SECTION 14 00 00 - CONVEYING EQUIPMENT
Indiana University Bloomington and Regional Campuses (except IUPUI)

This Standard applies to a variety of conditions and types of elevators and lifts. Escalators and wheel chair platform lifts are not covered by this standard. 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. In all instances, utilize the latest adopted codes that apply to each discipline.

The University Engineer will review all variances and applications for installation or alterations for elevators.

A. See http://www.in.gov/dhs/2374.htm for a listing of information pertaining to Elevator/Amusement Ride Safety Section of the State of Indiana and downloadable applications.

B. For alterations, the correct Code and Code Year of installation shall be indicated on the drawings.

C. An “Out of Service Affirmation” form shall be filled out by the Owner and submitted to rides@dhs.IN.gov

The Bloomington campus maintains all of the elevators and escalators on campus. IUPUI and 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 IU approved and non-proprietary elevator control equipment be installed and that all required tools, passwords, equipment and training necessary to service the conveying equipment be provided by the Elevator Contractor.

The policy of the UAO is to retain the services of a qualified Elevator Consultant to the design team during the design, bidding, construction and warranty period of any building requiring either a new elevator or the renovation of an existing elevator.

The IU Project Architect will coordinate the services of the Elevator Consultant and the IU Elevator Maintenance staff (at the Bloomington campus) for the following:

A. Providing traffic analysis for high-rise or complex use buildings.
B. Identifying the type, size and capacities of proposed elevators.
C. Reviewing the A/E's elevator specification.
D. Reviewing shop drawings for compliance with specifications.
E. Performing inspection services during installation.
F. Providing copies of all documentation of review and inspection reports.
G. Attending progress meetings and conducting final inspection meeting.
H. Performing warranty inspection.

The following Elevator Companies are approved vendors so long as they comply with these standards and the elevator specifications for the project:

A. The Murphy Elevator Co., Inc., 128 East Main Street, Louisville, KY 40202, (800)321-1527 www.murphyelevator.com
Platform lifts, inclined wheelchair lifts, and limited use/limited application (LULA) elevators are not covered by this Standard. Obtain written approval from the Team Leader and IU Elevator Maintenance staff before preliminary design for inclusion of these types of lifts in the Project Cost Model.

**14.1 TRACTION ELEVATORS**

**Controllers:** Use MCE (Motion Control Engineering [http://www.mceinc.com]) type microprocessor controls for hydraulic applications and SCR, 12 pulse Proforma controller product line for traction applications. Or GAL GALaxy Controller [http://www.gal.com]

**Car Speed:** Minimum 200 feet per minute. The IU Elevator Consultant may require a higher speed for high-rise or group systems.

**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.

**Load Weigh:** Furnish load weighing in all Residence Programs and Services (RPS) applications.

**Rope Grippers:** Provide Hollister Whitney rope grippers for unintended movement and ascending car over speed protection. Determine the size by the traction machine application.

**14.2 HYDRAULIC ELEVATORS**

**Controllers:** Specify Motion Control Engineering (MCE) type PHC programmable microprocessor controls for single or two car applications. Use MCE’s HMC system for group (3 or more car) operation applications. Or GAL GALaxy Controller [http://www.gal.com]

Use controller manufacturer’s solid-state starter system. Other manufacturer’s starter systems are prohibited.

Battery Lowering Device for emergency use in the event of a main power supply failure is not required.
Speeds: Typical car speed is 125-150 feet per minute. Two stop or holeless applications may successfully use 100-125 fpm.

Rise: Where the building rise is more than forty feet, or the elevator requires staggered openings on either end of the car, check with IU Elevator Consultant for possible change in equipment or different application.

Power Units: Provide non-submersible dry units with direct drive or belt drive. The hydraulic pump must be located outside of the hydraulic tank in an accessible area for servicing. A submersible unit might be considered in for a non-academic building or low-rise building where the elevator will be restricted or limited use applications.

Control Valve: Use only Elevator Equipment Corporation (EECO) control valves properly sized for speed and capacity specified regardless of type of power unit provided.
www.elevatorequipment.com (1-888-577-3326)

Hydraulic Tank: Provide internal tank heater for elevators in parking garages, unheated buildings, or where exposed to freezing. Provide hydraulic fluid viscosity control by circulating the fluid within the system until a predetermined temperature has been reached in all hydraulic elevator applications. Heating rods making direct contact with hydraulic fluid are prohibited. Provide all thermostats and control wiring as required for monitoring hydraulic fluid temperature. Do not specify biodegradable hydraulic fluid.

14.3 WELL HOLES, CASINGS & CYLINDERS

1. 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 IU Elevator Consultant.

2. 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.

3. 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.

4. 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.

5. Elevator manufacturers who utilize a different approach than the above may submit their standard method of cylinder protection for the Elevator Consultant’s review during pre-construction review. Cylinder protection must be acceptable to the State of Indiana, Division of Elevator Safety and comply with applicable codes.

14.4 PUSHBUTTON FIXTURES
1. Provide vandal resistant pushbutton fixtures with tamper proof screws as manufactured by Monitor Controls, Inc., Hauppauge, NY 1-877-849-4334 http://www.mcontrols.com

2. 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.

3. Provide the Fire Service key switch at the main floor fire recall lobby pushbutton. Provide switch by Adams Equipment, key number WD 01. Provide a lighted jewel to indicate Fire Service Operation.

4. Locate the fire fighter’s control buttons and key switches behind a locked cabinet located near the upper end of the Car Operating Panel. Operation instructions may be labeled or stenciled on the inside of the cabinet door where they are visible only when the cabinet door is open.

5. Provide etched, embossed or engraved Fire Service operating instructions on the pushbutton cover at the main floor where the fire fighter’s recall key switch is located.

6. Provide Appendix O signs (flame, stairs and runner) on each hall pushbutton cover.

7. Surface applied signage is prohibited except on the inside surface of the Car Operating Panel cover.

**14.5 POWER DOOR OPERATOR EQUIPMENT**

1. Provide only solid state door operator equipment that includes drive operator, hangers, locks, closures, etc. Specify GAL MOVFR operator as manufactured by GAL Manufacturing Corporation. (www.gal.com) 1-877-425-3538.

2. Use low speed operators for three stop elevators and high speed at all other locations.

**14.6 WIRING AND LIGHTING**

1. Elevator Equipment Room: Provide properly sized lockable main line disconnect for each elevator mounted on the wall adjacent to machine room door.
   A. Provide a lockable circuit breaker for each 110/120VAC car light system. Provide a separate panel board located in the machine room and near the main line disconnect. Note that separate circuits are required for each lighting or power load for elevator equipment. This panel board may be used for other loads related to the elevator and elevator machine room.
   B. Use only rigid conduit in the elevator machine room for main power equipment. EMT may be used for low-voltage control wiring.
   C. 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. A minimum of 200lx (19fc) is required.
   D. Batteries or emergency power from a generator is not required.
4. Provide emergency backup battery lighting systems for cab interior fluorescent lighting as manufactured by the BODINE Company, Model B30 (www.bodine.com) 1-800-223-5728 or approved equal as furnished by Elevator Manufacturer. An emergency light in the car operating panel is not required.

5. Provide a hoistway lighting system for every elevator as follows:
   A. 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.
   B. Locate lights in corner of back wall where clearance allows.
   C. 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.
   D. Provide 4-way light switches at the elevator pit, at the top of the hoistway, and in the elevator equipment room.
   E. Locate Pit light switch next to pit ladder and located 42” above lobby floor level.
      Locate light to provide not less than 10 foot-candles of illumination across the entire pit floor surface.
   F. Provide 13W fluorescent lamps with integral ballasts and porcelain fixture with protective cover to prevent accidental contact or breakage.
   G. Do not locate or indicate conduit, supply lines and switches in the area between the pit wall and the pit ladder rungs. Maintain full and complete clearance in this area.

6. Provide a GFI duplex receptacle in each elevator pit and in the elevator equipment room.

14.7 ELEVATOR EQUIPMENT ROOM

1. Design: Integrate the elevator penthouses into the overall building architectural design to create a unified and compatible appearance from the exterior.
   A. Provide a clear path, unencumbered with projections or obstacles, a minimum of 36” wide x 80” high to the elevator equipment room.
   B. Provide code-compliant stairs and swing doors a minimum of 36” wide x 80” high (or larger if required for equipment) for access to elevator equipment rooms.
   C. Ship’s ladders and alternating tread stairs are prohibited. Equipment unrelated to the elevator is prohibited in the elevator equipment room.
   D. Provide exterior ladders for access to penthouse roofs.

2. Fire Protection: Elevator equipment rooms may be exempt from the requirements for automatic fire protection sprinkler heads in fully sprinklered buildings when in compliance with the requirements of IBC Section 903.3.1.1.1 (Indiana Amendments).
   A. Provide fire-resistant labeled door with closer and Storeroom function mortise lockset.
   B. Provide a Class ABC 10 pound fire extinguisher in machine room mounted on a wall bracket near the entrance door. A cabinet for the fire extinguisher is not required. Provide appropriate signs above the fire extinguisher.
   C. Provide an approved automatic fire detection system (heat detector) in elevator machine rooms that is connected to building fire alarm system.
   D. If a sprinkler head is installed in the machine room, then a shunt-trip device shall be provided.
5. Climate Control: Maintain temperature between 50 to 90 degrees F. See IBC Chapter 30 for additional requirements if emergency power is required or provided to elevators and for machine room venting.

6. 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). Provide separate telephone lines to each elevator car operating panel for the “Talk-A-Phone”.

7. 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.

8. Machine Room Less (MRL) Elevators may be considered by the designer only with the approval of the Team Leader and the IU Elevator Maintenance Shop. A written request shall be made by the designer at the beginning of the preliminary design and Project Cost Model analysis to include MRL elevator(s) in the project.

14.8 PIT AND HOISTWAY

1. 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.
   A. Locate the ladder at strike jamb side of hoistway when single panel or two speed doors are used.
   B. Where center opening doors are used, locate the ladder on the nearest side wall.

2. Sump Pit: Provide a sump pit with approved cover below normal pit grade for all elevators on all campuses.
   A. Sump pumps are required to be installed at the time of construction in all buildings that have fire sprinkler systems.
   B. 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. (www.seewaterinc.com) 1-888-733-9283.
   C. Provide a high-water alarm and connect it to the building’s Energy Management System.
   D. Pipe the sump pump discharge into an open gap drain connected to nearest sanitary sewer.

3. 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 (Indiana Amendments).

4. Provide an approved automatic fire detection system (heat detector) connected to building fire alarm system at the top of the elevator hoistway.

5. See IBC Section 3004 for hoistway venting requirements. Review the proposed hoistway venting methods with the local fire protection officials.
6. Provide a method for maintaining the elevator hoistway between 50 to 90 degrees F if it is not located within the interior of the building.

7. Items unrelated to the elevator are prohibited in the hoistway or pit.

14.9 CARS

1. Interiors: Provide car interior designs and finish selections to IU Project Architect for review.
   A. Install hooks and provide moving pads for each elevator.
   B. Install an ADA compliant handrail at the rear of the car and bump rails on the sidewalls of the car.
   C. Provide approved hard surface, water resistant flooring like vinyl or radial rubber flooring in the car. Carpet is prohibited inside of elevator cars.

2. 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 visible from the vicinity of the hall pushbutton. Every car direction indicator must be visible from the immediate vicinity of the hall pushbutton.

3. Provide each car operating panel with lockable cover doors, key removable in the closed and locked position only.
   A. Locate the first lockable cover near upper end of the car operating panel. Provide lock by Adams Equipment, key number WD 01. Inside of this cover door will be the Fire Service controls. Engrave, etch, or emboss fire service instructions inside the fixture cover in accordance with ASME A17.1a, Fig. 2.27.7.2.
   B. Provide a second lockable cover with a cylinder for a Best core. Inside of this cover provide switches for lights, a two-speed fan switch, an Emergency Stop, the Independent Service and provide tools for hoistway access. For Independent Service, provide 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”.
   C. If an 110v AC receptacle (GFCI) or other special security features are required, locate these functions within the cabinet.

4. Provide each Car Operating Panel (COP) with the following:
   A. Provide special language etched, engraved, or embossed pertaining to the posting of the Elevator Permit and the Capacity of the elevator. See appendix drawings for exact wording, color, and size requirements.
   B. Where special 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.
     1. Coordinate with IU Elevator Shop and Team Leader for installation of high security systems or swipe card readers.
   C. Install a two-way communication unit at the bottom of the car operating panel as manufactured by Talk-A-Phone, Model ETP-103V (http://www.talkaphone.com/), 888-636-8877. This unit consists of a single pushbutton and is mounted behind the COP. It includes an automatic dialer with appropriate indicator lights, pre-recorded message, and all other essential features necessary to comply with ADA.
14.10 HOISTWAY ENTRANCES

1. Hoistway entrances shall open into an interior lobby or a fully enclosed entrance that is protected from weather, wind-blown dust or debris, and extremes of hot and cold temperatures. Provide adequate floor space to accommodate the number of people who may be using the elevator plus an equal number of people who may be waiting to use the elevator.

2. Provide extruded aluminum car and lobby sill at the entrance threshold for any elevator up to and including 4000# capacity. For elevators above this, a nickel silver sill plate may be specified at the entrance threshold depending upon the anticipated use. Grout sills in place with using a non-shrink, non-metallic grout or anchor sills to an angle iron support properly sized and supported to suit the sill application.

3. 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 located in masonry walls with mortar as required to maintain elevator entrance fire rating. Coordinate this work with the General Contractor.

4. Provide dust covers at all 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.

5. Use only GAL hoistway door hanger tracks and header equipment.

6. Provide sight guards permanently fastened to the hoistway door and of the same color or finish as the hoistway door. There shall be no burrs, sharp edges, or holes in the guards other than those used to fasten the guard to the door.

7. Provided a means of emergency access for each hoistway door. Provide Residence Programs and Services buildings with special Tri-Lock plugs with key as selected by the Owner.

8. Provide stainless steel hoistway doors and entrances with number four (grain line) finish.

9. 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 outside of the hoistway.

14.11 WARRANTY

1. Prior to placing the elevator into service, contact the IU Elevator Consultant to 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 IU Elevator Maintenance Staff.

2. A State of Indiana operating permit for the elevator must be issued before the elevator can be used by the General Contractor, Sub-Contractors, or Owner.
3. The warranty period, including all labor and materials is 24 months after substantial completion. The substantial completion date is the date that the State of Indiana operating permit is issued.

4. Emergency service requests during the warranty period will be initiated by the IU Control Center (or Physical Plant Director at Regional Campuses).
   A. At the Bloomington Campus, the IU Elevator Maintenance Staff will verify the condition of the elevator. They will then communicate to the Elevator Contractor the status of the elevator by telephone, fax or email and obtain the Elevator Contractor’s approval before proceeding with any emergency work on the elevator.
   B. Any unauthorized work performed by the IU Elevator Maintenance Staff may void the warranty for the elevator.

5. The Elevator Contractor is requested to respond to emergency service requests within 24 hours.

14.12 INSPECTIONS DURING WARRANTY PERIOD

1. The Elevator Contractor shall pay for the cost of the annual testing at the 12th and 24th month after Substantial Completion. A copy of the annual testing report shall be furnished to the IU Elevator Consultant and the IU Elevator Maintenance staff, or Physical Plant Director at Regional Campuses. The cost of call back inspections during the warranty period shall be paid for by the Elevator Contractor.

2. 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 IU Bloomington Service Manager or the Physical Plant Director at Regional Campuses.

3. At the 22-month anniversary date, the IU Elevator Consultant shall contact the Elevator Contractor to arrange an inspection of the elevator equipment. The IU Elevator Consultant and the IU Elevator Maintenance Staff shall verify all major component parts are operating as designed.

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 reinspected.