SECTION 14 00 01 – CONVEYING EQUIPMENT
Indiana University-Purdue University at Indianapolis

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.

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

Similar to the IU Regional campuses, IUPUI relies upon third party vendors to maintain elevators and escalators under contract. For this reason, it is important that only IUPUI 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 IUPUI maintenance staff for the following:

A. Providing traffic analysis for high-rise or complex use buildings.
B. Identifying the type, size and capacities of proposed elevators and conveying devices.
C. Reviewing the A/E’s elevator specification.
D. Reviewing shop drawings for compliance with specifications.
E. Performing inspection and punch list services during elevator installation.
F. Providing copies of all documentation of review and inspection reports.
G. Attending progress meetings and conducting final inspection meeting.
H. Performing warranty inspections prior to the end of the 12th and 24th month of the warranty period

I. Provide the IUPUI Maintenance Staff with complete 24/7 contact information at the beginning of the warranty period.

The following Elevator Companies are approved for the IUPUI Campus only:
A. The Murphy Elevator Co., Inc., 128 East Main Street, Louisville, KY 40202
   (800)321-1527  www.murphyelevator.com
B. ThyssenKrupp Elevator Company, 7217 East 87th Street, Indianapolis, IN 46256
   (317) 595-1125  www.thyssenkrupelevator.com
C. Kone, Inc, 5201 Park Emerson Dr., Suite E, Indianapolis, IN 46203 (317)788-0061
   www.kone.com
D. AMCO elevators, Inc., 35 South Pine St., Indianapolis, IN 46207 (317)231-2345
   www.amcoelevators.com
E. Mid America Elevator Co., 1116 E. Market St., Indianapolis, IN 46202
   (317)635-5500 www.midamericanelevator.com

14.1 TRACTION ELEVATORS
Controllers: Use MCE (Motion Control Engineering (http://www.mceinc.com), Elevator Controls Inc. of Sacramento, Northern, Virginia controls or GALaxy by GAL “generic” programmable microprocessor controls with AC closed loop configuration, Flux Vector drive, and velocity feedback encoder. Provide door operation control that does not require special hand held tools or computer systems to adjust.

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 Weight: Furnish load weighing in all Residence Programs and Services (RPS) applications.

14.2 HYDRAULIC ELEVATORS
Controllers: Specify programmable microprocessor like “Motion Control Engineering (MCE), Elevator Controls Inc. of Sacramento, Northern, Virginia controls or GALaxy by GAL non proprietary generic type.
Motor Starters: Use soft start or solid state motor starter system as provided by the controller manufacturer. Use of major elevator Manufacturer’s starter systems on generic controllers is prohibited.

Battery Backup: A battery lowering device may be required if emergency power is not available in building for emergency lowering of car. Verify with Program Statement, IUPUI Maintenance Staff and IU Engineering before doing preliminary cost analysis/design.

Speeds: Typical car speed is 125 – 150 feet per minute. Two stop or holeless applications may 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 units with direct drive or belt drive. The hydraulic pump and motor must be located outside of the hydraulic tank in an accessible area for servicing.

Control Valve: Use control valves properly sized for speed and capacity specified like Elevator Equipment Corporation (EECO) www.elevatorequipment.com (1-888-577-3326) or equal approved by IUPUI and IU Elevator consultant.

Hydraulic Tank: Provide internal tank heater for elevators in parking garages, unheated buildings, or where exposed to freezing temperatures. Use 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 or similar Code/State approved cathodic protection 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.

3. 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 if 3 or more cars are present.

4. Provide the Fire Service key switch at the main fire recall lobby pushbutton.
   
   A. Provide a lighted jewel to indicate Fire Service Operation.
   
   B. Engrave, etch, or emboss fire service instructions on the fixture cover in accordance with ASME A17.1a, Fig. 2.27.7.2 at the interior of the door where they may be been seen only when the door is open.

   C. Provide Firefighters switch by Adams Equipment, key number WD 01.

5. Provide etched, embossed or engraved Call Station Pictograph detailed in A17.1-2.27.9 on each hall pushbutton cover. Surface applied signage is prohibited.

14.5 POWER DOOR OPERATOR EQUIPMENT

1. Use GAL solid state door operator equipment that includes drive operator, hangers, locks, closures, etc. (www.gal.com) 1-877-425-3538 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, with fuses when required by code, for each elevator. Mount disconnect(s) on the wall and 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. For existing buildings an existing panel is acceptable.

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.

2. Meet all N.E.C. and Indiana Elevator Code regulations, including equipment clearances.

3. Provide standard car operating panel (COP) emergency lighting. For renovations without COP replacement, provide one of the following:

   A. Standard 90 minute battery backup for LED lighting,

   B. Stand alone fixture similar to Emergi-Lite PRO-2,

   C. For cab interior, fluorescent light fixture systems, with emergency backup battery:
      1. BODINE Company, Model B30 (www.bodine.com) 1-800-223-5728
      2. Nylube “Util-Lights – Combination Utility Box/Emergency Light & Bell”
         (www.nylube.com)

   D. Or IU approved non-proprietary equal as appropriate to fit existing conditions.

4. Provide a hoistway lighting system for every 3 or more stop 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 were 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.

5. Provide 13W florescent lamps with integral ballasts with polycarbonate cover where hoistway lighting is required and at car top and/or at MRL drives as appropriate and in compliance with code requirements. A minimum of100 lx (10fc) is required across the pit floor.

6. Provide a GFI duplex receptacle in each elevator pit and in the elevator machine space, control space or machine room. A separate branch circuit shall supply the hoistway pit lighting.
and receptacle(s). Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

7. Install wiring provisions for card access at the hall call station and a minimum of two extra 2-conductor cables in the traveling cable. Verify with Owner’s representative the exact number of cables and locations for card access readers.

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 sprinkler 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. The key cylinder core will be provided and installed by the Owner’s Locksmith.

   B. Provide an ABC 10 pound fire extinguisher in machine room mounted on the wall near the entrance door. A cabinet for the fire extinguisher is not required.

   C. Provide an approved automatic fire detection system connected to building fire alarm system. Include smoke detectors that will respond to visible or invisible particles of combustion. Also provide heat detectors in machine rooms and elevator shaft. Verify locations and requirements with IUPUI and IU Engineering at the time of design.

   D. If a sprinkler head is installed in the machine room, then a shunt-trip device shall be provided.

3. Climate Control: Maintain temperature between 50 to 90 degrees F in Elevator Equipment room. See IBC Chapter 30 for additional requirements if emergency power is required or provided to elevators and for machine room venting. Provide code required disconnect adjacent to equipment.
4. 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).

5. 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 cavity 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.

6. Machine Room Less (MRL) Elevators may be considered by the designer only with the approval of the Team Leader and the IUPUI maintenance staff.

   A. 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.

   B. All approved MRL equipment must be supplied complete such that it can be maintained by a third party without extra tools or cost (i.e. proprietary equipment must be left with full maintenance availability).

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, conforming to A17.1-2.2.4.

   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 most accessible to the door release rollers.

2. Sump Pit: Provide a sump pit with approved cover below normal pit grade.

   A. Verify with Owner's Representative if the sump pump shall be included with the Base Bid or if it can be installed later. If the sump pump is not provided as part of the Base Bid, then the drain connection and wiring must be provided for future installation.

   B. Furnish the sump pump with integral oil sensor so that pump will not operate if non biodegradable hydraulic fluid is contaminating the water. Like products available from SEEWATER, Inc. (www.seewaterinc.com) 1-888-733-9283 or approved non proprietary generic equal.

   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.
E. Each sump motor shall be on a separate circuit with a single non-GFI outlet provided.

F. Provide capacity per A17.1 (2011 currently 3000 gpm per pit).

3. Fire Protection: Hoistways may be exempt from the requirements for automatic fire protection sprinkler heads in fully sprinkler buildings. Verify requirements of with IBC Section 903.3.1.1.1 (Indiana Amendments).

4. 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.

5. See IBC Section 3004 for hoistway venting requirements. Review the proposed hoistway venting methods with the Owner’s Representative and local Fire Department representatives.

6. 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. Stainless steel 300 series is preferred for trim, the COP and wall panels with a textured, vandal resistant finish.

   A. Install hooks in cars 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. Install a second rail at 7” AFF on all sides.

   C. Flooring preference is hard surface flooring that doesn’t require stripping and refinishing. Alternate flooring products (such as wood or carpet) will require review and approval by the IU Project Architect and the IU Interior Designer.

   D. Use LED car light fixtures with code approved disconnects.

2. Indicators: Locate the digital car 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 two lockable fixture cover doors, key removable in the closed and locked position only.

   A. Provide Firefighters service compartment lock by Adams Equipment, key number WD 01. Locate cabinet near upper end of the car operating panel.

   B. Provide Service Compartment lock by Best for switches for lights, fans, GFI outlet, service or inspection.
C. Provide a two-speed fan switch.

D. If special security features are required, locate these functions within the cabinet.

E. Engrave, etch, apply or emboss fire service instructions inside the Firefighters compartment door in accordance with ASME A17.1a, Fig. 2.27.7.2.

4. Provide each car operating panel 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. 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”.

C. 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.

D. Install a two-way communication device in the telephone cabinet near the bottom of the car operating panel consisting of a single pushbutton, automatic dialer with appropriate indicator lights, pre-recorded outgoing message, and all other essential features necessary to comply with ADA.

E. 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. Verify with Owner’s Representative the type of dialer; IU personnel will program this device for communication and for automatic line testing.

F. Where elevator travel exceeds 60 feet, provide special communication systems as required by A17.1-2.27.1.1.4

G. Provide in the Elevator Controller a control compatible with the Owner’s Card Reader Access systems. Include extra spare conductors in traveler assembly (see 14.6.7).

14.10 HOISTWAY ENTRANCES

Note: 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.

1. Provide nickel silver sill plate at entrance threshold. Grout sills in place with using a non-
shrink, non-metallic grout.

2. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.

3. Use $\frac{1}{4}"$ clearances around frame and doors as standard. Fill or slush hoistway door frames.

4. Provide dust covers at hoistway entrances that conceal the hoistway door tracks and interlocks.

5. 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 keyhole openings. The cover shall be able to be removed without the need of removing screws entirely.

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 holes in the guards other than those used to fasten the guard to the door.

7. Provide a means of emergency access for each hoistway door. Provide custom Tri-Lock plugs to fit Owner-provided key at Residence Programs and Service buildings.

8. Provide stainless steel hoistway doors and entrances with Series 300 brushed finish. Any other finish will require review and approval by IUPUI and the IU Interior Designer.

9. Provide an approved automatic fire detection system connected to building fire alarm system at elevator lobbies. A smoke detector that will respond to visible or invisible particles of combustion shall be mounted to the underside of the ceiling at each floor level.

10. Provide elevator landing signage in compliance with ADA and IU Signage Standards to include University assigned floor numbers.

**14.11 WARRANTY**

1. The warranty period, which includes all labor and materials, is 24 hours per day 7 days per week 12 months per year for 24 months starting on the date of substantial completion. The substantial completion date is the date that the State of Indiana operating permit is issued.

2. Prior to placing the elevator into service, IU Elevator Consultant will schedule a final inspection of the equipment.
   A. The final inspection will include representatives of the Elevator Contractor, the A/E, the General Contractor, and IUPUI Maintenance Staff designees.
   B. 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 contractor shall provide a documented step by step trouble shooting protocol for IUPUI Maintenance Staff to follow before initiating a request for service. This documentation should be...
included in the O&M manual and be reviewed with IUPUI Maintenance staff during on-site training on or before the date of Substantial Completion.

4. Check-in Procedure: Contractor shall contact IUPUI Trouble Line at 317-278-1900 when they arrive on campus to provide service or routine maintenance. IUPUI Trouble line will dispatch appropriate IUPUI Maintenance Staff to meet them on-site.

5. Response Time: The Contractor shall be required to respond onsite to all calls involving service failures within two (2) hours of having received a request for such service, except as noted below.

   A. Immediately upon receiving request for service the Contractor shall provide an Estimated Time of Arrival (ETA) to allow for coordination with IUPUI Maintenance staff.

   B. An emergency call relating to entrapment shall be responded to by the Contractor within thirty (30) minutes regardless of the time of day or day of the week. An elevator service technician shall be dispatched immediately upon receipt of the emergency call.

   C. Failure to respond within these timeframes will result in IUPUI Maintenance staff contacting a third-party vendor to perform the service. The Contractor will be back charged for the third-party vendor’s fee for the service request.

   D. Contractor shall provide 24/7 emergency contact information. Contractor will respond to all service requests from the IUPUI Trouble Call line at 317-278-1900.

      1. Normal working hours are considered 7:30 AM – 4:30 PM Monday – Friday.
      2. Service requests during non-regular hours, including nights, weekends and holidays will only be required if there are no other elevators available in the building or in the case of entrapments.

   2. Contractor shall immediately notify IUPUI Maintenance staff of elevator misuse or vandalism by notifying IUPUI Maintenance Staff at 317-278-1900. These service requests may be reimbursed by IUPUI.

14.12 INSPECTIONS DURING WARRANTY PERIOD

1. The Elevator Contractor shall schedule and pay for all State of Indiana elevator inspections, including the annual testing at the 12\textsuperscript{th} and 24\textsuperscript{th} month after Substantial Completion, and all callback inspections for the first 24 months.

2. The Elevator Contractor shall provide monthly service inspections during the 24 month 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 IUPUI Maintenance Staff designee at the end of 12 months and 24 months.

3. The Elevator Contractor shall be responsible for the establishment of a preventative maintenance schedule capable of meeting the individual requirements of each elevator. The prepared schedule shall describe in detail the maintenance tasks to be performed and the
frequency, and a copy of the schedule shall be submitted to IUPUI Maintenance staff.

A. In no instance shall the maintenance be less than one time per month. A record log book of all preventative maintenance and repair work shall be maintained and kept in each machine room.

B. The log book shall be filled in to indicate the date service was performed, what service(s) were performed at the time, and by whom.

C. The log shall be kept clean, up dated, and legible.

4. At the 22-month of the warranty period the IU Elevator Consultant shall conduct an inspection of the elevator equipment with the Elevator Contractor. The IU Elevator Consultant and the IUPUI Maintenance staff shall verify all major components and 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 re-inspected.

5. During the 12th and 24th month of warranty, Contractor shall perform the Code and State required safety testing procedure. Copies of the test report shall be sent to the Division of Elevator Safety and designated IUPUI Maintenance staff personnel.

14.13 O&M MANUAL

1. 30 days before substantial completion, submit one draft copy of the O&M manual with TOC for review and approval by the Elevator Consultant and IUPUI.

2. At substantial completion, provide two O&M manuals complete with parts lists, wiring diagrams, basic trouble shooting protocol for IUPUI Maintenance Staff, monthly preventative maintenance requirements, all tools and diagnostic codes and any information a 3rd party service person would require.