

Louisiana State University Design Standards

DIVISION 14 - CONVEYING EQUIPMENT

1 GENERAL TO ALL ELEVATORS AND EQUIPMENT

- 1.1 ALL elevator equipment, without exception, installed on this campus shall be non-proprietary.
 - 1.1.1 Any elevator company shall be allowed to purchase, install and maintain this equipment.
 - 1.1.2 Spare parts and controller software shall be available for sale for replacement stock to be maintained on site or anywhere the owner chooses in order to properly maintain the elevator equipment. A published readily available price list is required and the parts shall be sold free of additional requirements.
 - 1.1.3 Should a diagnostic or service tool of any kind be needed to perform any kind of adjustment or troubleshooting, the tool shall be provided with the equipment or the tool may be placed on-board and shall operate all functions. Any on-board diagnostic service tool shall have a readable digital display. This tool shall have unrestricted access to all parameters, adjustments, and flags or notifications to fully install, service, or maintain any part of the equipment. All equipment and/or software shall be the same version as issued to OEM technicians maintaining the vertical transportation system. No expiring software, partial operation or keyed access is allowed. Price to replace any tool shall be supplied during bid phase, it shall remain the price for a period of 50 years with cost of living allowances calculated when requested.
 - 1.1.4 Factory and or on-site training shall be available from the original manufacturer and shall be open for enrollment of anyone wishing to learn about the adjustment, maintenance and troubleshooting of the equipment. Training fees shall be reasonable, appropriate, and in line with other types of equipment maintenance training.
 - 1.1.5 A technical support line shall be provided by the original manufacturers during normal working hours and shall be provided to anyone as designated by the owner. Technical support shall be free of charge for the life of the equipment.
 - 1.1.6 Engineering support shall be provided by the original manufacturer to any contractor or mechanic as designated by the equipment owner.
 - 1.1.7 Complete adjuster manuals, user manuals, parts catalogs, technical guides, troubleshooting guides, engineering drawings, fault codes and parameters, circuit diagrams, wiring diagrams and prints, all in triplicate shall be provided for the equipment prior to initialization of work. In addition provide one a copy of elevator job specific controller software. All documents shall be the property of the owner and all documentation shall be available for replacement purchase at a reasonable cost to any contractor designated by the owner. All documents shall be the same version as issued to OEM technicians maintaining the vertical transportation system.
 - 1.1.8 Full maintenance control plan specific to the elevator shall be included and is the property of the owner. At a minimum shall have full maintenance instructions, with detailed information and illustrations to prevent misinterpretations. Shall include enough detail to completely maintain, trouble shoot and test the equipment installed. Each manual shall instructions and programs required to install, set-up, and adjust the elevator system or any part of the system including the passwords for all levels of interaction. This document shall be neatly bound and provided in triplicate.
- 1.2 Approved elevator control manufactures shall be Motion Control Engineering (Rancho Cordova, CA), Elevator Controls (Sacramento, CA), Galaxy (Bronx, NY), or Smartrise (Sacramento, CA). No other elevator controller shall be installed. The elevator controller shall be identified as available for purchase and installation by any licensed elevator contractor.
- 1.3 Circulation patterns and anticipated usage of the building shall determine the appropriate types and number of elevators required to ensure a fully functional building. A traffic analysis of vertical transportation equipment will be compiled and presented for review.

- 1.4 At least one ADA 3500 lb. capacity elevator that will accommodate a full size stretcher in the flat position per the IBC building code is required to serve each floor of the building.
- 1.5 State of the art microprocessor based control systems shall include as a minimum remote monitoring, independent service, firefighter service, inspection, hoistway access, and two way leveling.
- 1.6 Elevator controller shall have comprehensive means to access computer memory including status and fault logs. Controller shall have permanent indicators for important elevator statuses as an integral part of the system. Programming shall be stored in ROM or flash memory.
- 1.7 1.7 All elevator systems must be capable of remote monitoring through a universal system.
- 1.8 Provide state of the art microprocessor based AC drive control systems.
- 1.9 All motors used in the elevator system shall be guaranteed to be a minimum of 90% efficient at full load operation.
- 1.10 All equipment shall not be rated at more than 90% of the capacity of the product both electrically and mechanically. Electrically shall not exceed 90% of nameplate rating and mechanically sheave shaft loads, pumps and motors shall not exceed 90% of their maximum ratings.
- 1.11 The Firefighter Service key-switch shall be operated by the EPCO MFD-1 key and all other key-switches and locks shall be Best 7-pin cylinder key-switches and locks per LSU's priority keying.
- 1.12 Insulation applied to walls or structural members in any elevator related space shall be encapsulated.
- 1.13 Elevator shall be powered through a shunt trip circuit breaker. Heat detector initiating devices to be located within 18 inch of any sprinkler head in elevator related spaces.
- 1.14 Sprinkler piping shall be installed per code requirements. A sprinkler shutoff valve shall be provided immediately outside the elevator related sprinkled space and its location shall be marked or a sign shall be provide at the sprinkler head denoting the valve's location.
- 1.15 Paint elevator machine rooms and elevator pit walls and floors to LSU's paint standards.
- 1.16 All elevator shafts and pits that are below grade shall be sealed and waterproofed with a barrier system on the exterior walls and below the pit floors. Shall include installation of a pit sump pump with flush grate that ties into building drainage.
- 1.17 Elevators shall have telephones with hands-free operation containing an integral automatic tone dialer, be field programmable without special tools or programmers and comply with ADA guidelines. These communication devices shall be made "Vandal-Proof" construction such as Janus' VPP Emergency Communication Devices. Owner will determine dial tone location.
- 1.18 The elevator car lighting disconnect shall be fed from the emergency lighting panel.
- 1.19 All elevators and counterweights to have standard T-rails.
- 1.20 All elevators shall have roller guides. Minimum three (3) spring dampened, sound-deadening rollers per shoe on cars 4000 lb. capacity or below and six (6) rollers per shoe on cars above 4000 lbs capacity.
- 1.21 All car and hoistway sills to be nickel silver.
- 1.22 Passenger cab lighting shall be GE Lumination ET LED Luminaires (Size: 2ft x 2ft).
- 1.23 The lighting/ceiling system shall consist of 1-1/2" SS #4 tees and ells welded into a solid framework grid.
- 1.24 Clear ceiling height shall be no less than 90 inches.
- 1.25 Provide one light on smaller passenger cars and two lights on larger passenger cars and service/freight elevators.
- 1.26 Elevator door reopening devices shall be full length infrared curtain types with illuminated indicators such as Janus' Panachrome 3D Light Curtains.
- 1.27 Position indicators required on all elevators. Minimum 2" high red LED 16 segments on a black background with up and down arrows integral to unit. Located in car panel and on fire egress floor and alternate fire egress floor lobbies.
- 1.28 All elevator signal fixtures, hall and car, shall be vandal resistant, flush mounted and have engraved signage.
- 1.29 All governors to be located in the elevator machine room.
- 1.30 All elevator and counterweight safeties to be type B flexible clamp safeties.

- 1.31 Provide hoistway access escutcheons and escutcheon tubes in all elevator hoistway doors.
- 1.32 All door operators shall be sized and rated for heavy duty operation with a minimum operating speed of 2.5 feet per second.
- 1.33 All wiring installed from hatch to controller and from car to the controller shall have 10% spare wiring included.
- 1.34 Travel cable shall consist of minimum 10% spare conductors and an additional pair of shielded conductors and shall have an additional coax cable included in the cable for future needs.
- 1.35 Full size machine rooms required.
- 1.36 Elevator contractor to provide 1 year of warranty maintenance, including emergency callback service 24 hours 7 days a week. Provide LSU with a monthly maintenance inspection report.
- 1.37 At a minimum ALL state local and federal codes for elevator installation, elevator product, elevator design, electrical requirements, fire and safety requirements, building code requirements and ADA requirements are to be followed.
- 1.38 Any proprietary equipment installed shall be replaced by the contractor at no extra cost to the State of Louisiana.
- 1.39 Testing and permits required per code are the responsibility of the elevator contractor. A copy of all test reports to be turned over to LSU.
- 1.40 Submittals and shop drawings are required on all work. Generic elevator submittals will not be acceptable. Submit actual equipment being installed. Submittals shall be approved by architect and LSU.
- 1.41 All equipment and components of equipment shall be delivered in factory packaging for protection and shall be sheltered from the elements and protected from damage until installed.
- 1.42 All machine rooms are required to be conditioned to maintain the operating temperatures of the control equipment.
- 1.43 Elevator contractor is responsible for coordinating with all other trades and crafts to accomplish the acceptable finished product.
- 1.44 All equipment must be painted with rust blocking paint at the time of acceptance (either factory or field painted).
- 1.45 All elevator equipment shall be marked as required by elevator code and electrical code. Disconnects shall be marked with panel #, circuit # and room # or location of the circuit breaker from which it is fed.
- 1.46 All contracts shall hold a 10% retainage until all tools, codes, software and training have been received by LSU.

2 SPECIFIC TO TRACTION ELEVATOR SYSTEMS

- 2.1 ALL elevator machines shall be full size machines with a minimum 30 year useable lifespan and located in a full size machine room.
- 2.2 All suspension means shall be a minimum ½" steel elevator rope.
- 2.3 All machines shall be 1:1 roped.
- 2.4 No Machineromless (MRL) equipment is allowed on campus.

3 SPECIFIC TO HYDRAULIC ELEVATOR SYSTEMS

- 3.1 Pit sump pump required and shall be the oil separator type.
- 3.2 In ground jack installation is the standard.
- 3.3 No roped hydraulic installations allowed.
- 3.4 Twin post application allowed but telescopic twinpost application is not allowed.
- 3.5 Install back draft dampers in all elevator shaft vents with access to the dampers.
- 3.6 Hydraulic elevators may be provided for three (3) floors and less. All buildings above three floors shall require traction equipment.
- 3.7 All pump motors shall be rated 120 starts per hour or have a motor sized 20% greater in horsepower than capacity and speed require.
- 3.8 Provide sound isolation pads under pumping unit.

- 3.9 Hydraulic silencers with pulsation absorbing material in a blowout-proof housing required for each pump unit.
- 3.10 Oil coolers required on all campus elevator units.
- 3.11 Oil heaters required on all parking garage units and on all elevators located in equipment rooms which are exterior to the building enclosure.
- 3.12 Solid State starters required.
- 3.13 Shut-off valves required in machine room and pit.
- 3.14 Rupture valves required. Test and tag.
- 3.15 Elevator pumps, controllers and tanks shall be in an elevator machine room.
- 3.16 No Machineromless (MRL) equipment is allowed on campus.
- 3.17 Underground piping machine room to piston shall be avoided. If unavoidable the underground piping shall be coated, double wrapped with protective jack tape and installed in schedule watertight 40 PVC piping the full underground run.
- 3.18 In ground jack hole preparation
 - 3.18.1 Plumb oversized protective steel casing to accommodate the PVC casing required.
 - 3.18.2 Plumb PVC oversized sealed/watertight casing with means of testing and removal of water or oil between casing and cylinder is required.
 - 3.18.3 Jack to be installed plumb and centered on the car pick up point.

4 SPECIFIC TO FREIGHT ELEVATORS

- 4.1 Elevator cab interior lighting shall be a minimum of two LED lamps..... The fixture shall be guarded from contact with cover that will withstand the same force as required for the elevator car top.
- 4.2 Doors shall be power operated hatch and car with reopening protection.

5 REFERENCE MATERIAL

- 5.1 AISCS335 Specification for structural steel buildings – Allowable stress design, plastic design, American Institute of Steel Corporation, Inc: 1989
- 5.2 AISC S350L Load and resistance factor design specification for structural steel building: American Institute of Steel Construction, Inc: 1999, with supplement No. 1 in 2001.
- 5.3 ASME A17.1 Safety Code for Elevators and Escalators: The American Society of Mechanical Engineers; Latest adopted code by the State of Louisiana.
- 5.4 ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks: The American Society of Mechanical Engineers; Latest adopted code by the State of Louisiana.
- 5.5 ASME A17.3 Safety Code for Existing Elevators and Escalators: The American Society of Mechanical Engineers; Latest adopted code by the State of Louisiana.
- 5.6 AWS D1.1 Structural Welding Code – Steel; American Welding Society
- 5.7 ITS (DIR) Directory of Listed Products: Intertek Testing Services NA, Inc; current edition
- 5.8 NFPA 70 National Electric Code; National Fire Protection Association; Most current adopted code
- 5.9 NFPA 72 National Fire Alarm Code; National Fire Protection Association; Most current adopted code
- 5.10 NFPA 80 Standard for Fire Doors and Fire Windows; National Fire Protection Association; Most current adopted code
- 5.11 UL (BMD) Building Materials Directory; Underwriters Laboratories Inc.; current edition
- 5.12 U (ECMD) Electrical Construction Materials Directory: Underwriters Laboratories Inc., current edition
- 5.13 ADA – Building Transportation; latest adopted addition
- 5.14 IBC - International Building Code; International Code Council; latest adopted addition