

PART III – CSU FACILITIES PLANNING, DESIGN AND CONSTRUCTION STANDARDS

DIVISION 14 – CONVEYING EQUIPMENT

Please also refer to “Part IV – REGULATORY REQUIREMENTS” for additional requirements.

Housing and Dining Facilities (HDS) has adopted amendments for all HDS facilities. Confirm applicable standards with Project Representative on a per Project basis. Refer to HDS amendments here – <https://housing.colostate.edu/about/construction/>.

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14 20 00 – ELEVATORS

A. Control Systems:

1. Controller shall be microprocessor based and housed in an enclosed cabinet with hinged access doors.
 - a. It shall include enhanced diagnostic capability to monitor, store and recall elevator malfunctions.
 - b. It shall be field programmable having operation features such as long and short door hold open times, motor-generator shutdown timer, etc.
2. The Manufacturer of the Elevator Control System shall make available to local service companies or to the University for use by service companies of their choice, remote diagnostic service tools necessary for programming, troubleshooting and servicing.
3. Manufactures of Elevator Control Systems that will not provide diagnostic tools as described above shall not be permitted to bid those types of Systems.
 - a. Instead, they shall be required to provide Elevator Control Systems which incorporate an on-board diagnostic station which requires no extra equipment for programming, servicing and troubleshooting such as made by Motion Control Engineering Model HMC-1000 or VVMC-1000 or equal.
4. For both types of Systems include the following features and options:
 - a. Secured access to computer diagnostic use
 - b. Modem communication link with controller
 - c. UL and CSA labels
 - d. Motor limit timer
 - e. Valve limit timer
 - f. Solid state with reduced voltage starting

B. Door Operators:

1. New and retrofit operators shall include the following features and options:
 - a. Ball bearing
 - b. Belt driven
 - c. Solid state controller
 - d. Control and adjustment of operator from car top
 - e. Adjustable closing torque to meet code requirements, slow, and nudging closing action

C. Operation and Maintenance Manuals:

1. Provide one hardcopy set of O&M Manuals, and one electronic version on memory drive or stick.
 - a. Electronic version shall be in one file in logical order with a table of contents, and be fully searchable.
2. Include operating features and diagnostic information for interpretation of data.

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3. Include “as installed” straight–line wiring diagrams showing electrical connections of all new and existing equipment.
 - a. One set shall be reproducible mylars or equivalent.
 - b. Drawings shall name, symbol and locate each relay, switch, contact and other apparatus.
4. A copy of the wiring diagram and As–Built Drawings are to be placed in the elevator mechanical room.
5. Include complete parts catalogs with identifying numbers and ordering instructions.

D. Service Keys:

1. Contractor shall provide ten keys to Project Representative.

E. Design and Construction:

1. Elevators in buildings of three stories or fewer shall be hydraulic and not traction.
 - a. An acceptable alternative for elevators with no more than two stops is a telescoping style jack.
2. Belt style traction elevators shall be equipped with a strain monitoring device on each belt.
3. Traction elevator drives must reliably function at the rated capacity plus at least 25%.
4. Machine Room–Less (MRL) configurations are discouraged.
 - a. MRL Systems shall be accepted on a case–by–case basis if the Manufacturer and Contractor can demonstrate in writing that repairs and annual cost of maintenance are comparable to a conventional hydraulic or traction elevator.
5. All door edges must be electric eye or microlight style; no mechanical bumpers are allowed.
6. The design and construction of the elevator must comply with the American National Standard Institute/American Society of Mechanical Engineers (ANSI/ADME) A17.1 “Safety Code for Elevators”.
7. Handrails should be stainless steel not aluminum or wood.
8. Light fixtures shall have impact resistant lenses.
9. Cab lights shall be LED.
10. Provide in the first floor lobby a power outlet nearby for cleaning equipment to maintain the elevator cab.
11. The Fire Alarm System shall provide two sets of dry contacts for elevator recall purposes.
 - a. In the event of a fire, when applicable by code, the elevator shall be set up with both primary and alternate recall locations by the Elevator Contractor.
12. The Elevator Contractor shall provide a local car alarm signal and voice communication phone with automatic dialing device programmed to contact the Facilities Management (FM) Dispatch Elevator hotline, Housing and Dining Services dispatch line, or Colorado State University (CSU) Police Department.
 - a. Coordinate with the Project Representative for the phone number(s) of the appropriate destination.

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- b. Each elevator phone shall provide a caller ID that shows the building name or address and the elevator number.
- c. The outgoing phone call shall connect directly to the receiving phone without any automatic recording.
- d. Coordinate with Project Representative to determine whether building is equipped with Voice Over Internet Protocol (VOIP).

13. Elevator pits shall be constructed to keep groundwater out of the pit.

F. ADA Standards/Other Uses:

- 1. Elevators shall comply with National Electrical Illumination Institute (NEII) “Suggested Minimum Passenger Elevator Requirements for the Handicapped” which shall include door time adjustment and Braille pads.
- 2. Hall call and car operating panel buttons shall be a flat-faced, protruding stainless steel button style with a square shoulder.
 - a. All buttons shall have square shoulders, be 3/4” (19.1 mm) minimum in the smallest dimension and shall be raised 1/8” (3.2 mm) plus or minus 1/32” (0.8 mm) above the surrounding surface.
 - b. The buttons shall be activated by a mechanical motion that is detectable.
 - c. Buttons that are compliant with California Title 24 Section 11B-407.2.1.2 are acceptable.
- 3. At least one elevator shall be for moving freight or sized for combination freight/passenger.

G. Special Mechanical Traits:

- 1. An override of the alarm to accommodate cleaning with “door hold key” switch or “independent service” switch.
- 2. Elevator Control System shall be simple and practical as possible for the specific application.
- 3. Successful bidder must supply all proprietary diagnostic tools to the purchaser, to be held for use by the Project Representative to be available to successful maintenance contract bidders; or installed without proprietary equipment.
- 4. Proprietary items may be handled through a lease agreement.
- 5. All units shall be equipped with the following: fire recall, telephone box and communication wiring within traveling cable, micro light safety edge on passenger doors, roller guides or door hangers designed for strength to withstand heavy use and impact from items such as carts and equipment.
- 6. Every elevator should have vandal-resistant button panels.
- 7. Provide elevator wall pads for Project Representative’s future use.
 - a. Pads shall be sized and have fasteners specifically for the finished elevator car installed.
- 8. Provide battery powered lowering kit for emergency egress during a building power outage.
 - a. Buildings with Fire Sprinkler Systems shall also require a shunt trip device.
- 9. Apartments and residence hall elevator cabs shall have durable and vandal-proof wall panels, floor and ceiling.
 - a. Submittals are required for Project Representative review and approval.

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H. Control Valves and Installation Requirements:

1. Hydraulic oil in reservoir shall be drained, filtered and replaced in reservoir. If the oil is determined to be burned, it shall be replaced.
2. New in-line shut-off valve shall be installed between reservoir and new control valve whenever control valve is replaced.
3. Control valve shall be capable of controlling elevator to a stopping/starting and leveling accuracy of 1/8".
4. Pressure relief setting shall be 125% of working pressure.
5. The Hydraulic Line System including plunger and cylinder shall be pressure tested following adjustment of pressure relief valve.
6. Control valves must be equal to Maxton Type UC1A or EECO Type UV7.

I. Maintenance and Warranty:

1. Warranty periods shall be as follows:
 - a. Thyssen Krupp:
 - i. One year
 - b. Kone:
 - i. Two years
 - c. Schindler:
 - i. Four years
 - d. Other:
 - i. Two years

14 40 00 – LIFTS

A. Wheelchair Lifts:

1. The use of a wheel chair lift at certain locations shall only be acceptable if no other means of access are available.
2. Approval of the System is required by FM Planning, Design, Construction and Engineering through the Project Representative.
3. Each wheelchair lift shall be furnished with an emergency phone.

END OF DIVISION