

SPECIFICATION FOR MINNESOTA ELEVATOR, INC.
4500# -6000# TWIN JACK 1:2 ROPED HYDRAULIC PASSENGER ELEVATOR

PART 1 - GENERAL

1.01 DESCRIPTION

This Specification is intended to cover the complete furnishing and installing of one (1) twin jack 1:2 roped oil hydraulic passenger elevator as manufactured by Minnesota Elevator, Incorporated or approved equal.

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 and governor access as required by the governing code or authority.
2. Suitable machine room with legal access and ventilation, with a 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 where required.
4. Dry pit reinforced to sustain normal vertical forces from cylinder and rails, and impact loads from buffer engagement and safety setting forces through rails.
5. Adequate support for sill angles across full width of hoistway at each landing. Vertical surfaces of entrance sill supports to be plumb, one above the other, and square with the hoistway. Finished floor and grout, if required, between door frames and sill line.
6. Hoistway walls are to be designed and constructed in accordance with the required fire rating including where penetrated by elevator fixture boxes and to include adequate fastening to hoistway entrance assemblies. Front entrance walls are not to be constructed until after door frames and sills are in place.
7. Any cutting, including cutouts to accommodate hall signal fixtures, patching and painting of walls, floors or partition is together with finish painting of entrance doors and frames.
8. Mechanical requirement as follows:
 - a. Machine room venting.
9. Electrical requirement 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 to suit elevator contractor.
 - c. A 120 volt, AC, 20 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. A convenience outlet and light fixture in the pit with the switch located adjacent to the access door.
10. Telephone instrument or means within the car for communicating or signaling to an accessible point outside the hoistway or central exchange system or approved emergency service, unless stated elsewhere in the Specifications.
11. Guarding and protecting the hoistway during construction:

- a. The protection of the hoistway will include solid panels surrounding each hoistway opening at each floor, a minimum of 48 inches high.
- b. Hoistway guards to be erected, maintained and removed by others.

1.03 QUALITY ASSURANCE

- A. All work will be performed in accordance with the latest revised edition (as of the date bids are taken) of the American Society of Mechanical Engineers Safety Code for Elevators and Escalators (ASME A17), the National Electrical Code and/or such State and local codes as may be applicable.

1.04 SUBMITTALS

- A. Shop Drawings: The elevator contractor will prepare drawings showing the general arrangement of the elevator equipment and cab. These drawings will 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, will be paid for by the elevator contractor.

1.06 GUARANTEE

- A. The elevator contractor will guarantee the materials and workmanship of the apparatus furnished by him under these specifications and he will make good any defects not due to ordinary wear and tear or improper use or carelessness which may develop within one (1) year from date of completion of each elevator.

1.07 MAINTENANCE

- A. A quality maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment will 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 will be performed by competent employees during regular working hours of regular working days and will include emergency 24 hour callback service. This callback service will 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 will be provided.

1.08 JOB CONDITIONS

- A. Temporary Use of Elevator:
 - 1. Should any elevator be required for use before final completion, others will provide without expense to the elevator contractor, if required, temporary car enclosures, requisite guards or

other protection for elevator hoistway openings, a 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.

2. The elevator contractor will 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 will 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 will be paid for by others.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Description of equipment: One (1) 1:2 Roped Oil Hydraulic Passenger Elevator

1. Controls: Microprocessor based, non-proprietary
2. Capacity: _____lb
3. Speed: _____FPM
4. Operation: Selective Collective
5. Platform Size: _____Wide x _____Deep
6. Travel: _____ Feet _____Inches
7. Power Supply: _____ (Verify), 3 phase, 60 cycles
8. Machine Location: Adjacent to hoistway on lowest level
9. Stops: _____
10. Openings: _____
11. Hoistway Size: _____Wide x _____Deep
12. Hoistway Doors:
 - Size: _____Wide x _____High
 - Type: _____
 - Finish: _____
13. Door Operation: Automatic, D.C. Powered
12. Signals: Illuminated landing buttons
15. Special Features
 - a. ADA telephone located behind perforated speaker pattern in swing car station
 - b. Infrared curtain unit (ICU) door protection
 - c. Emergency cab lighting and alarm
 - d. Braille plates
 - e. Audible signal
 - f. Locate all fixtures for disability usage
 - g. Exhaust fan – 2 speed

B. Hoistway Equipment:

1. Platform
 - Welded steel stringers and headers. Subfloor consisting of one layer of 14 gauge steel and one layer of 15/32" grade CDX plywood. Exposed edges of plywood to be covered

with steel strip or coated with fire-retardant paint. Front and rear of platform to be supported from beneath by transverse structural steel channel weldment.

2. **Toe Guard**
24" high x 16 gauge, galvanized steel, with diagonal braces from toe guard bottom to platform stringers.
3. **Sling**
Bolted assembly consisting of formed or structural steel channel. Brace rods with continuously adjustable length to support all four corners of platform.
4. **Guide Set**
Cast aluminum slipper guides with removable UHMW polyethylene gibs.
5. **Buffer Stands**
Two free-standing spring buffer stands consisting of drilled floor plate, tubular upright, and removable springs with internal stop pipes to control stroke.
6. **Rail**
 - A. **Main Rail**
Solid steel elevator guide rails shall be furnished to guide the car, erected plumb and securely fastened to the building structure.
 - B. **Auxiliary Rail**
Lightweight hollow formed sheet steel elevator guide rails shall be furnished to guide the sheave assembly, erected plumb and securely fastened to the building structure.
7. **Rail Brackets**
 - A. **Main Rail Brackets**
Two steel angles bolted together, one fastened to wall and the other clipped to the rail back. Adjustable for widthwise and depthwise position.
 - B. **Auxiliary Rail Brackets**
U-shaped bracket with guide spacing pre-set. Adjustable for widthwise and depthwise position.
8. **Limit Switch Package**
Cam to be 14 gauge steel, 5 ft. high, ramped at ends. Limit switch package to consist of seven CSA-approved switches and five brackets to mount switches to back of rail. Switches to be pre-wired, and assembled as follows: (1) top slowdown on one bracket; (2) top directional and top final combined on one bracket; (3) bottom slowdown on one bracket; (4) bottom directional and bottom final combined on one bracket; (5) access zone on one bracket.

9. Rope and Sheave Assembly
Sheave shall comply with ASME A17.1-2000, Sections 2.24 and 3.18.1. Rotating sheave to be mounted to fixed shaft through ball or roller bearings. Sheave support base to be attached to top of plunger with single 1-1/4" UNC bolt. Adjustable rope retainers shall be provided over the full 180 degree arc of contact. Sheave to be supported by two rails through cast aluminum slipper guides with removable UHMW polyethylene gibs. Suspension ropes and connections shall comply with ASME A17.1-2000, Section 2.20. Ropes to be pre-stretched 8x19 construction with independent wire rope core. Shackles to be of the wedge rope socket type. A manually reset switch shall remove power from the driving motor and control valve should any rope become slack.
10. Safety
Car safeties shall be of the instantaneous type, and shall comply with ASME A17.1-2000, Sections 2.17 and 3.17.1. Each safety set shall be provided with a manually reset switch to remove power from the driving motor and control valve at the time of application of the safety.
11. Governor
Safeties shall be operated by a speed governor complying with ASME A17.1-2000, Section 2.18. Governor shall be of the self-resetting type. Governor shall be equipped for remote set testing by simultaneous operation of two instantaneous pushbutton switches in the elevator controller.
12. Cylinder Mounting Assembly
Base of cylinder to be elevated above pit floor by a pedestal weldment, including : (1) dead-end hitch plate for pit shackles, and (2) mounting surface for slack rope switch. Pedestal and cylinder to be secured to wall by a steel bracket around the full 360 degree circumference, to fasten to the wall mounting surface with two horizontally spaced bolts, and adjustable for widthwise, depthwise, and vertical adjustment .
13. Cylinder
The cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure per current ASME 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.
14. Oil Line
Schedule 40 ASTM A-53 Grade B pipe shall be installed between the pumping unit and the cylinder.

15. 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.

16. 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.

17. Pit Switch

An emergency stop switch will be located in the pit.

C. Pumping Unit

1. Tank

The storage tank shall be constructed of 12-gauge steel and shall be provided with a removable cover containing a removable oil dip stick. The pump and submersible motor shall be mounted on a special reinforced isolation mount. 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.

2. Motor

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

3. Pump

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

4. 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.

5. Negative Pressure Switch

Negative pressure switch to be pre-installed to valve.

6. Oil Cooler

Oil cooler with heat rejection of 18,000 BTU/hr, based on ambient temperature 40 degF cooler than oil out. May be mounted adjacent on pumping unit storage tank, or remote

up to 110 ft. horizontally and 55 ft. vertically. To include: (1) single fan radiator; (2) 8 GPM 100 psi cast iron pump; (3) 1 HP 115 VAC 1-phase ball bearing motor; (4) adjustable thermostat control; (5) isolated radiator mounts; (6) 10 micron filter; (7) single plug for 115 VAC 20 amp separate circuit; (8) fittings, hardware, and instructions.

Note: Oil cooler is optional for passenger cars with travels less than 25 ft., or for low usage applications such as churches and elementary and secondary schools.

D. Wiring

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

E. Leveling Device

The elevator will be provided with an automatic leveling device which will bring the car to a stop within 3/8" 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.

F. Controller

A non-proprietary microprocessor controller as manufactured by Vertitron Midwest, Inc. will be provided including necessary starting switches of adequate size together with all relays, switches and hardware required to accomplish the operation specified. A three-phase overload device will be provided to protect the motor against overloading.

G. Car Stall Protective Circuit

A protective circuit will be provided which will stop the motor and the pump and return the car to its lowest landing in the event that the car, while traveling up, does not reach its designated landing within a predetermined time interval. This circuit will permit a normal exit from the car but prevent further operation of the elevator until the trouble has been corrected.

H. Emergency Car Lighting

An emergency power unit employing a 6 volt sealed rechargeable battery and totally static circuits will be provided that will illuminate the elevator car and provide current to the alarm bell in the event of normal power failure. The equipment will comply with the requirements of the ASME Code. This unit will be an integral part of the car operating panel.

I. Zoned Hoistway Access Keyswitch

1. A keyswitch will be provided at both landings which will allow limited car operation while car and hoistway doors are opened.

J. Car and Hall Signal Fixtures

1) Swing Car Operating Panel

- a) A swing-type car operating panel shall be furnished. Panel will contain a bank of mechanical illuminated buttons marked to correspond to the landings served, an

emergency stop button, door open and door close buttons. The emergency call button shall be connected to a bell that serves as an emergency signal. Switches for lights and fan shall also be located in the car operating panel.

(1) A flush mounted, full height (floor-to-transom) applied car operating panel/box is acceptable provided the faceplate is flush with the car return panel giving the appearance of a swing return panel.

- b) Phase II fire instructions are to be engraved or silk screened (applied plates are not acceptable) on the car operating panel.
 - c) Elevator number, “No Smoking”, and capacity in pounds are to be engraved or silk screened (applied plates are not acceptable) on the car operating panel.
 - d) Car operating panel shall contain all necessary operating components, buttons, and switches as required by ASME A.17.
- 2) Handicap Markings
- a) Braille plates shall be furnished for car buttons, car controls, and hoistway entrance jambs in compliance with NEII and ADA handicap requirements.
 - b) Car Braille plates are to be flush mounted and permanently attached (“Stick-on” plates are not acceptable).
- 3) Audible Signal (to indicate stopping at a floor)
- a) An audible signal shall sound in the car to tell a passenger that the car is stopping at the floor served by the elevator.
- 4) Hall Buttons
- a) At each terminal landing a single push button shall be provided.
 - b) 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.
 - c) The designated fire return floor shall include a fireman’s emergency key switch that meets state and local requirements.
 - d) Phase I fire instructions are to be engraved or silk screened (applied plates are not acceptable) on the designated fire return hall station faceplate.

K. ADA Telephone

- 1) An ADA approved telephone shall be provided and mounted behind the car operating panel. A pattern of holes for speaker shall be punched into the flush car operating panel faceplate or swing return panel (applied speaker grilles are not acceptable).
- 2) Necessary wires shall be included in the car traveling cable.
- 3) Connections to the building service system shall be furnished by Owner.

L. Passenger Cab Enclosure

- 1. Canopy: 14 gauge steel, enamel painted
- 2. Ventilation: Two-speed exhaust fan in car canopy controlled by key switch in car operating panel
- 3. Lighting: Fluorescent
- 4. Ceiling: Drop ceiling, translucent eggcrate or Lexan diffuser panels in aluminum frame
- 5. Front Return Wall(s): 16 gauge #4 Stainless Steel
- 6. Entrance Columns: 16 gauge #4 Stainless Steel
- 7. Transom: 16 gauge #4 Stainless Steel
- 8. Car Door(s): #4 Stainless Steel
- 9. Car Sill(s): Aluminum
- 10. Side Walls and Rear Wall:
14 gauge #4 stainless steel

or
14 gauge Steel, enamel painted
or
laminated panel
or
removable raised laminated panel with enamel painted reveals

11. Handrail(s): #4 Stainless Steel ½" x 1 ½"
12. Base: Enamel painted - Recessed base on removable panel cabs only
13. Accessories:
 - a. An emergency exit(s) will be provided as required by code.
 - b. Pad & buttons

M. Hoistway Entrances

1. Passenger type hoistway entrances with UL label, hollow metal, horizontal sliding will be provided.
2. Entrance type and clear opening size will be in accordance with data at the beginning of this proposal.
3. Sills, struts, headers, hanger covers, and frames will be erected by vendor and set in proper relation to the car guide rails. Such erection is to be accomplished prior to construction of rough walls which is the purchaser's responsibility. Door panels will be installed by vendor after the wall erection is completed.
4. Entrances will include unit frames, flush design door panels, sight guards, dust covers, and necessary hardware.
5. Fascia, hanger covers, toe guards, dust covers, and structural members will be fabricated and finished in accordance with vendor standards. Entrance sills are to be aluminum.
6. Entrances shall be constructed of #4 stainless steel.

N. Door Operation

1. Doors on the car and at the hoistway entrances will be power operated by means of a direct current operator mounted on top of the car. The motor will have positive control over door movement for smooth operation. Each car door will have a safety shoe to cause instant reopening should contact be made with an obstruction during the closing cycle.
2. Door operation will be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of a time interval. A car door electric contact will prevent starting the elevator away from the landing unless the car door is in the closed position.
3. Door closing will be arranged to start within a time consistent with disability requirements from notification that a car is answering a hall call.
4. Doors will be arranged to remain open for a time period sufficient to meet disability requirements.
5. The time interval for which the elevator doors remain open when a car stops at a landing will be independently adjustable for response to car calls and hall calls.
6. An approved positive interlock will be provided for each hoistway entrance which will prevent operation of the elevator unless all doors for the elevator are closed and will maintain the doors in their closed position while the elevator is away from the landing. Emergency access to the hoistway as required by governing codes will be provided.

O. Infrared Curtain Unit (ICU)

An infrared curtain door protection device with a minimum of 47 beams will be provided in the

elevator car entrance, which when interrupted will cause the closing doors to stop and reopen. A key operated switch for disconnecting the ICU will be provided in the car operating station.

- P. Disability Markings
Special markings will be furnished for car buttons, car controls and hoistway door jambs in compliance with NEII Handicap Requirements.
- Q. Operation – Simplex Selective/Collective
Operation will be automatic by means of the car and landing buttons. Stop calls registered by the momentary actuation of the car or landing buttons will be made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. All stops will be subject to the respective car or landing button being actuated sufficiently in advance of the arrival of the car at that landing to enable the stop to be made. The direction of travel for an idle car will be established by the first car or landing button actuated.

PART 3 - EXECUTION

3.01 INSPECTION

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

3.02 INSTALLATION

- A. General:
1. Install the elevator in accordance with accepted manufacturers= directions and ASME A17.1.
 2. Install machine room equipment with clearances, hoists or other means for maintenance.
 3. 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, required by local authority, performed by enforcing agency.

3.04 ADJUST AND CLEAN

- A. Adjustments:
1. Adjust brackets, controllers, leveling switches, generators, limit switches, stopping switches

and safety governors to operate to within accepted design tolerances.

2. Adjust car leveling devices so the car stops within 3/8" of the finished floor.
3. Lubricate all equipment in accordance with accepted manufacturers= instructions.

B. Clean Up:

1. Removal from hoistway surfaces all loose materials and filings resulting from this work.
2. Clean the machine room floor of dirt, oil and grease
3. Remove crating and packing materials from premises.

End of Section