIU Elevator Consultant will schedule a final inspection of the equipment. The final inspection will include representatives of the Elevator Contractor, the A/E, the General Contractor, and the NIU Elevator Maintenance Staff.
  - B. A State of Illinois operating permit for the elevator must be issued before the elevator can be used by the General Contractor, Sub-Contractors, or Owner.
  - C. The warranty period, which includes all labor and materials, is 12 months after substantial completion. The substantial completion date is the date that the State of Illinois operating permit is issued.
  - D. All Emergency service requests will be initiated by the NIU Public Safety and Heating Plant.
  - E. The Elevator Contractor is requested to respond to emergency service requests within 24 hours.
- 3.02 Inspection During Warranty Period

- A. The Elevator Contractor shall schedule and pay for all State of Illinois elevator inspections, including callback inspections for the first 12 months.
- B. The Elevator Contractor shall provide monthly service inspections during the warranty period and perform monthly testing of the Fire Service, alarm bell, and emergency communication device. Provide a copy of the service inspection form to the NIU Elevator Consultant.
- C. At the 10-month anniversary date, the NIU Elevator Consultant shall contact the Elevator Contractor to arrange an inspection of the elevator equipment. The NIU Elevator Consultant and the NIU Elevator Maintenance Staff shall verify all major component parts are operating as designed.
- D. Any deficiencies found shall be corrected prior to the warranty expiration, or the warranty will be extended until such deficiencies are corrected and the elevator re-inspected.

End of Division 14 2000

**This section of the NIU Design and Construction Standards establishes minimum requirements only. It should not be used as a complete specification.**