

Specification for Borehole Freight Elevators

Part 1 General

1.01 Description

A. This specification is intended to cover the complete furnishing and installing of one borehole freight elevator as manufactured by Minnesota Elevator, Incorporated or approved equal. All work shall be performed in a professional manner and is to include all work and material in accordance with the drawings and as specified herein. In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to complete the installation.

1.02 Work not included

A. To complete this installation, the following items must be performed or furnished by other than the elevator contractor in accordance with governing codes:

1. A properly framed and enclosed legal hoistway, including venting as required by the governing code or authority. Temperature in hoistway to be maintained between 40° F. and 90° F.
2. Suitable machine room with legal access and ventilation, with concrete floor. Temperature in machine room to be maintained between 55° F. and 90° F.
3. Adequate rail bracket supports, bracket spacing as required by governing code. Separator beams and machine beams where required.
4. Dry pit reinforced to sustain normal vertical forces from rails where required and impact loads from buffer.
5. Any cutting, including cutouts to accommodate hall signal fixtures, patching and painting of walls, floors or partition is together with finish painting of doors and frames.
6. Mechanical requirements as follows:
 - a. Machine room venting.
7. Electrical requirements as follows:
 - a. All electric power for lights, tools, hoists, etc. during erection as well as electric current for starting, testing and adjusting the elevator.
 - b. A fused disconnect switch for each elevator per the National Electrical Code with feeder or branch wiring to controller. Size by elevator contractor.

- c. A 120 volt, AC, 15 amp, single phase power supply with fused SPST disconnect switch for each elevator, with feeder wiring to each controller for car lights.
- d. Suitable light and convenience outlets in machine room with light switches located within 18 inches of lock jamb side of machine room door.
- e. Convenience outlet and light fixture in pit with switch located adjacent to the access door.

8. Guarding and protecting the hoistway during construction. The protection of the hoistway shall include solid panels surrounding each hoistway opening at each floor, a minimum of 48 inches high. Hoistway guards to be erected, maintained and removed by others.

9. Provide and install freight door frames plumb to each other.

1.03 Quality

A. All work shall be performed in accordance with (the edition adopted by the governing authority as of the date bids are taken) of the American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks (ASME A17.1), the National Electrical Code and/or such State and local codes as may be applicable.

1.04 Submittals

A. Shop Drawings: The elevator contractor shall prepare drawings showing the general arrangement of the elevator equipment and cab. These drawings shall be approved and the hoistway size guaranteed before proceeding with fabrication and installation of the elevator.

1.05 Permits taxes and licenses

A. All applicable sales and use taxes, permit fees and licenses, of the date bids are taken, shall be paid for by the elevator contractor.

1.06 Warranty

A. Minnesota Elevator, Inc. products are guaranteed for 24 months from the date of shipment from our plant against any manufacturing defects in material and workmanship, which may develop in service for which they were intended or recommended.

1.07 Maintenance

A. A quality maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment shall be provided by the elevator contractor for a period of three (3) months after the elevator has been turned over for the customer's use. All work shall be performed by competent employees during regular working hours

of regular working days and shall include emergency 24 hour callback service. This callback service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

1.08 Job conditions

A. Temporary Use of Elevator: Should any elevator be required for use before final completion, others shall provide without expense to elevator contractor, if required, temporary car enclosures, requisite guards or other protection for elevator hoistway openings, main line switch with wiring, necessary power, signaling devices, lights in car and elevator operators together with any other special labor or equipment needed to permit this temporary usage. The elevator contractor shall be reimbursed for any labor and materials which is not part of the permanent elevator installation and which is required to provide temporary elevator service. In addition, the elevator contractor's temporary acceptance form shall be executed before any elevator is placed in temporary service, and the cost of power and operation, maintenance or the equipment and rehabilitation of equipment shall be paid for by others.

Part 2 Products

2.01 Elevator Equipment

A. Description of equipment:

1. Capacity: _____ lbs.
2. Speed: _____ FPM
3. Operation: Simplex Selective/Collective
4. Car Platform Size: ____'-____" wide by ____'-____" deep
5. Clear Hoistway Size: ____'-____" wide by ____'-____" deep
6. Pit depth _____
7. Overhead _____
8. Travel (verify): ____'-____"
9. Power Supply: _____ VAC (verify), 3 phase, 60 cycle
10. Stops: _____

11. Openings front _____

12. Openings rear _____

B. Rails

Steel elevator guide rails shall be furnished to guide the car, erected plumb and securely fastened to the building structure.

C. Wiring

All wiring and electrical connections shall comply with the governing codes. Insulated wiring shall have flame retardant and moisture-proof outer covering, and shall be run in conduit tubing or electrical wireways. Traveling cables shall be flexible and suspended to relieve strain on individual conductors.

D. Leveling device

The elevator shall be provided with an automatic leveling device which will bring the car to a stop within 1/4" of the landing level regardless of load or direction of travel. Landing level will be maintained within the leveling zone irrespective of the hoistway doors being open or closed.

E. Pit switch

An emergency stop switch shall be located in the pit.

F. Controller: Microprocessor based, non-proprietary, VMI controller.

G. Platform

The car platform shall be of steel construction with a fire rated plywood subflooring and painted steel diamond plate floor. Steel, code compliant, toe guard. Diagonal braces from toe guard bottom to platform stringers.

H. Car frame

A suitable car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosure. Buffers as specified by code to stop car. Guides shall be mounted on top and bottom of the car frame to engage the guide rails.

I. Cylinder

The cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure per current ASME 17.1 Code. The top of the cylinder shall be equipped with a cylinder head with drip ring and self-adjusting packing. The plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. The plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. The plunger and cylinder shall be installed plumb and must operate freely with minimum friction.

J. Oil line

Schedule 40 ASTM A-53 Grade B pipe shall be installed between the pumping unit and the cylinder.

K. Oil line fittings

Fittings shall be of the grooved type. Shut-off valves shall be provided in the machine room and in the elevator pit for maintenance and adjusting purposes.

L. Oil line support stands

Oil line shall be supported with an adequate number of support stands. Stands shall be anchored to the floor or wall and adjustable in height. Isolation clamps shall secure the oil line to the stand around the full 360 degree circumference.

M. Pumping unit tank

The storage tank shall be constructed of steel and shall be provided with a removable cover containing a removable oil dip stick. The pump and submersible motor shall be mounted on reinforced isolation. The control valve shall be mounted in the discharge line above the oil level and easily accessible from the top of the tank. An air-bladder silencer shall be provided at the control valve discharge.

N. Pumping unit motor

The motor shall be of the submersible alternating current, squirrel cage induction type and shall be of a design adapted to electro-hydraulic requirements.

O. Pumping unit pump

The pump shall be a positive displacement screw type to give smooth operation and shall be designed and manufactured for elevator service.

P. Pumping unit control valve

The control valve shall be manifold with up, down and check valve sections. A control section including solenoid valves will direct the main valve and control up and down starting, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. Down speed and up and down leveling shall be controlled at the main valve sections. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. The manual lowering feature will permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

Q. Oil cooler (optional for low use elevators)

1. Oil cooler with heat rejection of 18,000 BTU/hr, based on ambient temperature 40 deg F cooler than oil out. Cooler may be mounted adjacent on pumping unit storage tank or remote up to 110 ft. horizontally and 55 ft. vertically.

2. To include:

- a. Single fan radiator
- b. Adjustable thermostat control
- c. Isolated radiator mounts

- d. 10 micron easily changeable filter
- e. Restriction sight glass with bypass in case of plugged filter
- f. Single plug for 115 VAC 20 amp separate circuit
- g. Fittings, hardware, and instructions

2.02 Car and hall fixture

A. Car operating panel:

1. Applied car operating panel shall be furnished inside the cab. Panel will contain a bank of mechanical illuminated buttons marked to correspond to the landings served, an emergency stop button, door stop, door open and door close buttons.
2. The emergency call button shall be connected to a bell that serves as an emergency signal. Light switch shall also be located in the car-operating panel.
3. Car operating panel shall contain all necessary operating components, buttons, and switches as required by ANSI A.17.

B. Phase II fire operating instructions are to be displayed according to code on the car operating panel.

C. Elevator number and "No Smoking" are to be on an inlaid plate on the car operating panel, capacity in pounds will be engraved.

D. Top and bottom access switches included in hall stations.

E. Hall stations:

1. At each landing a single call button shall be provided.
2. Door open, door close, and an in-use light shall be provided in each hall station.
3. When a call is registered by momentary pressure on a landing button, that button shall become illuminated and remain illuminated until the call is answered.
4. The designated fire return floor shall include a fireman's emergency key switch that meets state and local code requirements.

F. Phase I firefighters' operating instructions are to be engraved or silk screened on the designated fire return hall station faceplate.

2.03 Car Enclosure

A. Walls and canopy shall be 14 gauge steel panels. Wall panels shall be 24" width maximum.

B. Canopy panels shall be 24" width maximum.

C. Wall panel seams shall line up with canopy panel seams.

D. Gate post shall be adjustable to accommodate variation in wall panels.

- E. Wall panels shall be interchangeable.
- F. Canopy panels shall be interchangeable.
- G. Lights to be (2) tube by 4' long fluorescent with top guards.
- H. Finish to be powder coat.
- I. Infrared curtain unit (ICU) door protection.

Part 3 Execution

3.01 Inspection

- A. Prior to beginning the installation of elevator equipment, examine the following and verify that no irregularities are existing that would affect quality or execution of work as specified.
- B. Hoistway condition:
 - 1. Hoistway size and plumbness
 - 2. Sill pockets
 - 3. Sill supports
- C. Do not proceed with installation until previous work conforms to project requirements.

3.02 Installation

- A. Install the elevator in accordance with accepted manufacturer's directions and ANSI A17.1.
- B. Install machine room equipment with clearances, hoists or other means for each maintenance.
- C. Install items so that they may be removed by portable hoists or other means for maintenance.

3.03 Field quality control

- A. Provide all personnel, equipment and instruments required for inspection and testing.
- B. Have acceptance inspection as required by local authority performed by enforcing agency.

3.04 Adjust and clean

A. Adjustments

Adjust brackets, controllers, leveling switches, generators, limit switches, stopping switches and safety governors to operate to within accepted design tolerances.

Adjust car leveling devices so car stops within 1/4" of finished floor.

Lubricate all equipment in accordance with accepted manufacturer's instructions.

B. Clean Up

Removal from hoistway surfaces all loose materials and filings resulting from this work.

Clean machine room floor of dirt, oil and grease.

Remove crating and packing materials from premises.

End of section