

SECTION 14 24 13  
HYDRAULIC FREIGHT ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Hydraulic freight elevators.

1.2 PRICE AND PAYMENT PROCEDURES

- A. This specification section is to bid exactly as written. No substitutions, no changes in operation, no changes to configuration, and no changes to warranty or maintenance terms will be considered.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to the work.

1.4 ACTION SUBMITTALS

- A. Product Data: Technical data for freight elevators including capacities, sizes, performances, operations, safety features, finishes, and similar information.
  - 1. Indicate whether elevator emergency power switch consist of normally open (NO) or normally closed (NC) contact.
- B. Shop Drawings: Submit plans, elevations, sections, and large scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
  - 1. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: Submit samples for finishes involving color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit data for Installer.
- B. Seismic Qualification Certificates: Submit manufacturer's certifications for elevator equipment, accessories, and components.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Manufacturer Certificates: Certifications signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are sufficient for elevator system being provided.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit data for elevators to include in emergency, operation, and maintenance manuals.
1. Submit manufacturer's/installer's operation and maintenance manual, according to ASME A17.1 including diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
  2. Submit detailed loading instructions and diagram of elevator platform indicating how loads are to be distributed in order to allow proper functioning of elevator.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- C. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a two year maintenance agreement, starting on date initial maintenance and warranty service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
- D. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner with terms, conditions, and obligations commencing on date initial maintenance service is concluded.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer having minimum 5 years documented experience.
- B. Source Limitations: Obtain freight elevators from single manufacturer.
1. Major elevator components, including pump and tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.
  2. Elevator components sourced from other than elevator manufacturer require the same warranty and maintenance terms as provided by elevator manufacturer and must be serviced by same service contract provider.

## 1.8 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of work specified that relates to hydraulic freight elevators, including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

## 1.10 WARRANTY

- A. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace elevator work that fails in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
  - 2. Warranty Period: Two year(s) from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.
- B. Accessibility Requirements: Comply with applicable requirements of:
  - 1. Section 407 in the United States Access Board's ADA-ABA Accessibility Guidelines.
  - 2. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.
- C. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator seismic requirements in ASME A17.1/CSA B44.
  - 1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
  - 2. Project Seismic Design Category: As indicated on the Drawings.

3. Elevator Component Importance Factor: 1.5 unless otherwise noted.
4. Design earthquake spectral response acceleration short period (Sds) for Project is as indicated on the Drawings.

## 2.2 FREIGHT ELEVATORS

- A. Basis of Design: Provide Twin Three Stage Jack Holeless, [Roped] Hydraulic Unit by Minnesota Elevator (MEI) . Subject to compliance with requirements, products by one of the following may also be acceptable:
  1. KONE Inc.
  2. Otis Elevator Co.
  3. Schindler Elevator Corp.
  4. ThyssenKrupp Elevator.
  5. Substitutions: All requests for substitution shall comply with Section 01 25 00 Substitution Procedures
    - a. Where holeless units are intended, no substitutions for in-ground piston units shall be considered.
- B. Source Limitations: Obtain freight elevators from single manufacturer.
  1. Major elevator components, including pump-and-tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.
  2. Elevator components sourced from other than elevator manufacturer require the same warranty and maintenance terms as provided by elevator manufacturer and must be serviced by same service contract provider.
- C. Elevator System: Hydraulic freight elevator systems fabricated from standard components, included in standard elevator systems, and as necessary for complete system.
- D. Elevator Description:
  1. Elevator Number(s): as indicated on the Drawings.
  2. Type: Holeless, beside the car, roped hydraulic, telescoping dual cylinder.
  3. Rated Load: 15,000 lb (6804 kg) .
  4. Freight Loading Class: Class C1.
  5. Rated Speed (Up): 150 fpm.
  6. Operational Speed (Down): Same as rated speed (up).
  7. Operation System: Single automatic.
  8. Auxiliary Operations:
    - a. Battery powered lowering.
    - b. Standby power operation.
    - c. Load weighing device.
    - d. Automatic operation of lights and ventilation fans.
  9. Security Features: Card reader and Keyswitch operation.

10. Auxiliary Car Control Station: Provide additional car control station mounted on side of car at height to facilitate operation by forklift truck operator without leaving truck.
11. Car Enclosures:
  - a. Platform Width: As indicated on the Drawings.
  - b. Platform Depth: As indicated on the Drawings.
  - c. Ceiling Height: As indicated on the Drawings.
  - d. Walls and Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
  - e. Handrails: 1/2 by 4 inches (13 by 100 mm) rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
  - f. Wall Bumpers: 1/2 by 4 inches (13 by 100 mm) rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
  - g. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
  - h. Floor: diamond plate steel with slip resistant coating finish, color as selected by Architect.
  - i. Car Gate Type: Vertical biparting.
  - j. Car Gate Operation: Power operated.
  - k. Car Gate Material: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
  - l. Car Sill: Steel angle.
  - m. Lighting: Four 48 inch, recessed, two tube LED light fixture(s) with integral white deflectors and impact resistant UV stabilized acrylic diffusers not less than 0.125 inch thick.
  - n. Light Fixture Efficiency: Not less than 35 lumens/W.
  - o. Ventilation Fan Efficiency: Not less than 3.0 cfm/W.
12. Hoistway Entrances:
  - a. Width: As indicated on the Drawings.
  - b. Height: As indicated on the Drawings.
  - c. Door Type: Vertical biparting .
  - d. Fire Protection Rating: 1-1/2 hours unless otherwise noted on the Life Safety Drawings.
  - e. Door Operation: Power operated with door reopening device.
  - f. Door Material: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
  - g. Door Frame Material: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
13. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
14. Auxiliary Hall Stations: Provide additional pendant mounted, hall push button stations where indicated mounted at height to facilitate operation by forklift truck operator without leaving truck.

## 2.3 SYSTEMS AND COMPONENTS

- A. Pump Units: Positive displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations.
  1. Pump shall be submersible type with submersible squirrel cage induction motor and suspended inside oil tank from vibration isolation mounts or tank top mounted type with fan cooled, squirrel cage induction motor and mounted on oil tank with vibration isolation mounts and enclosed in prime painted steel enclosure lined with 1 inch (25 mm) thick, glass fiber insulation board.

2. Motor shall have solid state starting.
  - B. Hydraulic Silencers: System having hydraulic silencer containing pulsation absorbing material in blowout-proof housing at pump unit.
  - C. Piping: Size, type, and weight of piping recommended by elevator manufacturer, with flexible connectors to minimize sound and vibration transmissions from power unit.
    1. Cylinder units shall be connected with dielectric couplings.
    2. Casing for Underground Piping: Schedule 40 PVC pipe complying with ASTM D1785, joined with PVC fittings complying with ASTM D2466 and solvent cement complying with ASTM D2564.
  - D. Hydraulic Fluid: Nontoxic, biodegradable, fire resistant fluid made from vegetable oil with antioxidant, anticorrosive, antifoaming, and metal passivating additives and approved by elevator manufacturer for use with elevator equipment.
    1. Product: Subject to compliance with requirements, provide Hydro Safe by Hydro Safe Oil Division, Inc.
  - E. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified elsewhere.
  - F. Corrosion Protective Filler: A nontoxic, petroleum based gel formulated for filling the space between hydraulic cylinder and protective casing. Filler shall be electrically nonconductive, displace or absorb water, and gel or solidify at temperatures below 60 degrees F (16 degrees C).
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Hydro Safe Oil Division, Inc.
      - b. Union-Gard.
  - G. Car Frame and Platform: Welded steel units.
    1. Provide special heavy duty units for power truck loading, designed to withstand impacts and wheel loadings indicated.
    2. Permanently indicate manufacturer's loading diagram on finished platform floor.
  - H. Guides: Polymer coated, nonlubricated sliding guides. Provide guides at top and bottom of car and counterweight frames.
- 2.4 OPERATION SYSTEMS
- A. Provide microprocessor operation system necessary to provide type of operation indicated.
  - B. Battery Powered Lowering: When power fails, car is lowered to the lowest floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
    - 1.

C. Load-Weighing Devices:

1. When car load exceeds 80 percent of rated capacity, a signal light is lit in the car-control station.
2. When car load meets 100 percent of rated capacity, a buzzer will sound and car will no longer respond to car or hall calls until load is reduced.

D. Security Features: Security features shall not affect emergency firefighters' service.

1. Card Reader Operation: System uses card readers at car control stations to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. Allow space for card reader in car.
  - a. Security access system equipment shall be coordinated to meet the Owner's needs.
2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at car control stations and hall push button stations. Key is removable only in deactivated position.

## 2.5 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.

## 2.6 CAR ENCLOSURES

- A. Provide car enclosures as indicated, including ventilation, lighting, finishes, access doors, thresholds, trim, and accessories. Fabricate with recesses and cutouts for signal equipment.
  1. Provide power door operators with linkages for hoistway door operation.
  2. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
- B. Materials and Fabrication: Provide flush panel, welded construction made from metal sheet, of metal indicated, not less than 0.067 inch (1.7 mm) and reinforced at 16 inch (406 mm) maximum spacing.
  1. Provide perforated panels for ceiling and for walls above 72 inches (1829 mm) from car floor unless required to be solid by ASME A17.1/CSA B44.

## 2.7 HOISTWAY ENTRANCES

- A. Unless otherwise indicated, provide hoistway entrance doors of type indicated, with truckable sill bars and resilient safety meeting rail gaskets.
  1. Equip for power operation by coordinated linkage with power operated car door.

2. Where gypsum board wall construction is indicated, provide fire resistance rated, hollow metal, door and frame hoistway entrances. Provide self supporting frames with reinforced head sections.
- B. Fire Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
- C. Materials and Fabrication: Provide manufacturer standard, but not less than:
  1. Metal Door Panels: Constructed of metal sheets, flush on room side, welded and reinforced in steel framing with vertical reinforcing spaced not more than 24 inches (610 mm) o.c. Fabricate panel faces from metal sheet, of metal indicated, not less than 0.097 inch (2.5 mm) thick.

## 2.8 SIGNAL EQUIPMENT

- A. Provide hall call and car call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with LEDs or of acrylic or other permanent, nonyellowing translucent plastic.
- B. Car Control Stations: Provide car control station. Mount adjacent to car door unless otherwise indicated.
  1. Mark buttons and switches for function. Use both tactile symbols and Braille.
  2. Mount controls at heights complying with the United States Access Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.
- C. Emergency Communication System: Two way voice communication system, with visible signal that dials preprogrammed number of monitoring station and does not require handset use. System is contained in flush mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Firefighters' Two Way Telephone Communication Service: Provide hands free push to talk phone in each car and required conductors in traveling cable for firefighters' two way telephone communication service. Refer to Division 28 for additional information and requirements.
- E. Car Position Indicator: Provide illuminated digital type car position indicator, located above car door or above car control station.
- F. Hall Push Button Stations: Provide hall push-button stations at each landing as indicated.
  1. Provide single button stations with position indicator.
  1. Provide telephone jack in each unit for firefighters' two way telephone communication service. Refer to Division 28 for additional information and requirements.

## 2.9 FINISH MATERIALS

- A. Cold Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel, Type B, exposed, matte finish.
- B. Hot Rolled Steel Sheet: ASTM A1011/A1011M, commercial steel, Type B, pickled.
- C. Metallic Coated Steel Sheet: ASTM A653/A653M, commercial steel, with G60 (Z180) zinc coating (galvanized) or A60 (ZF180) zinc-iron-alloy coating (galvannealed).
- D. Stainless Steel Sheet: ASTM A240/A240M, Type 304.
- E. Stainless Steel Bars: ASTM A276, Type 304.
- F. Stainless Steel Tubing: ASTM A554, Grade MT 304.
- G. Aluminum Alloy Rolled Tread Plate: ASTM B 632/B632M, Pattern 1, Alloy 6061-T6.
- H. Checker Plate Wainscott: ASTM B 632/B632M, Pattern 1, Alloy 6061-T6.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine elevator area for compliance with requirements for installation tolerances and other conditions affecting performance of the work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report listing conditions detrimental to performance of the work.
- C. Proceed with installation after correcting unsatisfactory conditions.

### 3.2 INSTALLATION

- A. Elevator systems shall be installed to comply with all Code requirements and to withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator seismic requirements in ASME A17.1/CSA B44. Any variations and requirements by the local authority shall be remedied at no additional cost to the Project or Owner.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS workmanship and welding operator qualifications standards.
- C. Sound Isolation: Mount rotating and vibrating equipment on vibration isolating mounts to minimize vibration transmission to structure and structure borne noise due to elevator system.

- D. Install piping above the floor, where possible. Install underground piping in casing.
  - 1. Excavate for piping and backfill encased piping according to applicable requirements in Division 31.
- E. Lubricate operating parts of systems as recommended by manufacturers.
- F. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Operating Test: Load elevator to rated capacity and according to loading diagram provided by manufacturer. Operate continuously for 60 minutes over full travel distance, stopping at each level and proceeding immediately to the next.
  - 1. Record temperature rise of elevator machine every 10 minutes during 60-minute test period.
  - 2. Record and thoroughly document any failures to perform as required.
- C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

### 3.4 PROTECTION

- A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with requirements for elevator used for construction purposes:
  - 1. Provide protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
  - 2. Do not load elevators beyond their rated weight capacity.
  - 3. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation. Provide the same parts and supplies as those used in the manufacture and installation of original equipment.
  - 4. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

### 3.5 DEMONSTRATION

- A. Engage a factory authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator(s).
- B. Check operation of each elevator with Owner's personnel present and before date of Substantial Completion and not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

### 3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 24 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 1. Perform maintenance during normal working hours.
  - 2. Include 24 hour per day, 7 day per week emergency callback service with response time of two hours or less.

END OF SECTION

This page intentionally left blank.