



**m a n u f a c t u r i n g
c o m p a n y , i n c .**

Roped Hydraulic
Limited Use/Limited Application
(LU/LA)
Elevator Planning Guide

Introduction



This planning guide is intended to provide a general guideline for builders, architects, and owners designing for a limited use/limited application elevator manufactured by Custom Elevator Manufacturing Company. It is recommended that you contact your local authorities governing the installation of public elevators in your area and follow all guidelines for commercial building requirements and any regulations that may take precedence over any recommendations listed or detailed in this guide.

If you should have any questions or would like to locate a dealer in your area, please call our sales department at 1-888-443-2800.

Contents

- **Equipment Overview 1**
- **Work by Others 2**
- **Hoistway Size Requirements 3**
- **Recommended Hoistway Construction Plan 4**
- **Recommended Hoistway Construction Elevation 5**
- **Machine Room Plan 6**
- **Specifications 7**

Equipment Overview

➤ General:

- Travel up to 25'-0" (as per ASME A17.1/ CSA B44-00)
- Up to four (4) stops
- Load capacity: 1400 lbs
- Speed: 30 fpm
- Overhead: 11'-0" minimum (9'-6" minimum with alternative means for existing buildings)
- Pit depth: 3'-6" minimum (14" minimum with alternative means)
- Roped Hydraulic Drive
 - 1:2 roped hydraulic
 - Governor actuated safety
 - Remote machine room can be located up to 40' from the hoistway.
 - 5 HP submersed motor with two-speed valve assembly
- 220 volt single phase power supply

➤ Standard Features:

- Car size: 42" x 60" interior
- 81" interior ceiling height
- No. 4 (brushed) stainless steel hall call and car operating panel
- Brushed Stainless Steel handrail
- Fire rated wood core cab wall panels faced with plastic laminate and black filled reveals to simulate applied panels
- Car entrance including strike column, return panel, and transom are #4 brushed stainless steel finish
- Two speed reinforced hollow metal horizontal sliding car doors with #4 brushed stainless steel finish
- Infrared door edge protection with automatic door reopen system
- Steel canopy with fire rated thermoclear panel suspended ceiling and fluorescent lighting above
- Extruded aluminum car sill
- #4 brushed stainless steel certificate frame
- Two speed horizontal sliding fire rated hoistway door and frame assemblies with prime (paintable) finish and extruded aluminum sills
- Heavy duty DC master door operator
- Unfinished plywood floor
- Sill set for 1/4" finished floor
- Digital floor position indicator with car direction arrows and audible signal
- Car and hall "Acknowledge" lights
- Automatic on/off cab lighting
- Braille tags in car and hall
- Keyed emergency stop and alarm bell
- Emergency cab lighting
- Car light override key switch
- Floor selectable battery lowering
- Homepark feature
- Manual lowering device
- Top of car inspection operation
- Recessed telephone box in cab
- Microprocessor based control system
- Two year limited parts warranty

➤ Optional Features:

- Custom car sizes, additional travel, and additional floor stops available
- Direct acting hydraulic drive in lieu of roped 1:2
- Wide variety of plastic laminate color choices
- Steel with baked enamel finish cab wall panels
- #4 brushed stainless steel cab wall panels
- #4 brushed stainless steel base (kickplates)
- Protection pads and hooks
- Car top emergency exit
- Exhaust fan
- Plastic laminate faced car door(s)
- #4 brushed bronze cab metal finishes
- Fire rated accordion car door(s) available in chalk, light oak, or aluminum finish in lieu of two speed horizontal sliding doors
- Automatic car door operator for accordion car door(s)
- 36" x 80" fire rated swing door entrance(s) with prime (paintable) finish in lieu of two speed horizontal sliding doors
- Digital hall position indicators with direction arrows incorporated into the hall call station
- Car travel lantern with audible signal
- Fire service phase I and II with alternate return floor
- ADA compliant phone
- #4 brushed bronze faceplate/button finishes
- Keyed control switches in car and/or hall
- Remote-set solenoid on governor for testing from the machine room



1:2 ROPED HYDRAULIC

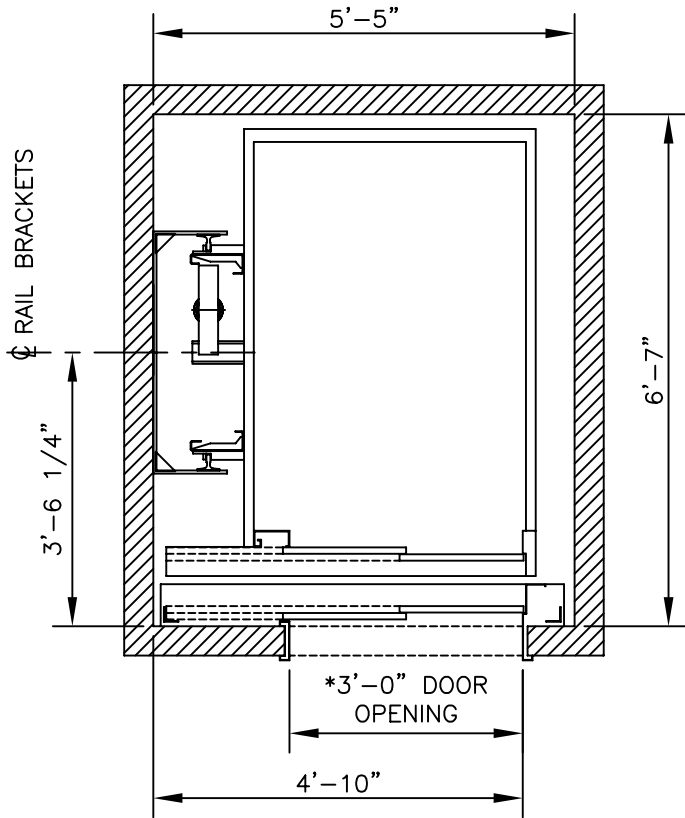
Work by Others

Customer, or customer's contractor, shall be responsible, at the customer's expense, for the following prior to the commencement of work by the elevator contractor.

1. Finished hoistway guaranteed plumb within ½ inch from top to bottom, and conforming to the dimensions indicated on layout drawings provided. All walls and side members must be square and extend from sill to beam above. Inside surface of hoistway must be flush. Interior of hoistway should be finished prior to installation. Hoistway must be constructed in accordance with ASME A17.1/CSA B44-00 and all state and local building code requirements.
2. Adequate supports shall be provided for fastening rail brackets as indicated on the layout drawings. Supports must withstand rail forces indicated.
3. Where wood frame construction is used, double 2 X 12's spaced as indicated on layout drawings, and extending the full height of the hoistway are recommended.
4. For masonry walls, inserts shall be provided by elevator contractor and installed by the general contractor.
5. Total travel distance from finished bottom floor to finished top floor must be held within 1" of that shown on layout drawings.
6. Overhead clearance: (top floor to underside of hoistway ceiling or obstruction) to be maintained per the layout drawings. If a minimum of 11'-0" cannot be achieved, contact factory for alternate arrangement.
7. A poured pit conforming to the dimensions indicated on the layout drawings must be provided. The pit must be designed for the impact load indicated and must be guaranteed dry and level from wall to wall. If a minimum of 3'-6" cannot be achieved, contact factory for alternate arrangement.
8. A sump pump and sump pump hole with cover is recommended in the elevator pit where water seepage is encountered. A G.F.I. receptacle is required if a sump pump is furnished. Coordinate location with elevator contractor.
9. A pit light with switch and a GFI duplex receptacle in accordance with National Electric Code. Coordinate location with elevator contractor.
10. All screens, railings, steps, and ladders as required for legal hoistway.
11. Barricades outside all hoistway openings for protection shall be provided and installed by general contractors.
12. All blockouts for hall buttons must be provided. Location to be coordinated with elevator contractor.
13. The entire wall of the hoistway around each opening must not be constructed until the hoistway door frames are set. Swing door entrances are to be installed by the general contractor.
14. Adequate supports for sill angles and sills across full width of hoistway shall be furnished at each landing. Sills are to be grouted after installation.
15. All wall patching, painting, and grouting by others. Finish painting of all hoistway doors and frames by others.
16. An adjacent machine room built to conform to the layout drawings, N.E.C., ASME A17.1/CSA B44-00, and all state and local code requirements. It shall have suitable access, a lockable door, a convenience outlet, and light switch. Machine room temperature must be maintained between 60 and 100 degrees Fahrenheit. Relative humidity not to exceed 95%.
17. A 220V, single phase, 60 AMP service, with neutral, to a lockable safety disconnect switch fused with time delay fuses shall be furnished in the machine room in accordance with N.E.C. A normally open electric interlock contact is required in the switch for battery isolation. **5 horsepower** source for single phase heavy-duty switches (or equal): Square "D" Cat. #H222N, electric interlock EK-300-1; ITE Cat. #SN-322, electric interlock #SC-5. Cutler Hammer Cat. #DH222NGK, electric interlock #DS200EK1.
18. A 120VAC, single phase, 15 AMP service to a lockable fused disconnect switch or circuit breaker located in the machine room shall be provided for the cab lighting in accordance with N.E.C.
19. A telephone line to the machine room and tied into the elevator controller as per ASME A17.1/CSA B44-00 code.
20. Machine room vents if required by local code.
21. Knock-out in walls between the machine room and elevator hoistway for routing hydraulic and electrical lines shall be coordinated with elevator contractor.
22. A fixed vertical ladder to the pit floor extending 3'-6" above the lowest landing shall be provided when the pit depth exceeds 3'-0". Location to be coordinated with elevator contractor.
23. A lockable self closing 2'-0" x 2'-0" governor access door with electric contact shall be provided in accordance with layout drawing (when required).

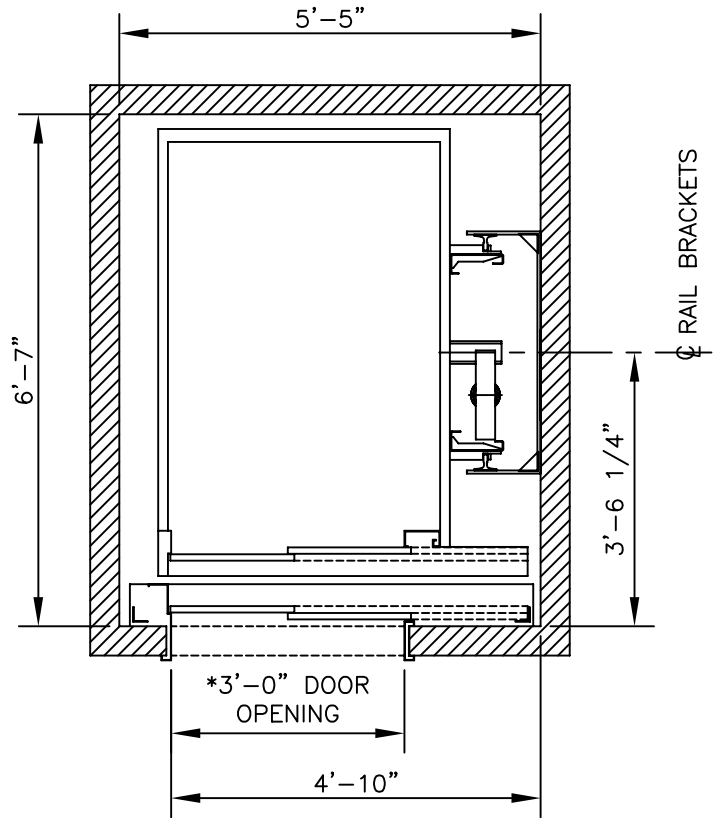
Hoistway Size Requirements

PLAN - A



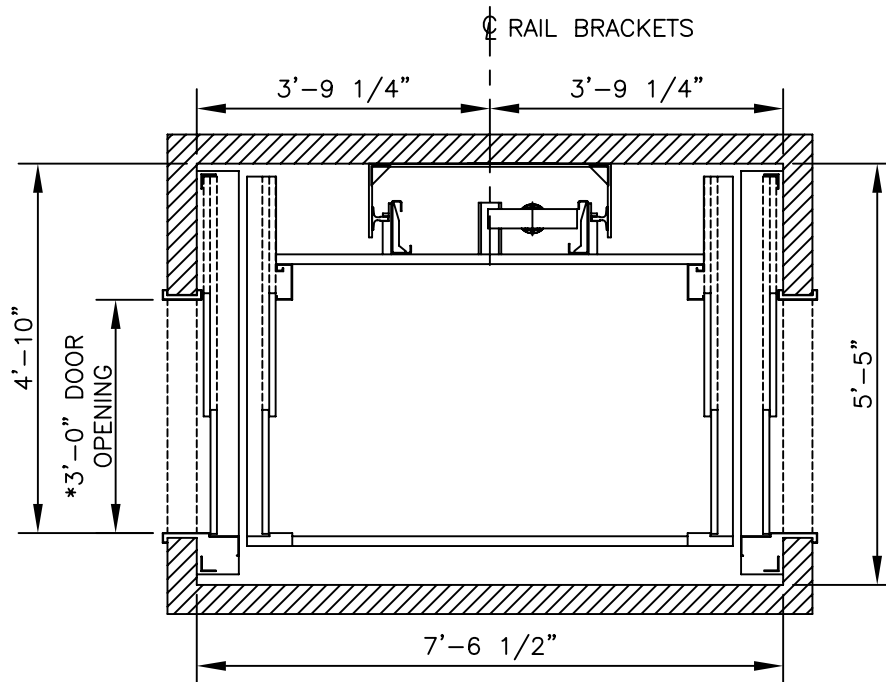
RIGHT HAND IN-LINE OPENING

PLAN - B



LEFT HAND IN-LINE OPENING

PLAN - C

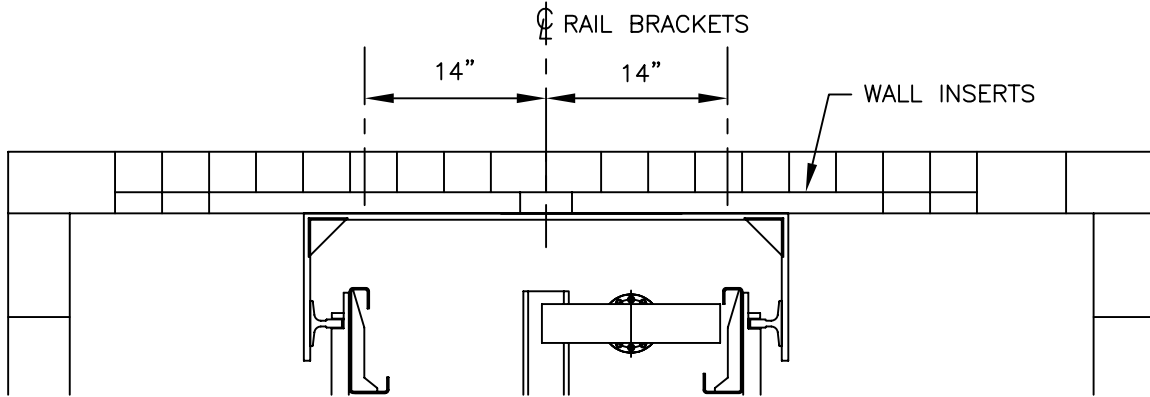


FRONT AND REAR OPENING

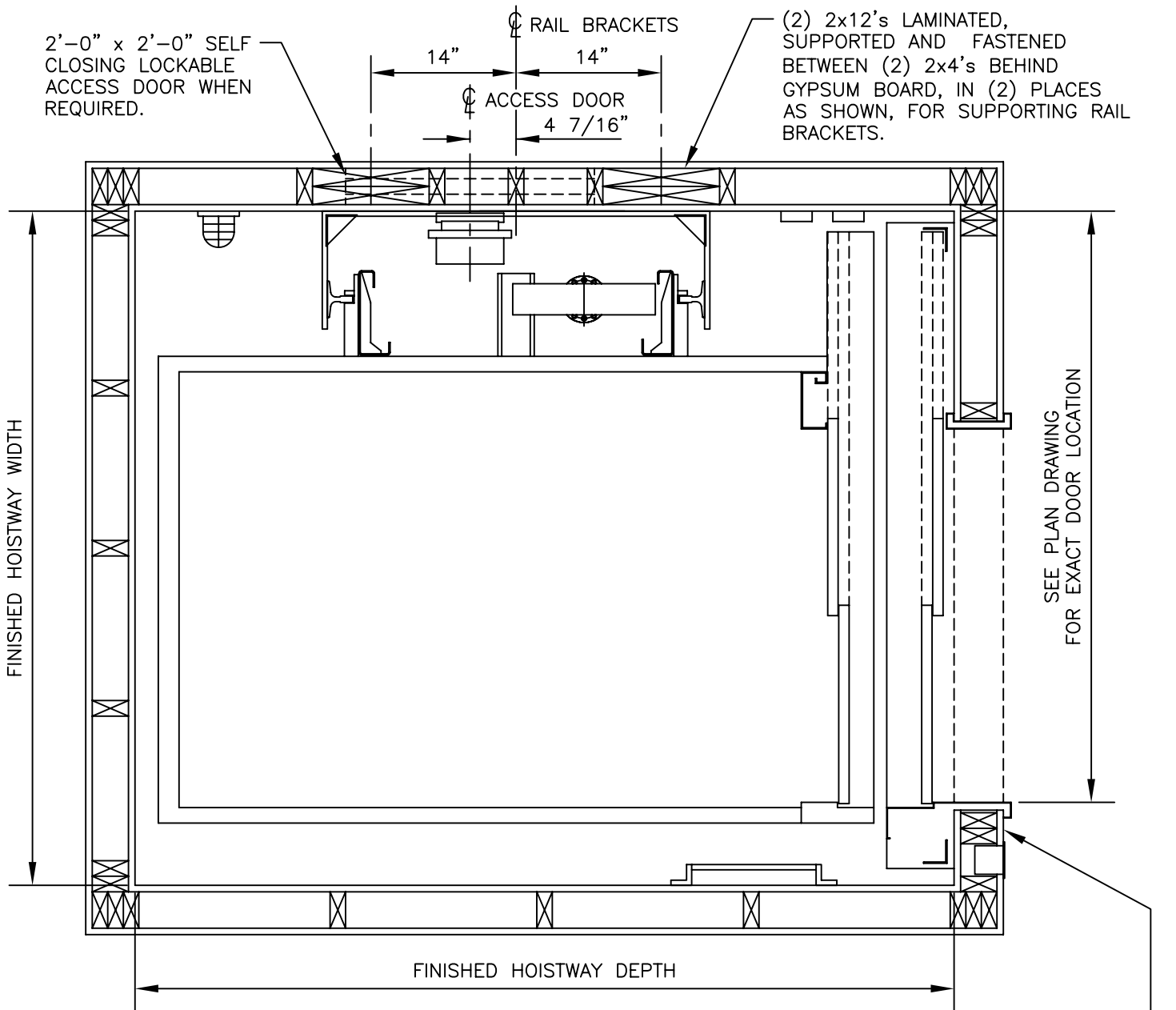
NOTE:
CONTACT CUSTOM ELEVATOR MFG. CO. FOR
CUSTOM CAR AND HOISTWAY DIMENSIONS.

* LEAVE ENTIRE FRONT WALL OPEN AROUND
EACH HOISTWAY DOOR UNTIL DOORS AND
FRAMES ARE INSTALLED.

Recommended Hoistway Construction Plan



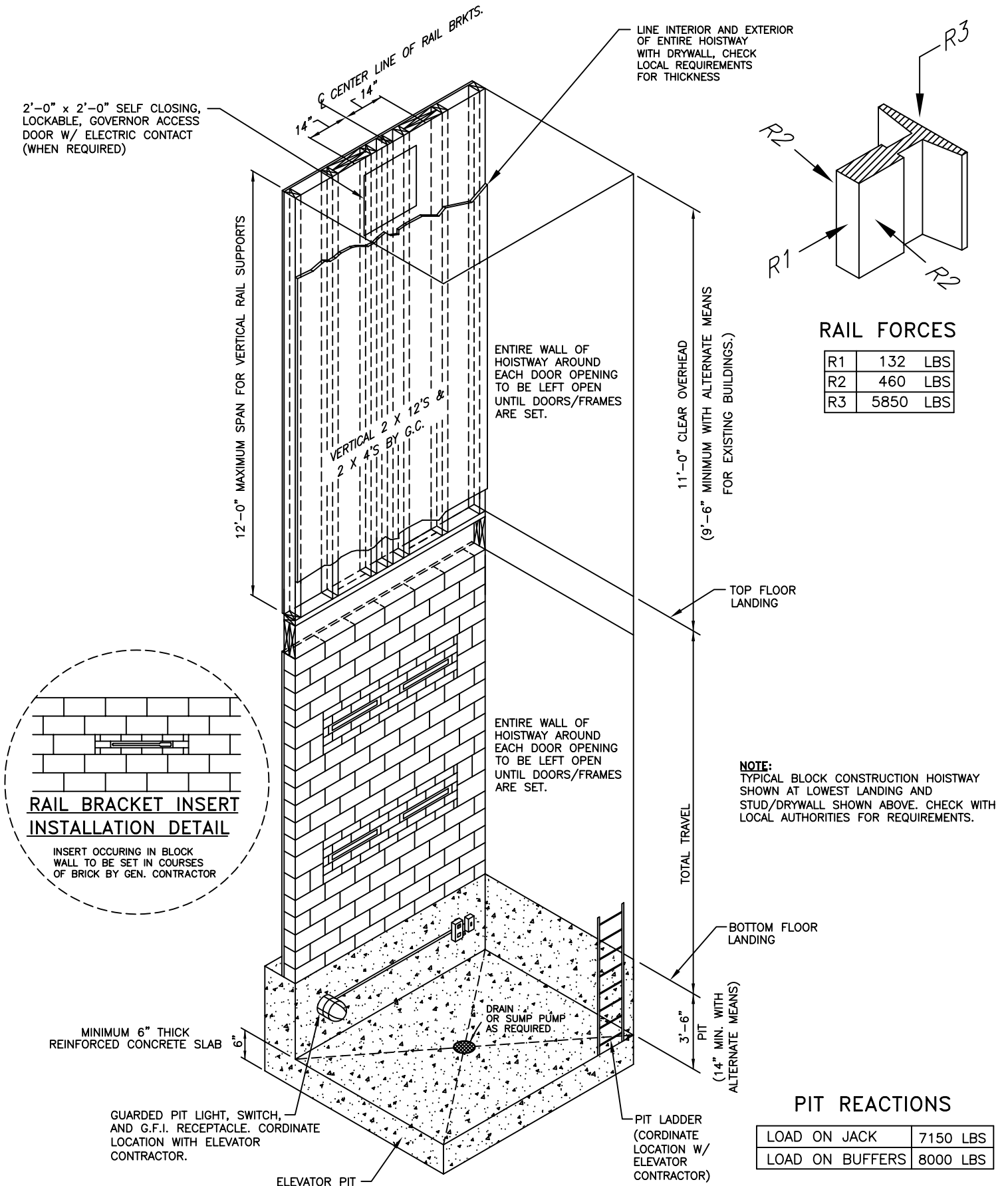
BLOCKWALL CONSTRUCTION



TYPICAL STUD AND GYPSUM BOARD CONSTRUCTION

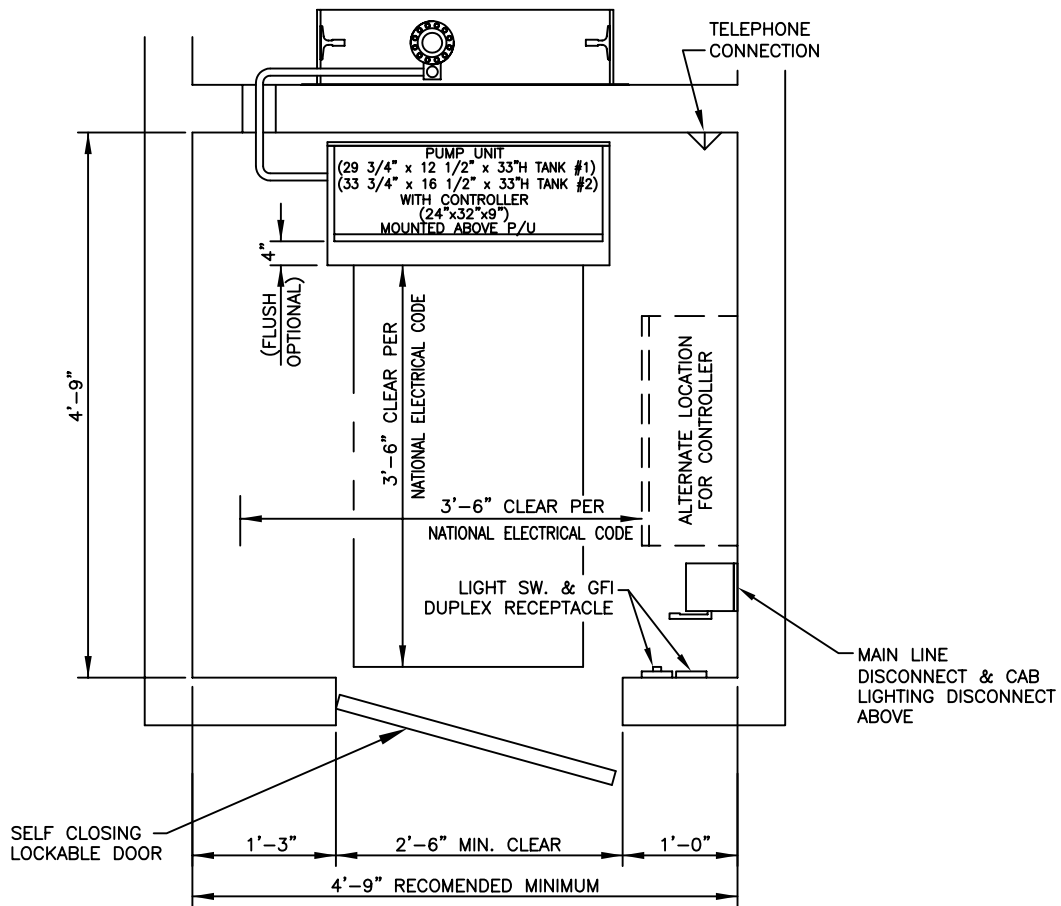
ENTIRE FRONT WALL OF HOISTWAY TO BE LEFT OPEN UNTIL HOISTWAY DOORS AND FRAMES ARE INSTALLED.

Recommended Hoistway Construction Elevation



Machine Room Plan

STANDARD MACHINE ROOM LAYOUT



NOTE

MACHINE ROOM MUST COMPLY WITH ALL STATE AND LOCAL CODE REQUIREMENTS.

MATERIAL REQUIRED BY OTHERS:

- MAIN LINE DISCONNECT (SEE SPECIAL REQUIREMENTS)
- CAR LIGHT DISCONNECT
- LIGHT, LIGHT SWITCH, AND GFI DUPLEX RECEPTACLE
- TELEPHONE CONNECTION
- HEAT
- LOCKABLE ACCESS DOOR
- KNOCK-OUT BETWEEN MACHINE ROOM AND HOISTWAY

SEE "WORK BY OTHERS" FOR MORE DETAILED REQUIREMENTS

Part 1: General

1.1 Description of Work

To furnish all labor and materials required to cover a complete installation of (one) roped hydraulic limited use/limited application (LU/LA) elevator. The elevator is to be installed in a first class workmanlike manner in accordance with the specifications and drawings provided.

1.2 Work By Others

The following preparatory work to accommodate the elevator installation is to be done by others and is part of work of other sections.

A. Hoistway

1. A finished, plumb hoistway of proper size and construction conforming to ASME A17.1/CSA B44-00, all applicable building codes, and the elevator layout drawings.
2. Adequate supports shall be provided for fastening rail brackets as indicated on the layout drawings. Supports must withstand rail forces indicated.
3. A poured pit conforming to all applicable codes and to the dimensions indicated on the layout drawings must be provided. The pit must be designed for the impact load indicated and must be guaranteed dry and level from wall to wall. A fixed pit ladder shall be provided when pit depth exceeds 3'-0".
4. Knock-out in walls between the machine room and elevator hoistway for routing hydraulic and electrical lines and for hall buttons shall be coordinated with the elevator contractor.
5. All wall patching, painting, and grouting by others. Finish painting of all hoistway doors and frames by others.
6. Adequate sill supports at each landing are to be provided for hoistway entrances. Swing door entrances (when provided) are to be installed by general contractor.
7. A lockable self closing 2'-0" x 2'-0" governor access door with electric contact shall be provided in accordance with layout drawing (when required).

B. Machine Room

An adjacent machine room built to conform to the layout drawings, NFPA 70, ASME A17.1, and all applicable building code requirements. It shall have suitable access, a lockable door, a convenience outlet, and light switch. Machine room temperature must be maintained between 60 and 100 degrees Fahrenheit. Relative humidity not to exceed 95%.

2. A telephone line to the machine room and tied into the elevator controller as per ASME A17.1/CSA B44-00 safety codes.
3. Machine room vents as required by local code.

C. Electrical Requirements

1. A 220VAC, single phase service, with neutral, to a lockable safety disconnect switch, fused with time delay fuses shall be furnished in the machine room in accordance with NFPA 70. A normally open electric interlock contact is required in the switch for battery isolation.
2. A 120VAC, single phase, 15 AMP service to a lockable fused disconnect switch, or circuit breaker, located in the machine room shall be provided for the cab lighting in accordance with NFPA 70.
3. A pit light with switch and a GFI duplex receptacle shall be furnished in accordance with NFPA 70.

1.3 Quality Assurance

The elevator shall be designed, manufactured, installed, and inspected in accordance with ASME A17.1/CSA B44-00 standards and all applicable regulations of federal, state, and local codes and ordinances as adopted by local agencies having jurisdiction.

A. References

1. American National Standards Institute (ANSI)
2. American Society of Mechanical Engineers (ASME)
3. National Electric Code (NFPA 70)
4. CSA B44.1/ASME A17.5, elevator and escalator electrical equipment requirements.
5. CSA B44-00 safety code for elevators.

B. Qualifications

The installation shall be performed by a company with no less than (5) years of successful experience in the assembly and erection of similar type elevators and who has adequate product liability insurance.

C. Regulatory Requirements

The elevator installer shall verify requirements of the local authority having jurisdiction and shall obtain and pay for necessary municipal and state permits and inspections as required, and make tests as called for by the regulations of such authorities.

Part 2: Submittals

2.1 Product Data

Submit manufacturers literature including product data, cab designs, color charts, signal fixtures, and specifications.

2.2 Layout Drawings

Layout drawings shall be submitted showing the general arrangement of the elevator equipment including dimensions, clearances, location of machine equipment, and all loads and reactions imposed on pit and building structure.

Part 3: Product

3.1 Manufacturer

The roped hydraulic LU/LA elevator shall be manufactured by Custom Elevator Manufacturing Co. Inc. Plumsteadville, PA. US. Toll Free 1-888-443-2800 or 215-766-3380 Fax 215-766-3385 and installed by _____

3.2 Characteristics

Type: Roped 1:2 Hydraulic

Capacity: 1400 lbs.

Car Speed: 30 FPM

Operation: SAPB/single button collective

Travel: (25'-0" max. per ASME A17.1)

Number of Stops:

Number of Openings:

Inside Car Dimensions: 42" X 60" X 81" high

Doors: 36" x 80" two speed, horizontal sliding

Power Supply: 220 Volt, single phase, 60 Hz.

Cab Finish:

Push Button Faceplates and Handrail Finish:

3.3 Equipment

A. Operation

Operation of the elevator shall be fully automatic. Control shall be single automatic push button or single button collective (field programmable); momentary pressure on any button will call or send the elevator to the corresponding landing and the car and hoistway doors shall open and close automatically.

1. **Battery lowering:** In the event of a power failure, the elevator shall automatically descend to the homepark landing, wait 30 seconds, then proceed to the bottom landing while monitoring all safety circuits. Elevator door(s) shall open and close automatically. Batteries are to have an automatic charging system.
2. **Emergency car lighting:** An emergency car light shall be furnished in the car operating panel that provides an illumination of not less than (.2) foot candles at a point (48) inches above the car floor

and (11) inches in front of the car operating panel for a minimum of (4) hours.

3. **Homepark feature:** The elevator shall automatically return to a field programmable designated landing after one minute without use.
4. **Automatic car light timer:** With the in car light key switch in the "on" position, the cab lights shall time out automatically after (3) minutes and illuminate automatically when the elevator is called to a landing.
5. **Automatic two-way leveling:** The leveling device shall automatically stop and maintain the car within ½ inch of the landing regardless of the change in load.
6. **Low oil control:** A low oil control feature shall be provided, designed to automatically cause an up traveling car to descend to the lowest terminal landing if the elevator should fail to reach a landing in a predetermined time or if the system does not have a sufficient reservoir of oil.
7. **Inspection operation:** Inspection operation shall be provided on the top of the car and from the main controller located in the machine room. Controller inspection shall be rendered inoperable when on top-of-car inspection. Inspection operating stations shall consist of a transfer switch and constant pressure "up", "down", and enable buttons. Top-of-car inspection station shall include an emergency stop, GFI protected duplex outlet, and a guarded light with a light switch. Controller shall be prepared with car and hoistway door bypass switches in accordance with ASME A17.1/CSA B44-00 safety codes.
8. **Hoistway access switch:** A (3) position spring return key switch shall be furnished adjacent to the top landing door used to permit movement of the car with the top landing door and car door in the open position allowing service personnel to gain access to the car top when the distance from the top of the car to the landing sill exceeds (35) inches when the car is level with the landing below.

B. Control System

A microprocessor based control system certified and labeled to the requirements of CAN/CSA-B44.1/ASME A17.5 shall be provided. It shall include a motor starter with a potential relay, motor overload device, an uninterrupted power supply with battery charging circuit, and redundant device circuits that prevent the car from moving in the occurrence of a single ground or failure of any critical circuit contactors or relays and such devices shall be monitored prior to each start to assure that these devices are functioning in their intended manner. All circuits shall be fuse protected. All to be enclosed in a single key lockable cabinet.

C. Hydraulic Power Unit

The hydraulic power unit shall include a submersible motor, rotary screw type pump, two-speed control valve, and oil reservoir with an oil level gauge. The control valve shall include a safety check valve, up and down acceleration, deceleration, leveling, and soft stop adjustments, pressure relief valve, manual lowering valve, constant down speed regulation, pressure gauge with shutoff, negative pressure switch, and manual shutoff valve all mounted and enclosed in a compact unit assembly with a key lockable cover.

D. Plunger and Cylinder

The cylinder shall be constructed of steel pipe with a steel bulkplate welded to the lower end and a cylinder head welded on the upper end which houses the self-adjusting packing, bearings, wiper, air bleeder, and leach line hose.

The plunger shall be manufactured from accurately ground and polished tubing fitted with a steel stop ring welded to the bottom to prevent the plunger from leaving the cylinder in the up direction.

E. Pipe Rupture Valve

An automatic shut off valve at the cylinder inlet shall be provided to stop and hold the elevator in the event of a main oil line failure or if the elevator should overspeed in the down direction.

F. Car Frame and Platform

The car frame shall be fabricated from structural and formed steel members, welded and bolted construction, of the cantilevered design. It shall be fitted with roller guide shoes, car safeties, and a slack cable switch that will disconnect power to the control valve if a rope should become slack or broken. The car platform shall be fabricated from steel framing covered with plywood protected with a fire retardant material. A toe guard shall be provided at each car entrance extending below the platform.

G. Car Suspension

The elevator car frame shall be suspended by (3) 3/8" diameter, 6 X 19, traction steel cables. The cables shall dead end to the pit steel on one end, pass over a "U" groove sheave, and attach to the car safety device with approved type wedge sockets.

H. Overspeed Governor

An overspeed governor shall be provided in the overhead and a tension weight with idler sheave shall be located in the pit. The governor cable shall be ¼" 8 x 19 traction steel and attach to the car safety device. The governor shall be designed to activate the car safeties in the event of an overspeed in the down direction. Governor shall be self resetting and be provided with means to seal the tripping speed adjustment.

I. Guide Rails

The car guide rails shall consist of (2) machined steel "tee" sections, no less than 8 lb. per foot, securely fastened to the hoistway structure with steel brackets. All rail end sections shall be tongue & groove type joined with steel splice plates.

J. Spring Buffers

Spring buffers shall be furnished in the pit when pit depth exceeds (21) inches. Buffers shall have sufficient load and stroke ratings in accordance with applicable codes.

K. Car Operating Panel

Car operating panel shall consist of metal lens call pushbuttons with red LED halo lighting and Braille tags for each landing, door open buttons, an alarm button, emergency stop key switch. Light key switch, emergency light, integral phone box with telephone, and a digital car position indicator with direction arrows and audible signal all mounted onto a brushed stainless steel faceplate.

L. Landing Controls

Landing control stations shall consist of a metal lens call button with red LED halo lighting mounted onto a brushed stainless steel faceplate.

M. Hoistway Doors

Each hoistway entrance shall consist of a two speed horizontal sliding reinforced hollow metal UL-B 1-1/2 hour fire rated door and frame assembly with prime (paintable) finish and extruded aluminum sill. Each opening shall be protected with an electro-mechanical interlock to prevent operation of the elevator unless all doors are closed and locked.

N. Car Doors

Each car entrance shall be provided with a two speed horizontal sliding reinforced hollow metal door panels faced with brushed stainless steel finish. An electric contact shall be provided on each car door opening to prevent operation of the elevator unless the car door(s) are in the fully closed position. Car doors shall be equipped with a zone lock used to prevent opening of the car doors unless the car is within a landing zone.

O. Door Operator

A heavy duty DC master door operator with adjustable speed and torque shall be provided for each cab opening operable even during a power failure. Door operation shall be smooth and quiet through belt transmission and door movement shall be cushioned or checked at both limits of travel. Car doors shall be equipped with a clutch used to unlock and control the individual landing doors. Doors shall open automatically at each landing upon arrival of the car then close after a predetermined time interval

P. Door Safety Edge

Each car door shall be equipped with a full height infrared light curtain that will cause the doors to stop and reverse when closing if an obstruction is detected in the door openings. The door shall return to its open position and remain open for a predetermined time then close automatically.

Q. Door Hangers and Tracks

Door hangers and tracks shall be provided for each car and hoistway entrances. Track shall be rolled steel with working surfaces contoured to match the door Hanger rollers. Hangers shall be designed for two point suspension of each door panel and shall be equipped with up thrust rollers on each hanger assembly including a secondary upthrust retainer device. A cable drive shall be used to transmit motion from one car door panel to the other and a secondary door interlock devices shall be furnished to prevent the doors from ever separating. All hanger rollers shall have polyurethane tires with pre-lubricated and sealed bearings.

R. Car Enclosure

1. WALLS: ¾" thick fire rated wood core panels with plastic laminate faced interior and black-filled reveals to simulate applied panels.
2. CAR ENTRANCE: Strike column, return post, and transom shall be #4 brushed stainless steel.
3. CAR DOORS: Two-speed, side slide reinforced hollow metal construction faced on the interior with #4 brushed stainless steel finish.
4. CANOPY/LIGHTING: Canopy shall be steel with baked enamel white finish. Florescent lighting above a removable thermoclear panel drop ceiling supported in a aluminum "T" frame shall be furnished.
5. HANDRAIL: 3/8" x 2" #4 brushed stainless steel handrail shall be furnished on (1) side wall.
6. VENTILATION: Adequate protected vent openings shall be furnished in the car canopy and cab wall base.

S. Electrical Wiring

All wiring and electrical materials shall conform to NFPA 70 and with all applicable codes. Insulated wiring shall have flame-retardant and moisture proof outer covering and shall be run in conduit or electrical wireways as required. Traveling cables shall be flexible and suitably suspended to relieve strain. A pit stop switch located near and accessible from the lowest landing hoistway door shall be furnished.

T. Accessories

1. Cab Options

- Steel baked enamel finish wall panels
- #4 brushed stainless steel wall panels
- #4 brushed stainless steel base (kickplates)
- Protection pads and hooks
- Car top emergency exit
- Exhaust fan
- Plastic laminate faced car door(s)
- #4 brushed bronze metal finishes
- Custom car sizes (consult factory)

2. Door Options

- Fire rated accordion car door(s) available in chalk, light oak, or aluminum finish in lieu of two speed horizontal sliding doors
- Automatic car door operator for accordion car door(s)
- 36" x 80" fire rated swing door entrance(s) with prime (paintable) finish in lieu of two speed horizontal sliding doors. Swing doors include hinges, passage sets, delay action closers, and vision panel in door.
- Low energy fully automatic power swing door operator(s)
- #4 Brushed stainless steel entrances (two-speed only).
- Plastic laminate doors (two-speed only).
- Baked enamel hoistway entrances (two-speed only).

3. Controls/Pushbutton Options

- Digital hall position indicators with direction arrows incorporated into the hall call station
- Car travel lantern with audible signal
- Fire service phase I and II with alternate return floor
- ADA compliant phone
- #4 brushed bronze faceplate/button finishes
- Keyed control switches in car and/or hall

4. Other Options

- Direct acting hydraulic in lieu of roped 1:2
- 208/230/480 volt, 3 phase power
- Car top/bottom stopping devices (alternate means)
- Remote-set solenoid on governor for testing from the machine room.
- Tank heater

Part 4: Execution

4.1 Examination

Elevator installer shall verify dimensions of hoistway, pit, machine room, and inspect conditions of supports and structure prior to installation.

4.2 Installation

The elevator shall be installed in accordance with the manufacturer's instructions and shall conform to ASME A17.1/CSA B44-00 and all state and local code requirements.

4.2 Operating Instructions

Upon completion of the installation, the owner shall be instructed on the elevator's operation, safety precautions, and maintenance requirements. The owner shall be supplied with an owner's manual to retain for reference.

4.3 Maintenance

The elevator shall be maintained in accordance with the manufacturer's recommendations and all applicable codes.

4.4 Warranty

The elevator shall have a (2) year limited parts warranty.