

## Division 14 – Conveying Equipment

### General

The Owner will provide the QEI inspection and certification services unless noted otherwise.

### Elevators

Electric elevators are to be scoped with consideration given to project budget. For the purpose of design and specification, selection of the appropriate operable conveyance system should be prescribed with consideration given to the most cost-effective operating system meeting project requirements. As an example, hole-less hydraulic elevators should be considered, budgeted and scoped for projects with three or less stops. Consideration should be given to scoping traction elevators for projects involving more than three stops; and/or where the use of a traction elevator is more cost effective relative to long-term maintenance costs. Machine Room Less (MRL) elevators will be considered and authorized by Texas Tech for incorporation on a project-by-project basis.

Texas Tech will provide approval to the Architect regarding the proposed acceptable conveyance system to scope for each project.

Texas Tech reserves the right to restrict the scoping of proprietary manufacturer conveyance system packages.

Jacks shall be above ground for new installations.

The elevator Contractors shall be responsible to submit plans to the Texas Department of Licensing and Regulation (TDLR) and pay the review fees for all new installations and alterations. Inspectors will not be allowed to perform inspections on any new installation or alteration without a copy of the approved plans and drawings being available on site for the inspector's use during the inspection.

Before elevator contractor can begin installation, the general contractor shall provide:

1. The electrical disconnect switch.
2. Clear and completed hoistway(s).
3. Permanent machine room door(s).

Before the final QEI inspection can be performed:

1. Permanent phones must be installed.
2. Fire service/alarm completed.
3. Elevator installation is complete.

The elevators shall not be used for construction purposes or during the period prior to turning over the project to the Owner. Should the elevators be authorized for temporary use, the following conditions shall apply:

1. The Elevator Contractor shall provide a temporary acceptance form for the user to sign.
2. Neither the new installation period, or the guarantee, shall start at this time unless specifically approved in writing by the Owner.
3. The user shall provide, if job conditions require, all temporary enclosures, guards or other projection of the hoistway openings, power, signal devices, car lights, protection of any elevator entrances, cars, fixtures, and any other equipment that is installed.
4. The user shall return the elevators in the same condition they were in when placed on temporary service and shall pay the Elevator Contractor for repairs or clean up.
5. The user shall allow the Elevator Contractor to perform routine maintenance or repairs.
6. The cost of temporary service shall be negotiated between the Elevator Contractor and the user.

Submit shop drawings and descriptive data for all equipment that will be installed.

Submit samples of all exposed materials with finish and all custom fixture fabrications.

Submit written information necessary for proper maintenance and adjustment of the equipment prior to final acceptance. This includes but is not limited to:

1. Straight line wiring diagrams of as-installed elevator circuits with index of location and function of all components. Leave one laminated set in machine rooms. Provide two (2) corrected sets for Owner's file 90 days after acceptance.
2. Lubricating instructions and recommended lubricant grade.
3. Parts catalogs and maintenance manuals. Include four (4) sets per elevator.
4. Include any special tools, passwords, software package or manuals that are required for maintenance, trouble shooting, adjustments or performing safety tests of the elevators for the Owner's and Owner's elevator maintenance providers' use.
5. Include training classes for use of maintenance tools and operating procedures.
6. Deliver six (6) sets of all keys for all keyed features of the elevator system to the TTU Lockshop.
7. Log books as required by ASME A17.1 including a written maintenance control program, maintenance record book, firefighter's service operation log, record of oil usage, and a written emergency evacuation procedure (Guide for Emergency Personnel).

Comply with applicable building codes and elevator codes at the project site, including but not limited to the following:

1. ASME A17.1 Safety Code for Elevators (edition adopted by TDLR).
2. NFPA 70 National Electrical Code (NEC), current adopted edition.
3. NFPA 80 Fire Doors and Windows.

4. Americans with Disabilities Act - Accessibility Guidelines (ADAAG).
5. ASME UL 10B and ASTM E152, Fire tests of door assemblies.
6. IBC - current adopted edition, City of Lubbock, Texas
7. State of Texas, TDLR - Elevator Division.
8. Texas Accessibility Requirements, TAS, current adopted edition.
9. NFPA – National Fire Protection Association (edition adopted by State Fire Marshal).

Unless noted otherwise, the Owner will provide Qualified Elevator Inspector (QEI) for “Construction” and “Final” Inspections. Provide one (1) week notice to the Project PM for inspection scheduling. QEI will conduct periodic site visits and inspections.

Any damage of any kind to the car or the adjoining structure which may develop through performance of any tests shall be repaired at no additional costs to the Owner.

Elevator size and capacity requirements must meet or exceed ASME A17.1. Elevator speed shall be approved by the FP&C Project Manager and Design Team. The Minimum acceptable car speed for any elevator to be scoped on a project is 125fpm.

Provide warranty to replace, repair, or restore parts or components that fail or do not operate properly due to poor field or factory workmanship, engineering or design for a period of twelve (12) months from the date of signed final acceptance.

Provide monthly preventive maintenance in accordance with ASME 17.1 for the elevators for a period of 12 months after the equipment is accepted by the Owner. The maintenance service shall comprise regular examinations of the installation by competent and trained mechanics and shall include all necessary adjustments, greasing, oiling, cleaning, and supply of parts and accessories necessary to keep the equipment in good operating condition, except such replacement of parts made necessary by misuse, accidents not attributable to failure of equipment or workmanship, and negligence of the Owner. Include 24 hour-hour-per-day, 7 days per week emergency call back service, with a guaranteed response time of 1 hour or less.

Schedule all preventive maintenance visits with the TTU Physical Plant’s Elevator Supervisor and furnish all maintenance reports to the TTU Physical Plant and to the FP&C PM at the completion of each preventive maintenance inspection.

All elevator related work shall be performed only by the Elevator Contractor’s personnel, using only standard parts furnished by the Elevator Contractor and shall not be assigned or transferred to any agent. Elevator Contractor must be able to demonstrate that he has installed and maintained similar elevators to those specified and which have given satisfactory service; maintains locally an adequate stock of parts for replacement or emergency purposes; has available qualified persons to do the work. Installation shall be by mechanics directly employed by elevator contractor.

The elevator controls shall be manufactured by Motion Control Engineering, Elevator Controls, or Smart-Rise or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination. The controllers must not have any software embedded that shuts the elevator down if the equipment is not malfunctioning, and forces the Owner to call the Manufacturer for service. The elevator door controller must be manufactured by G.A.L. or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination. The door operator must be sized and programmed for each application.

Drive machines and safety equipment must be manufactured by Hollister-Whitney or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination. Dry or submersible type power units must be manufactured by Hollister-Whitney and supplied with unitized valves manufactured by Maxton Manufacturing Company or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination.

Guides for the elevator cabs and counterweights shall be manufactured by Hollister Whitney or ElSCO or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination. The guides must be sized for each application.

Door re-opening devices shall be manufactured by Janus and type Janus 200 or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination.

Contractor guarantees they will sell parts and printed circuit boards to the Owner and the Owner's Agent. The same shall not be dependent on an exchange component.

The elevator machine room should have the following as standard features, but not be limited to:

1. A self-closing, self-locking, properly rated machine room door is required. The TTU Lockshop will key the door for Elevator Machine Rooms.
2. The elevator machine room shall be properly ventilated, heated and cooled. Machine room temperature should be maintained between 55F and 90F.
3. Provide a 120-volt, 20 amp, circuit for car lights, fan and alarm circuit. This circuit must be provided with a lockable disconnect per NEC 620-53.
4. Provide adequate 120-volt receptacles in each elevator equipment room. Each outlet shall be GFCI.
5. All disconnects located in the elevator equipment room for elevator support equipment shall be fused type and lockable. Disconnect switch to be provided by electrical contractor.
6. Provide a 10-pound ABC fire extinguisher in each machine room.

7. Only such equipment directly required in the function or support of the elevator system is allowed in the machine room or hoist way. No other equipment, piping, drains, etc., is permitted in this space.
8. No floor drains are allowed.
9. Provide 40 foot candles of lighting at on the machine room floor. This exceeds ASME requirements. Light fixtures will be equipped with bulb/tube protection.
10. Provide at least one smoke detector. Upon activation, the elevators will go into recall mode. Activation of the smoke detector will recall all elevators to the designated floor.
11. Sprinklers shall be installed in elevator machine rooms in accordance with NFPA 13.
12. A heat detector must be installed within 24 inches of each sprinkler head located in the elevator machine room. The fire alarm system must function such that when the heat detector's temperature rating is reached, the fire alarm system shunt trips the main breaker prior to sprinkler activation in the elevator equipment room in accordance with ASME A17.1.
13. If elevators are powered from emergency power, interlock wiring (conduit and wire) must be provided between the transfer switch and each elevator equipment room and between each elevator equipment room.
14. One telephone line per elevator shall be installed in each elevator room. Coordinate with TTU Communications (806-742-2000).
15. Provide proper clearances per applicable codes around electrical and mechanical equipment.
16. Flexible metallic tubing will not be allowed in the machine room.
17. A minimum machine room clearance shall be 7'-0".

The elevator cab should have the following standard features, but not be limited to:

1. Specify telecommunications device in each elevator per ASME A17.1. Use of this device shall not require the opening of a door. Specify an addressable type telephone. If there is a need for protection as directed by Owner, provide phone with steel surface mounted enclosure.
2. Keyswitch Feature (Fire Fighter Service, FFS): Car and hall push buttons are activated and deactivated by security keyswitches. Key is removable only in deactivated position. Per ASME 17.1 Any key to an existing elevator shall be changed to match the key of any newly installed elevator in the same building.
3. The fire service key switch required for all elevators in a building shall be operable by the same key. There shall be a key for each switch provided. These keys shall be kept on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public. This key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521. The key shall be coded FEO-K1. The possession of the "FEO-K1" KEY SHALL BE LIMITED TO THE ELEVATOR PERSONNEL, EMERGENCY PERSONNEL AND ELEVATOR EQUIPMENT MANUFACTURES.

The elevator pit should have the following standard features, but not be limited to:

1. Pits shall be required for every elevator.

2. Ladder shall extend a minimum of 48" above lowest landing access opening. .
3. A minimum of clearance of 4 ½" from the center of the ladder rung to the wall or nearest obstruction must be maintained.
4. Start the first rung of the pit ladder 12" AFF and maintain 12" between rungs. Rungs are to be "non-slip".
5. Leading edge of the pit ladder shall be a maximum of 18" from access opening. Coordinate electrical and switches locations with other trades.
6. Provide a minimum of 20 foot candles of lighting on the elevator pit floor. Install a minimum of two lights. This exceeds ASME requirements. Light fixtures will be equipped with bulb/tube protection.
7. Pit light switch shall be located adjacent to the access opening within reach directly above the ladder.
8. All receptacles installed in the pit shall be GFI type. The receptacle for the sump pump shall be a dedicated receptacle separate from the general use receptacles.
9. Elevator "Emergency Stop" switch shall be located approximately 18" above pit opening within reach range. If the pit depth is greater than 67", an additional stop switch shall be installed and located approximately 47" above the pit floor.
10. Provide sump pumps in pits for any elevator that has Firemen's Service. The sump pump(s) shall be designed to discharge at a rate of 50 gpm. Install an approved alarm system to signal sump pump run status.
11. Sumps in pits shall be covered. The cover shall be level with the pit floor and secure.
12. Pipe sump pump discharge to the exterior of the building. The sump pump discharge piping will be 1 ¼" copper or black steel pipe. The discharge line check valve will be located above the pit cover for ease of repair. The TTU Project Design Team in conjunction with TTU Environmental Health and Safety Department will provide a design for the possibility of discharging hydraulic oil on hydraulically operated systems. Removal of water from the pit shall fall under the plumbing code. The piping shall terminate outside the building with a type of connection and at a height as directed by the TTU Design Team.
13. Do not provide a sump pump on/off switch in the elevator pit. System must be fully automatic. Each pump shall have a dedicated circuit for operation. Oil detection type sump pumps will not be allowed.
14. All electrical shall be installed in liquid tight flex conduit. Wires shall be rated for "wet" locations. Flexible metallic tubing will not be allowed in the pit.
15. Sprinklers will be installed in the elevator pit in accordance with NFPA 13.

Per NFPA 13 8.15.5, Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft. above the floor of the pit.

Per NFPA 13 8.15.5.2, The sprinkler required at the bottom of the elevator hoistway by 8.15.5 shall not be required for enclosed, non-combustible elevator shafts that do not contain combustible hydraulic fluids.

Per NFPA 13 8.15.3, Automatic sprinklers in elevator machine rooms or at the tops of hoistways shall be of ordinary or intermediate temperature ratings.

Per NFPA 13 8.15.5.4, upright, pendent, or sidewall spray sprinklers shall be installed at the top of elevator hoistways.

Per NFPA 13 8.15.5.5, the sprinkler required at the top of the elevator hoistway by 8.15.5.4 shall not be required where the hoistway for passenger elevators is noncombustible and the car enclosure materials meet the requirements of ASME A17.1, Safety Code for Elevators and Escalators.

Smoke detectors must be installed in each elevator equipment room and on every elevator landing. They must be so arranged that if activated, the elevators will go into recall mode. Activation of the smoke detector will recall all elevators to the designated floor per the TTU Fire Marshall's direction. Install a heat detector in the elevator equipment room to provide a shunt trip.

Install a smoke detector in the elevator pit. If the sprinkler head is installed above 2 ft. of the finished pit floor, a heat detector shall also be installed to provide an elevator shunt trip.

Heat detectors installed for shunt trip will be located within 2 ft. of the sprinkler head. Smoke and heat detectors will be monitored by the fire alarm system.

Provide floor numbers within the hoistway in compliance with ASME 17.1 Code.

All cars shall have ceiling emergency exits sized and located per ASME A17.1

Remove daily trash from hoistways, pits, and machine rooms including all packing material and debris resulting from this work. Leave all elevator spaces broom clean.

Elevator performance criteria shall meet or exceed ASME A17.1.

Electrical wiring shall comply with the ASME A17.1 and National Electrical Codes and all applicable local codes. Wiring shall be included for all devices installed.

Suitable means shall be provided for lubrication with oil or grease for all bearing surfaces in connection with the elevator installation. Grease gun fittings, if used, shall be suitable for high pressure guns. Grease cups, if used, shall be automatic compression type.

Elevator required signage shall be furnished and installed by elevator contractor. All signage to be metal and engraved.

**TTUS FP&C Design & Building Standards**  
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Fixtures shall be metal and vandal resistant. All fixtures shall be approved by submittals. All switches and pushbuttons shall be vandal resistant. All pushbutton lamps shall be Raider Red. All signage shall be engraved metal, no plastic will be permitted. All fixtures shall be manufactured by MAD, INNOVATION, or PTL or others, but equal in all respects, with no exceptions. Texas Tech's Design Team and TTU's Operations Physical Plant Elevator Supervisor will make that determination.

Cab lighting shall be LED down lighting, automatic off/on.

Final Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required by the authority having jurisdiction (Texas Department of Licensing and Regulation), the Project Design Team, and by governing regulations and agencies.

Advise Owner, Project Manager, QEI, and Authorities Having Jurisdiction at least 7 days in advance of dates and times tests are to be performed on elevators.

Conduct on-site Owner's personnel training in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of operational failure and other building emergencies. Train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.

Make a final check of each elevator operation with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.