

# FREEDOM 750

## RESIDENTIAL ELEVATOR

### **Planning Guide** Roped Hydraulic Residential Elevator

**Applicable Codes:**  
ASME A17.1 – 2000 Part 5, Section 5.3  
CAN/CSA B44 – 2000 Part 5, Section 5.3

Effective April 2007

# General

This planning guide is designed to assist architects, contractors and lift professionals in planning for a FREEDOM 750 Residential Elevator to meet the requirements of ASME A17.1 - 2000 Part 5, Section 5.3 and CAN/CSA B44 - 2000 Part 5, Section 5.3

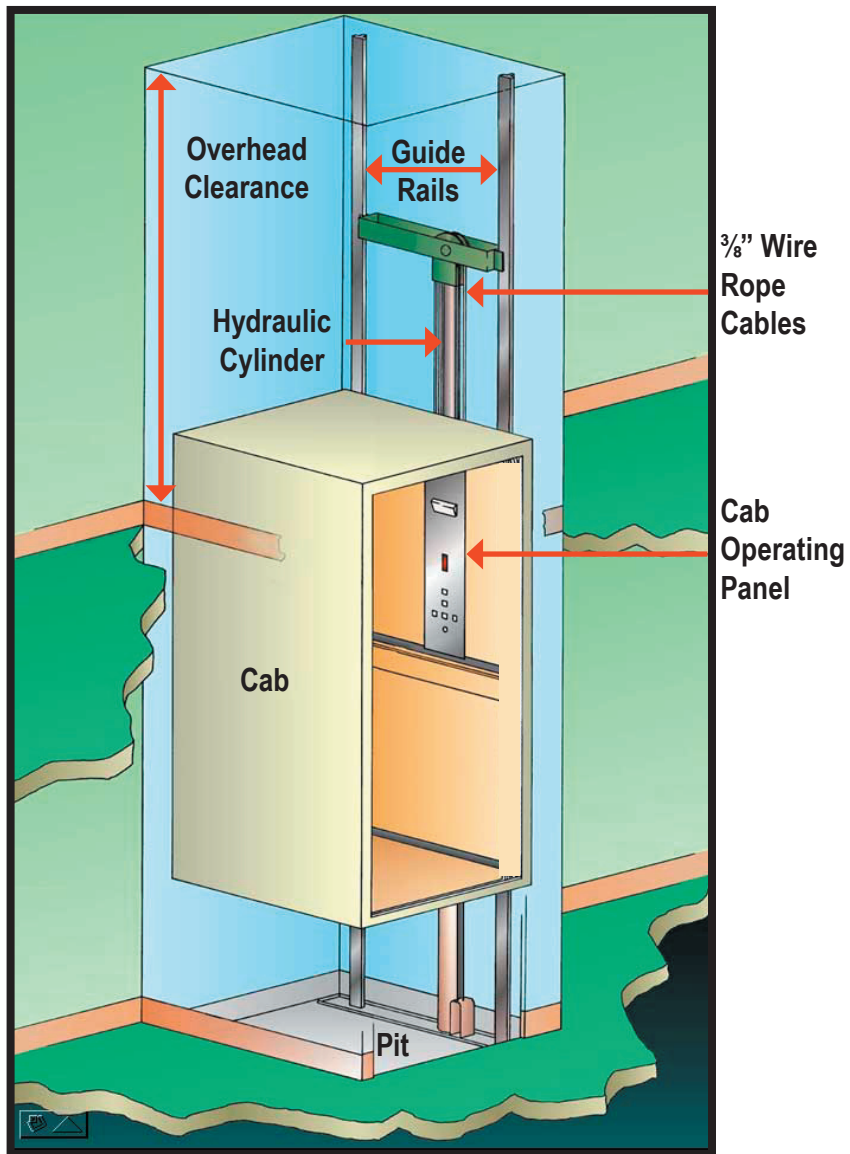
We strongly recommend that you contact the code authority having jurisdiction in the area(s) where the lift will be installed to become familiar with all the legal requirements governing the installation and use of lifts in commercial applications. It is extremely important for you to know and adhere to all regulations pertaining to the installation and use of lifts.

## **IMPORTANT NOTICE**

This Planning Guide provides nominal dimensions and specifications useful for the initial planning of an lift project. Before beginning actual construction, be sure to receive application drawings customized with specifications and dimensions for your specific project.

- Determine customer's intention for use.
- Determine code requirements of site.
- Determine installation parameters of site.
- Use page 6 to determine the car type and hoistway size requirements.
- Use pages 7 and 31 to plan for machine room and electrical requirements.

# Product Description

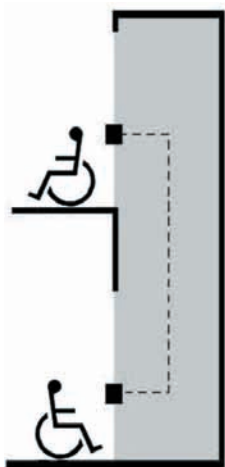
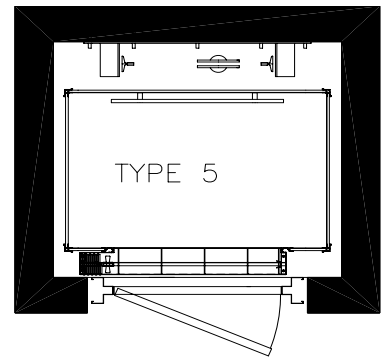
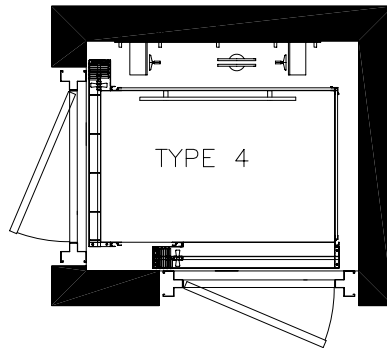
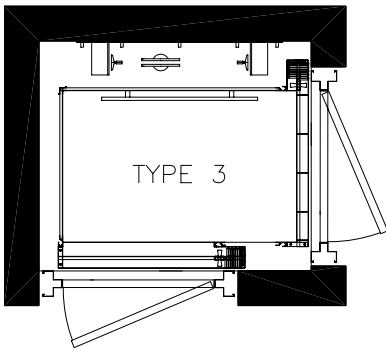
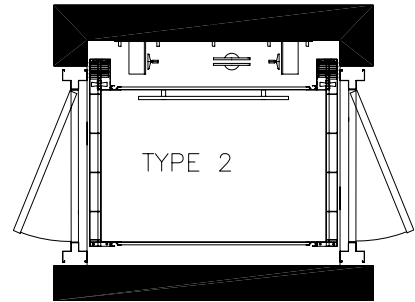
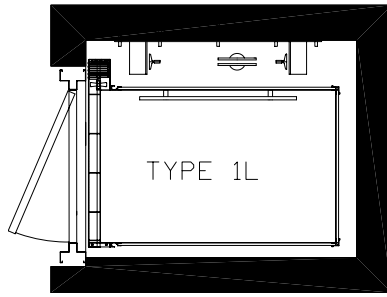
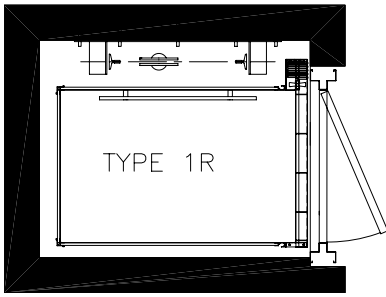


**FREEDOM 750 in Hoistway**

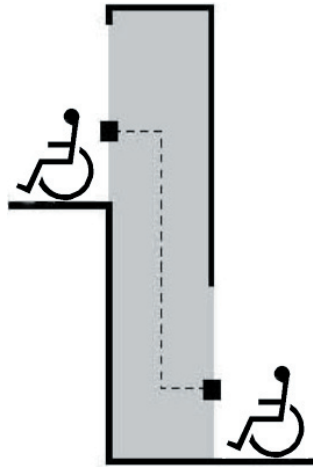
# FREEDOM 750 RESIDENTIAL ELEVATOR SPECIFICATIONS

Load Capacity	750 lb (340 kg), 1000 lb (454 kg)
Rated Speed	36 fpm (0.18 mps)
Power Supply (circuit to be supplied by others)	208 volt, three phase, 60 Hz, 30 amps or 230 volt, single phase, 60 Hz, 30 amps
Lighting Supply (circuit to be supplied by others)	115 volt, 60 cycle, 15 amps
Drive System	1:2 Cable Hydraulic with Slack Cable Safety Device 3 hp submersed motor Two 3/8" diameter steel aircraft cables Rope wedge sockets
Cab Size	W36" x L48" x H80" (914 mm x 1219 mm x 2032 mm), Type 1, 2, 3, 4, 5 W36" x L54" x H80" (914 mm x 1371 mm x 2032 mm), Type 1, 2, 3, 4, 5 W36" x L60" x H80" (914 mm x 1524 mm x 2032 mm), Type 1, 2, 3, 4, 5
Cab Panel Finish	Solid Melamine or MDF Panels (standard), Unfinished Oak Veneer Panels (optional), Finished Recessed Veneer Panels (optional), Solid Hardwood Raised Panels (optional)
Maximum Travel	50 feet (15.24 m)
Control System	Automatic User Interface Solid State Electronics with Relay Logic Motor Controls
Levels and Openings	5 Stops and 2 Openings
Pit Depth Required	8" (203 mm) minimum up to 96" (2438 mm)
Minimum Overhead Clearance	92" (2337 mm) for standard 80" cab, 108" (2743 mm) for 96" cab
Hall Station and Control Panel Finish	Clear or Bronze Anodized Aluminum (standard) or Stainless Steel (optional) or Brass (optional) Rectangular (standard) or Oval (optional) Hall Stations, Keyless (standard) or Keyed (optional)
Standard Features	Anti-Creep Device Automatic Cab ON/OFF Lighting Cab Gate Safety Switch Car Top Stop Switch Clear or Bronze Anodized Aluminum Cab Entrance Trim and Handrail Data Plates, Capacity Tags and Rope Tags Emergency Stop and Alarm Buttons Emergency Battery Back-up for Lighting, Alarm and Emergency Lowering Upper and Lower Terminal Limits Limited Warranty (covers the repair or replacement of any defective parts for a period of 36 months from date of shipment) Magnetic Floor Selection, Stopping and Re-leveling Manual Reset Slack Rope Safety Switch Mechanical Rail Shoring Blocks Negative Pressure Switch Pit Switch Presentation Drawings Pump Run Timer Rail Sections (8 ft optional or 16 ft standard) Two 12 V, 4 AH, Sealed No Maintenance Batteries with 24 V, 4 amp Smart Charge™ Battery Charge Unfinished Plywood Sub-Floor Variable Speed Pressure Compensated Valve with Manual Lowering White Ceiling with Recessed Incadescent Down Lights
Options	96" High Cab Automatic Gate Operator (accordion gates only) Automatic Swing Door Operator Buffer Springs (13" Pit Depth Minimum) Emergency Hands-Free Telephone Finished Oak Hardwood Flooring Hose with Flow Control Valve (15 ft, 20 ft or 25 ft) In Car Digital Floor Indicator Interlocks for Doors by Others (Kwiklock or GAL) Keyed ON/OFF Control Panel and Hall Stations Lamp Style Hall Position Indicators Light Screens Pipe Rupture Valve Split Cylinder for Travel over 384" (9754 mm)

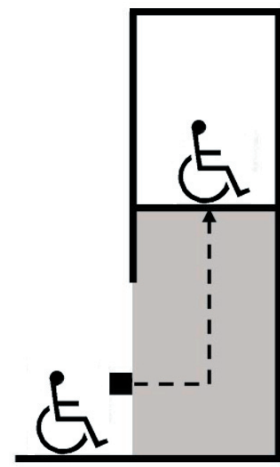
# Cab Type Selection Sheet



Type 1 and 5



Type 2

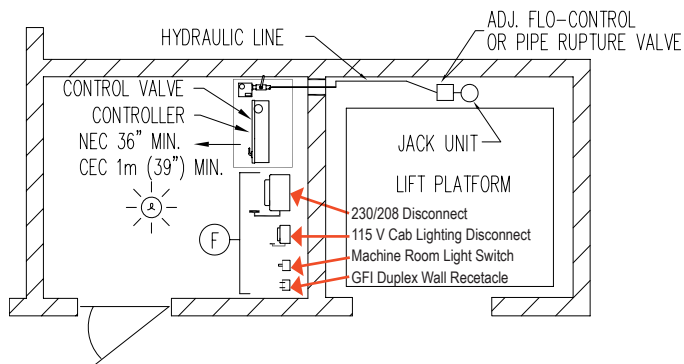


Type 3 and 4

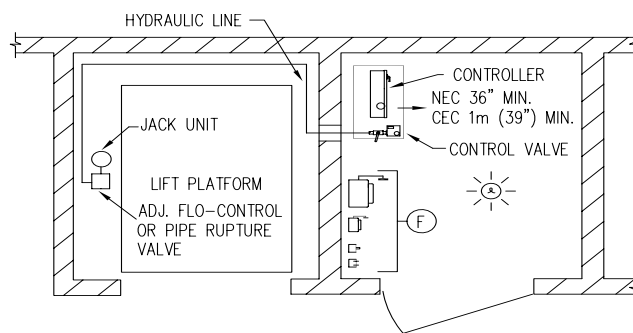
## IMPORTANT

Finished hoistway dimensions must include the drywall. Determine the fire rating of the hoistway, the type and layers of sheet rock and build only off the final shop drawings specific to your project.

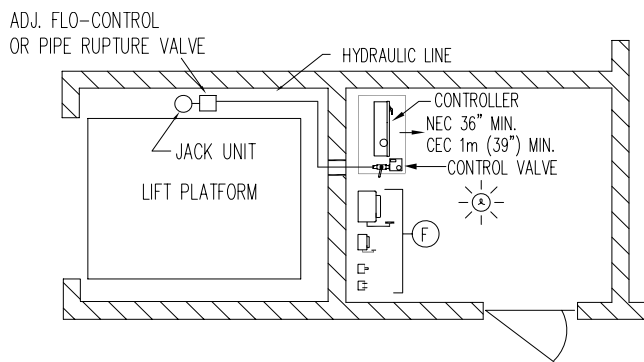
# Machine Room Options



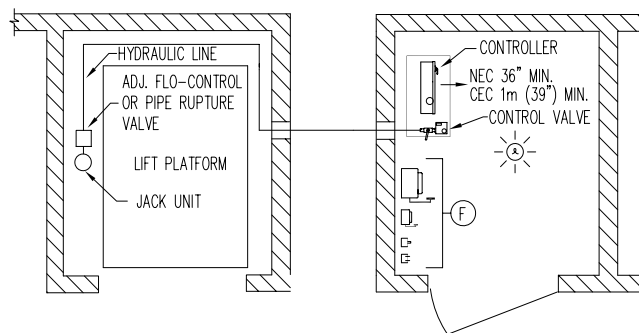
**Left Hand Position**



**Right Hand Position**



**Back Position**



**Remote Position**

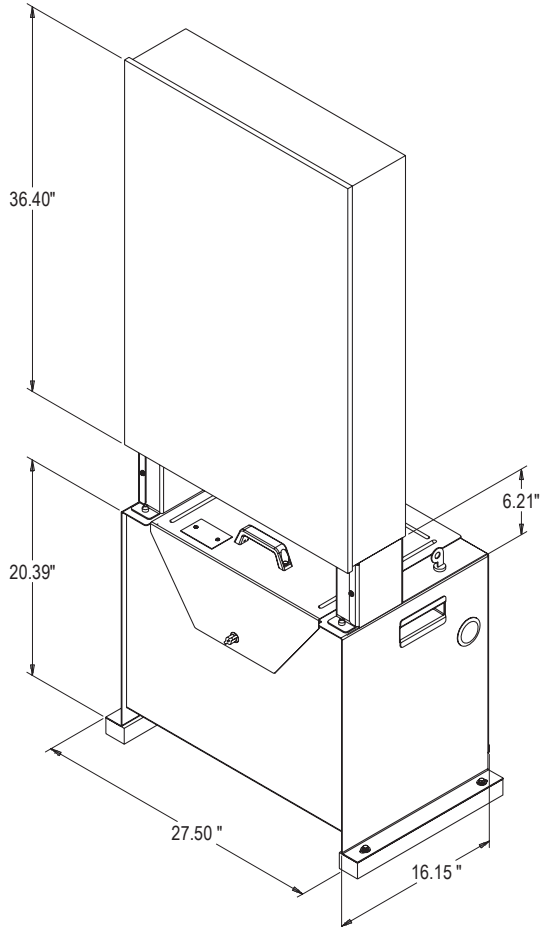
- The machine room must be built in accordance with local, state/provincial and national codes. Adequate ventilation is required to maintain a temperature of 50°F to 100°F for output of 3600 BTU per hour.
- Power supply must be 208V 3ph with 30 amp OR 230V 1ph with 30 amp dedicated circuit with equipment ground. A lockable fused disconnect with an auxiliary normally open interlock switch must be located next to the controller. The electrical circuit must terminate on the line side terminal lugs of the disconnect. It is provided and installed by others.
- The machine room lighting shall be a minimum of 19 foot candles at working surfaces.
- The switch for the light must be within 18" of the strike side of the machine room door.
- The switch, light and wiring are provided and installed by others. The light must be guarded to prevent accidental breakage of contact with the hot bulb. The switch, light, wiring and guard are provided and installed by others.
- A convenience outlet for the cab lights of 115V 1ph 15 amp single phase with G.F.I. shall be located next to the light switch in the machine room, provided and installed by others. NEC requires a 30" wide x 36" deep work space in front of the disconnects and the lift controller.
- The machine room must be free of any pipes, wiring and obstructions not related to the operation of the lift. Provide a 4" conduit from the lift shaft to the remote machine room.

# Controller Tank Specifications

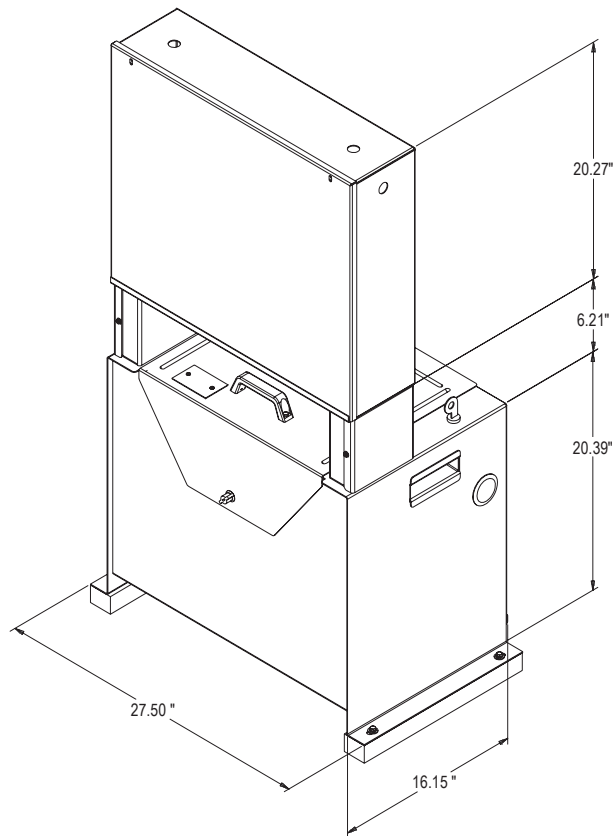
Dimensions (inches)	H 47" x W 28" x D 17" (Relay Brd) H 63" x W 28" x D 17" (PLC - 5 stop option only)
Minimum Required Clearance in Front (inches)	39"
Valve and Manual Lowering Handle Location	Inside Tank
Rupture Valve Test	T-fitting factory installed
Tank to Controller Wiring	Quick connect valve and motor wiring
Controller Layout	PLC or Relay Board
Keyed Lock to Tank	Yes
Machine Room Required	No (with local jurisdiction approval)
Tank Capacity (gal/ltr)	15-16.5 gal/57-63 ltr
Tank Oil Grade (gal/ltr)	32 Grade Hydraulic Oil, min.6.6 gal/ 25 L depending on travel
Max. Dry Weight (lbs/kgs)	147 lbs/55 kg
Max. Filled Weight (lbs/kgs)	312 lbs/117 kg
Operating Environment	50°F - 120°F /10°C - 49°C
Operating Volume	57 dBA

## Controller Tank Features

- Hydraulic Hose Connection Ports on either side of the tank
- Built in handles on either side of the tank
- Isolation mounting of pump motor valve assembly minimizes operating noise

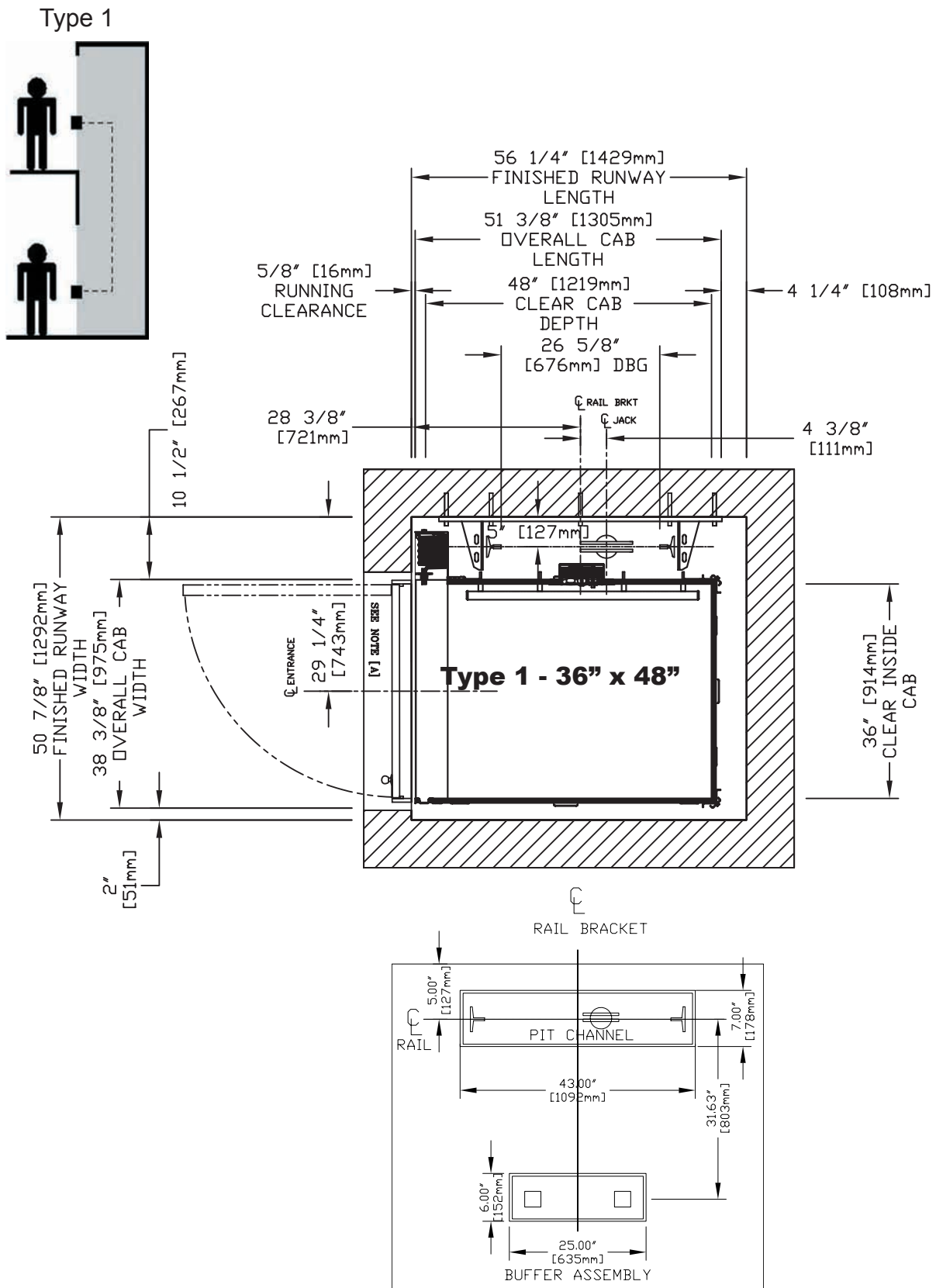


PLC Controller Tank



Relay Board Controller Tank

# 36" X 48" TYPE 1 LEFT HAND – ENTER/EXIT SAME SIDE

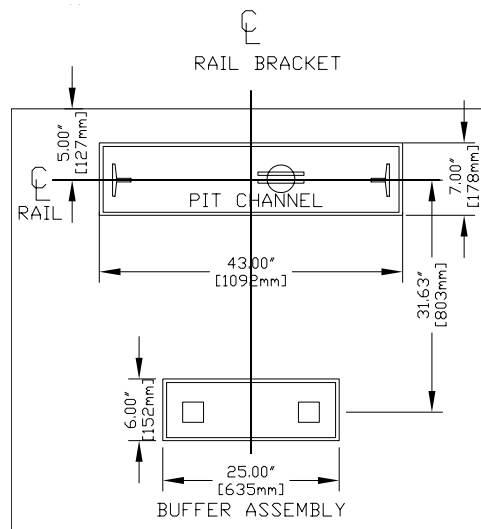
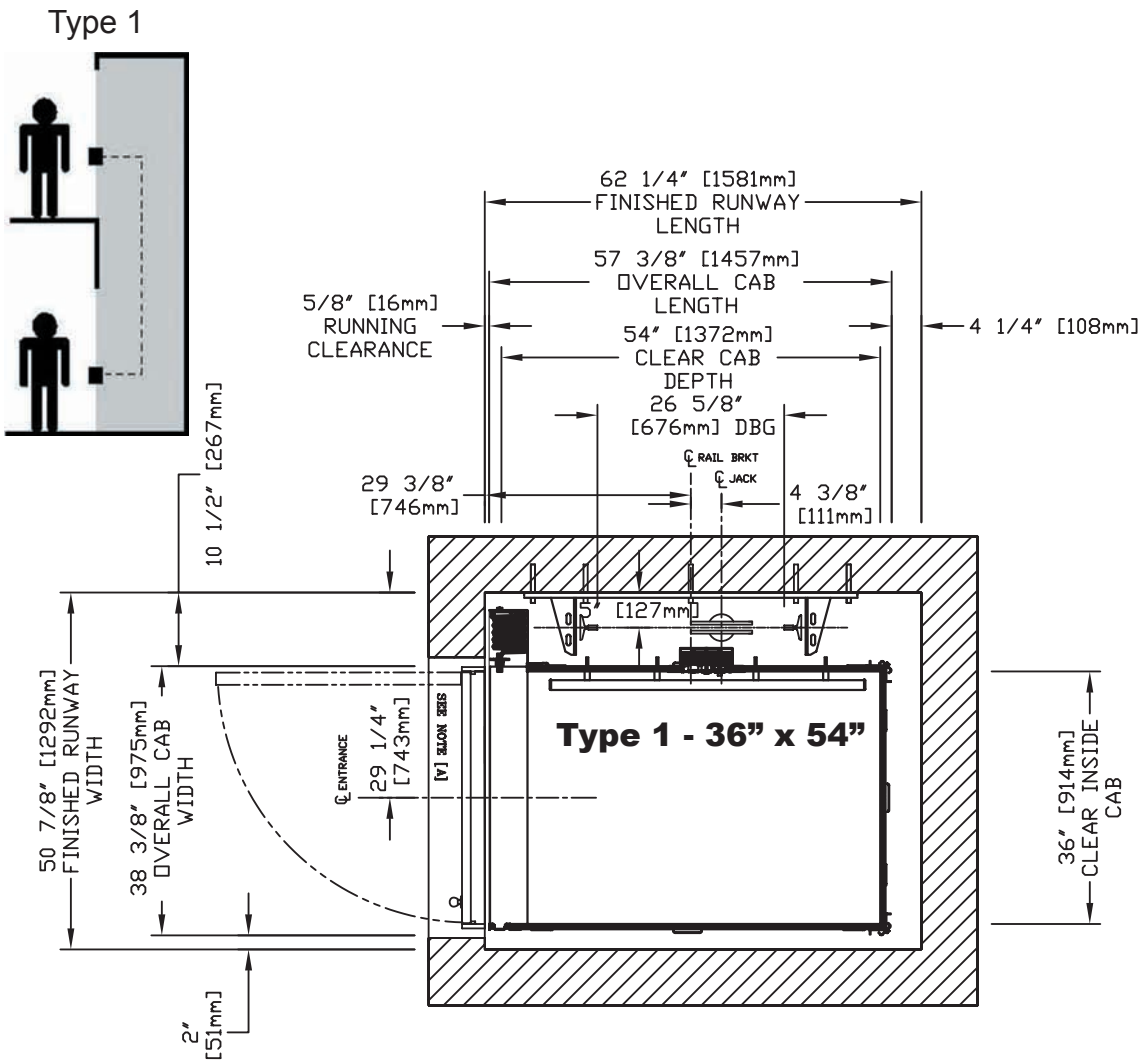


## NOTE

Plan view drawing can be reversed for Right Hand applications.



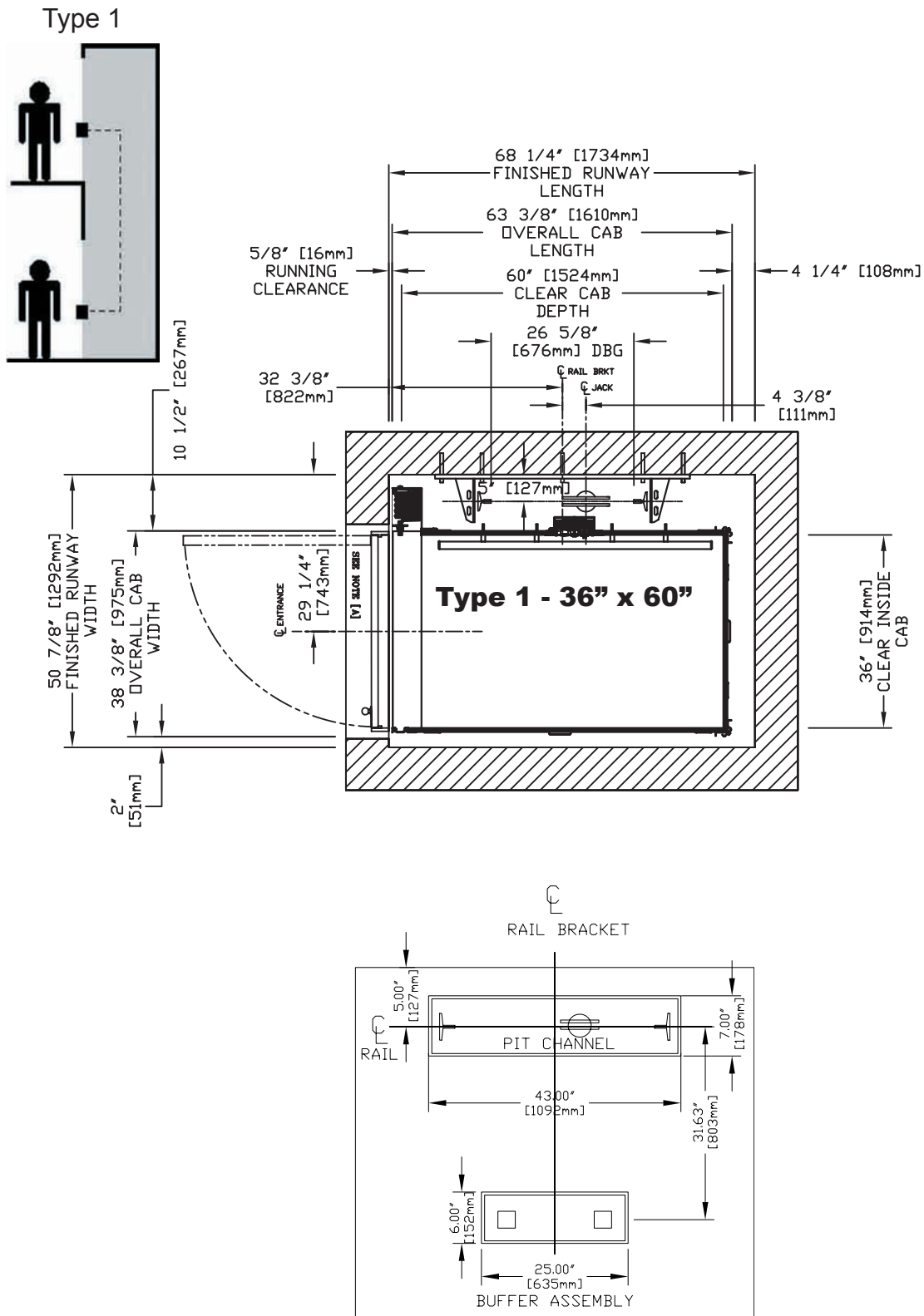
# 36" X 54" TYPE 1 LEFT HAND - ENTER/EXIT SAME SIDE



## NOTE

Plan view drawing can be reversed for Right Hand applications.

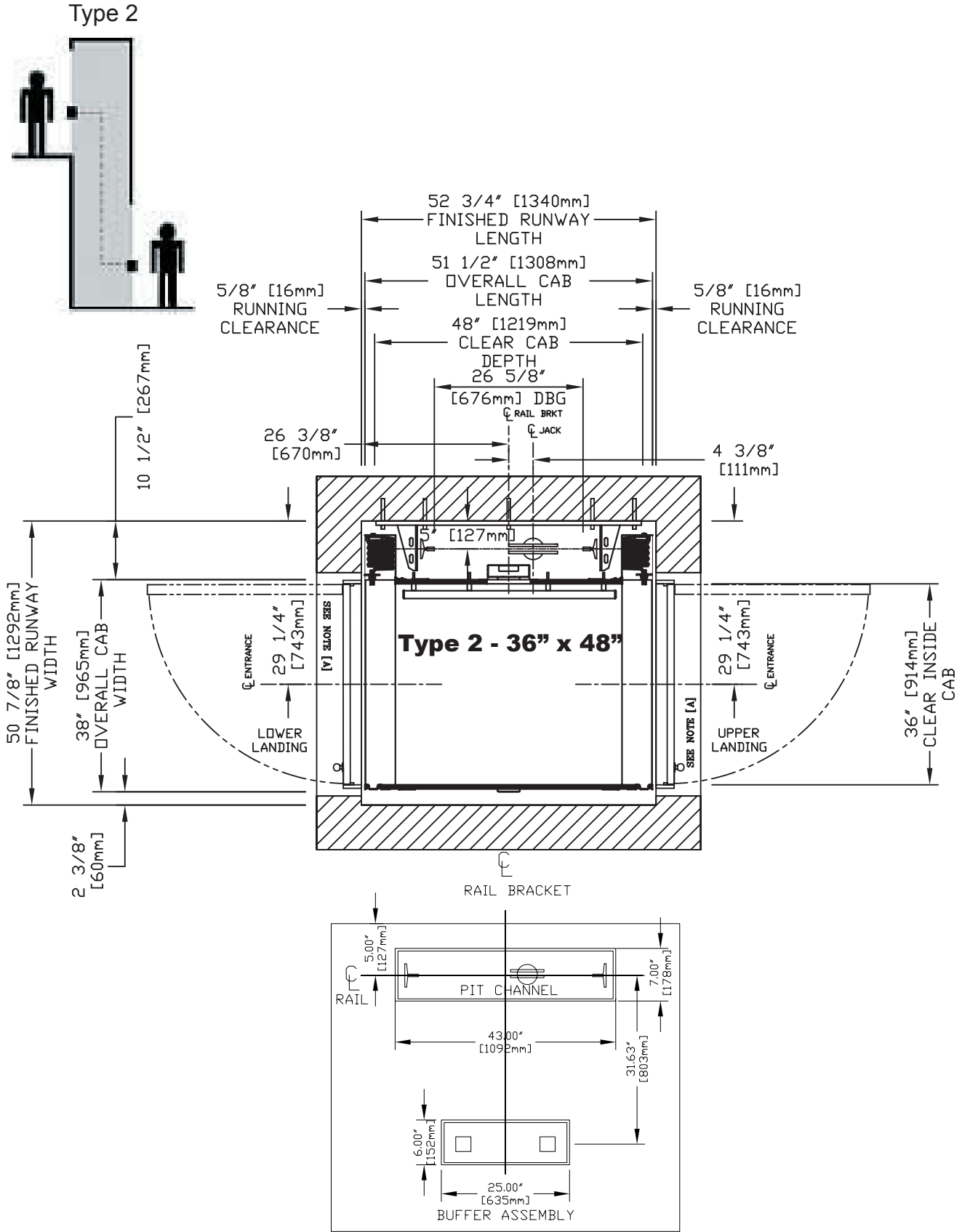
# 36" X 60" TYPE 1 LEFT HAND – ENTER/EXIT SAME SIDE



## NOTE

Plan view drawing can be reversed for Right Hand applications.

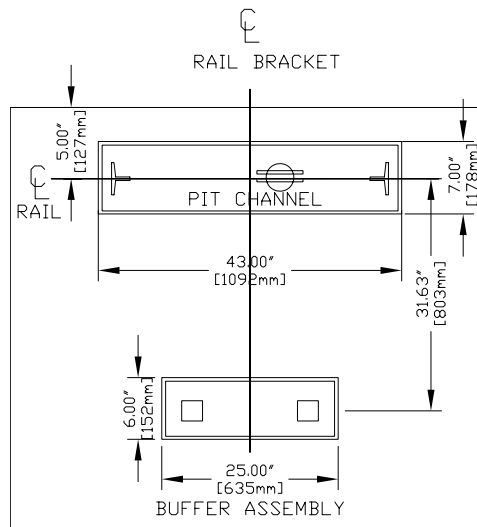
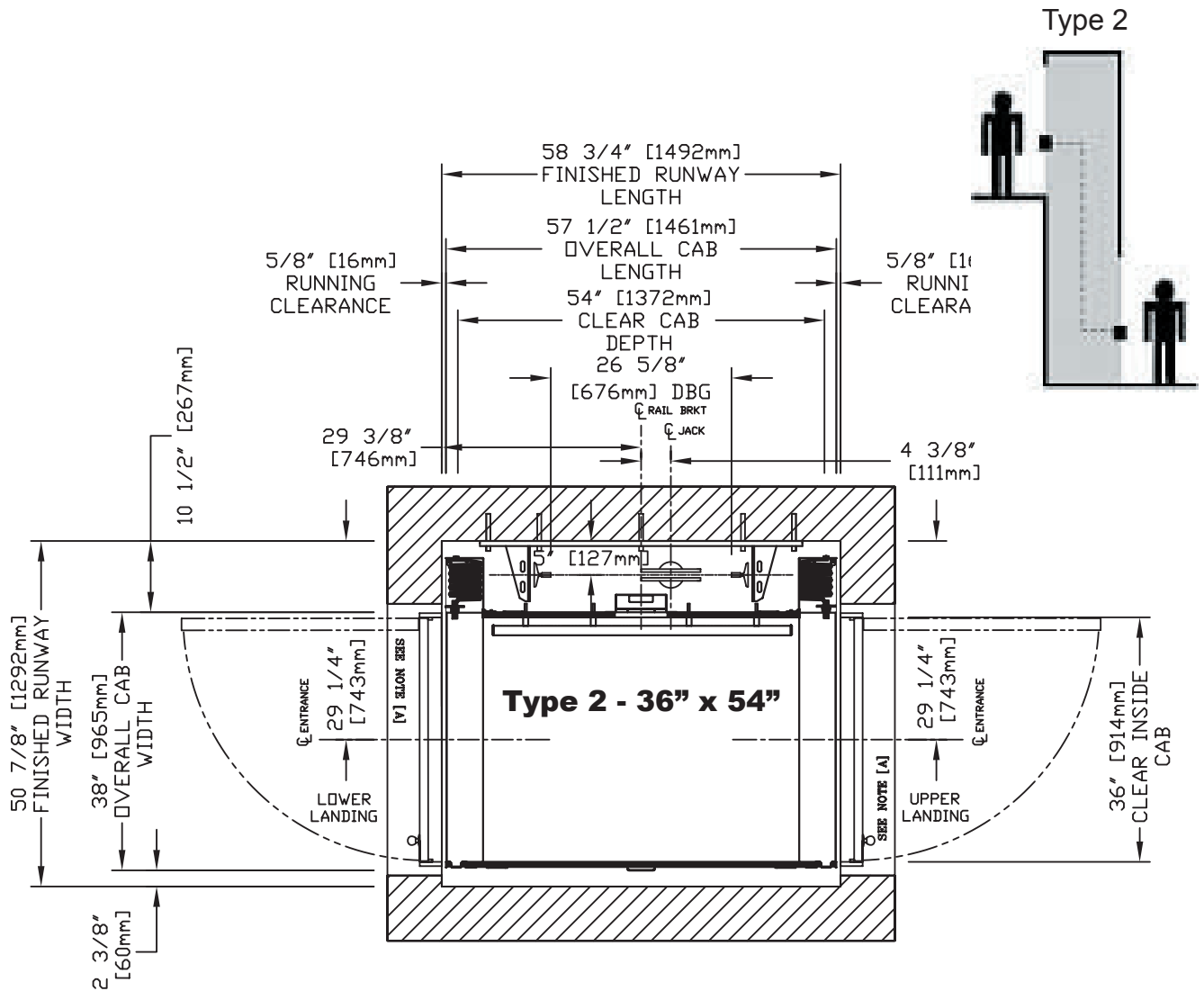
# 36" X 48" TYPE 2 WALK THROUGH – ENTER/EXIT EITHER SIDE



**NOTE**

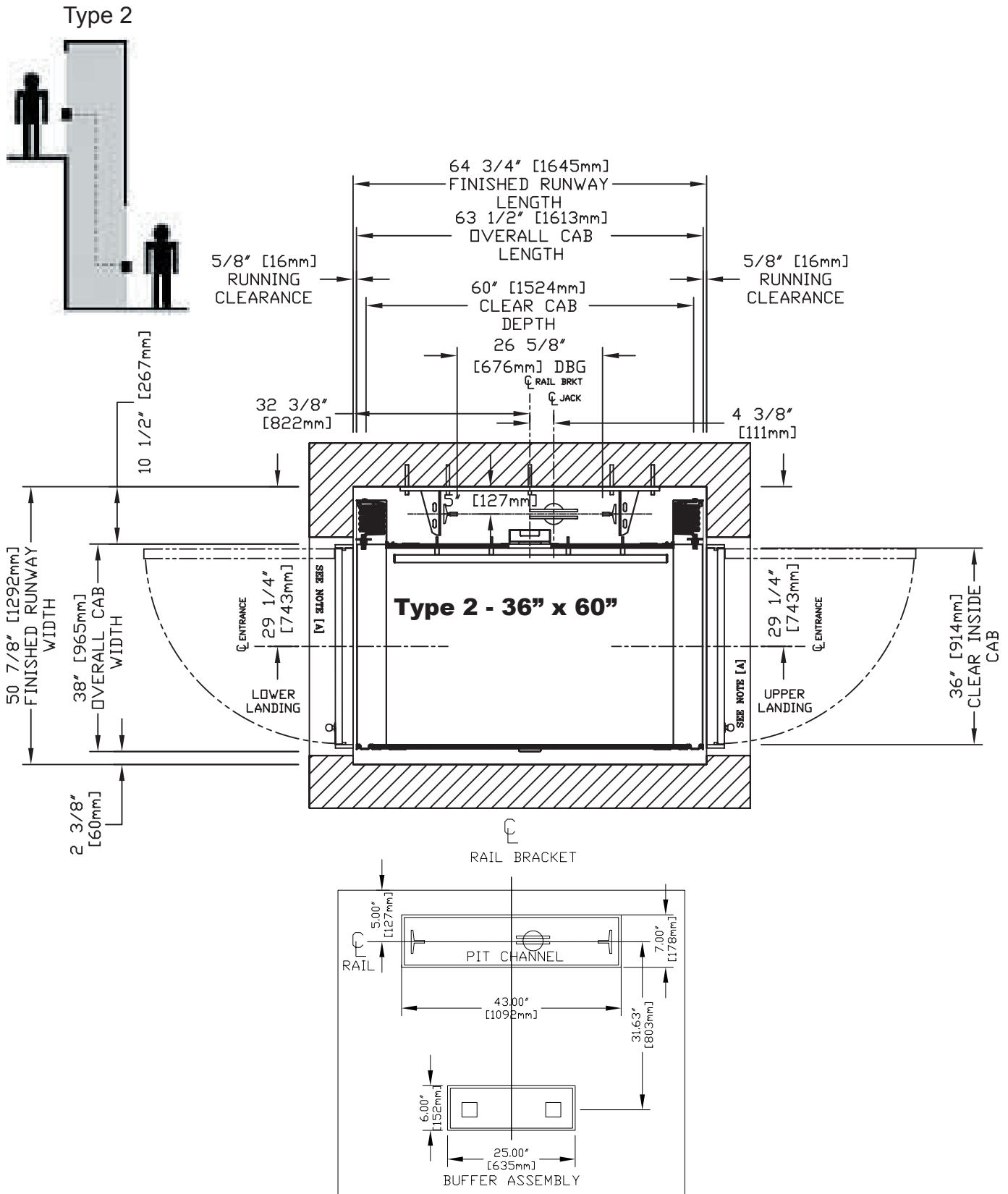
Plan view drawing can be reversed for Right Hand applications.

# 36" X 54" TYPE 2 WALK THROUGH – ENTER/EXIT EITHER SIDE



**NOTE**  
Plan view drawing can be reversed for Right Hand applications.

# 36" X 60" TYPE 2 WALK THROUGH – ENTER/EXIT EITHER SIDE

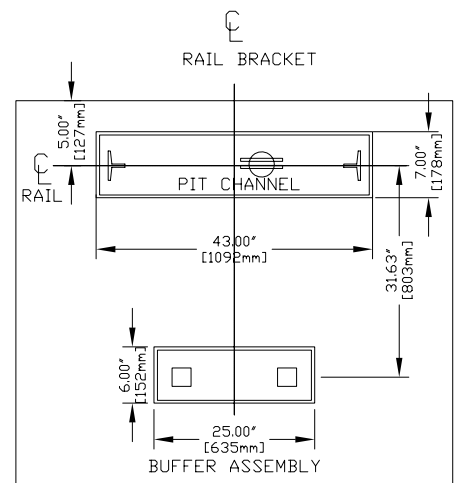
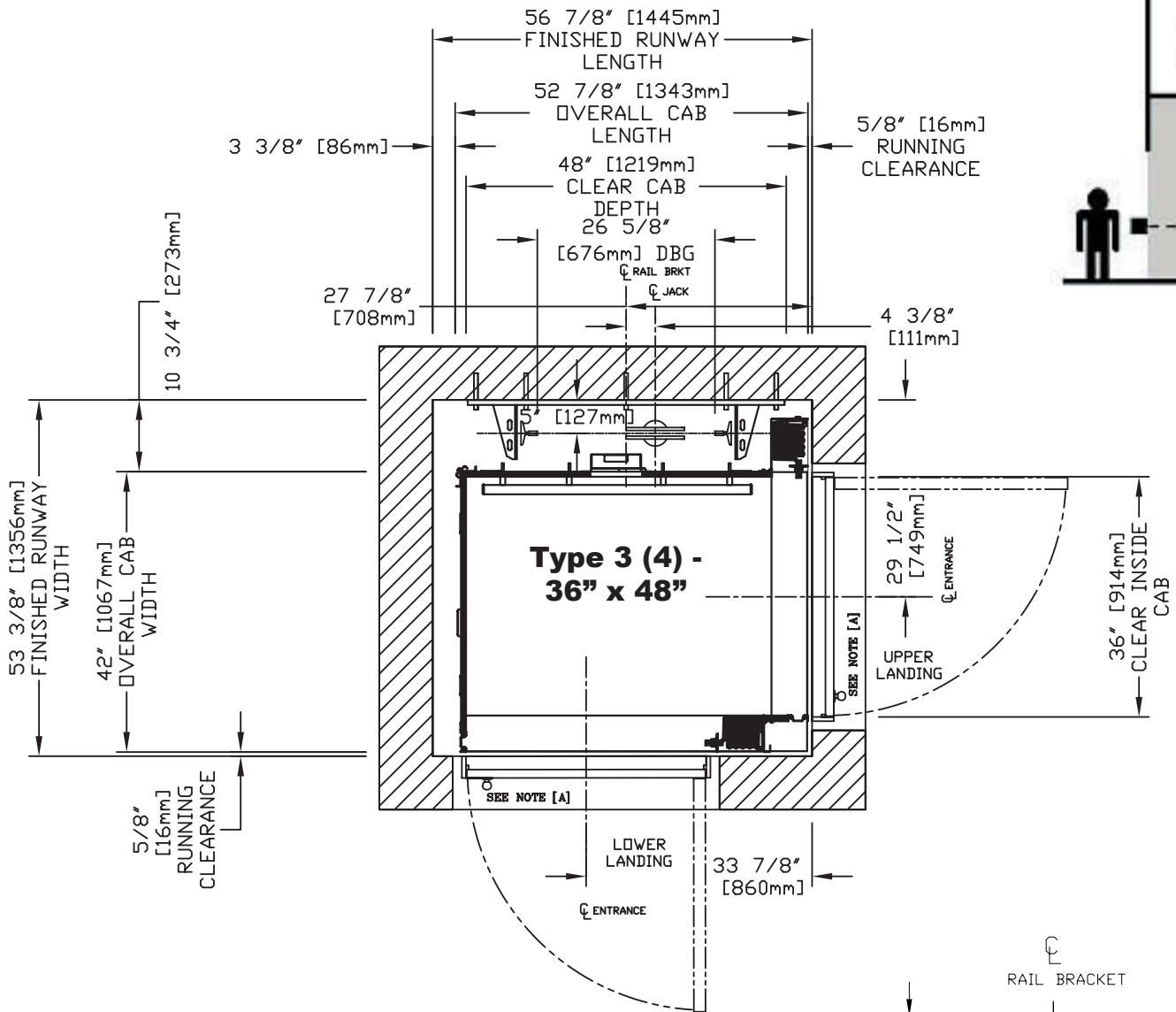
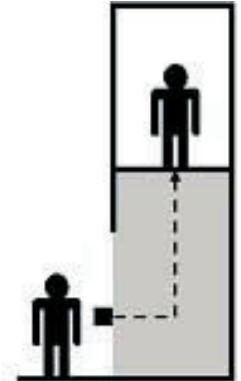


**NOTE**

Plan view drawing can be reversed for Right Hand applications.

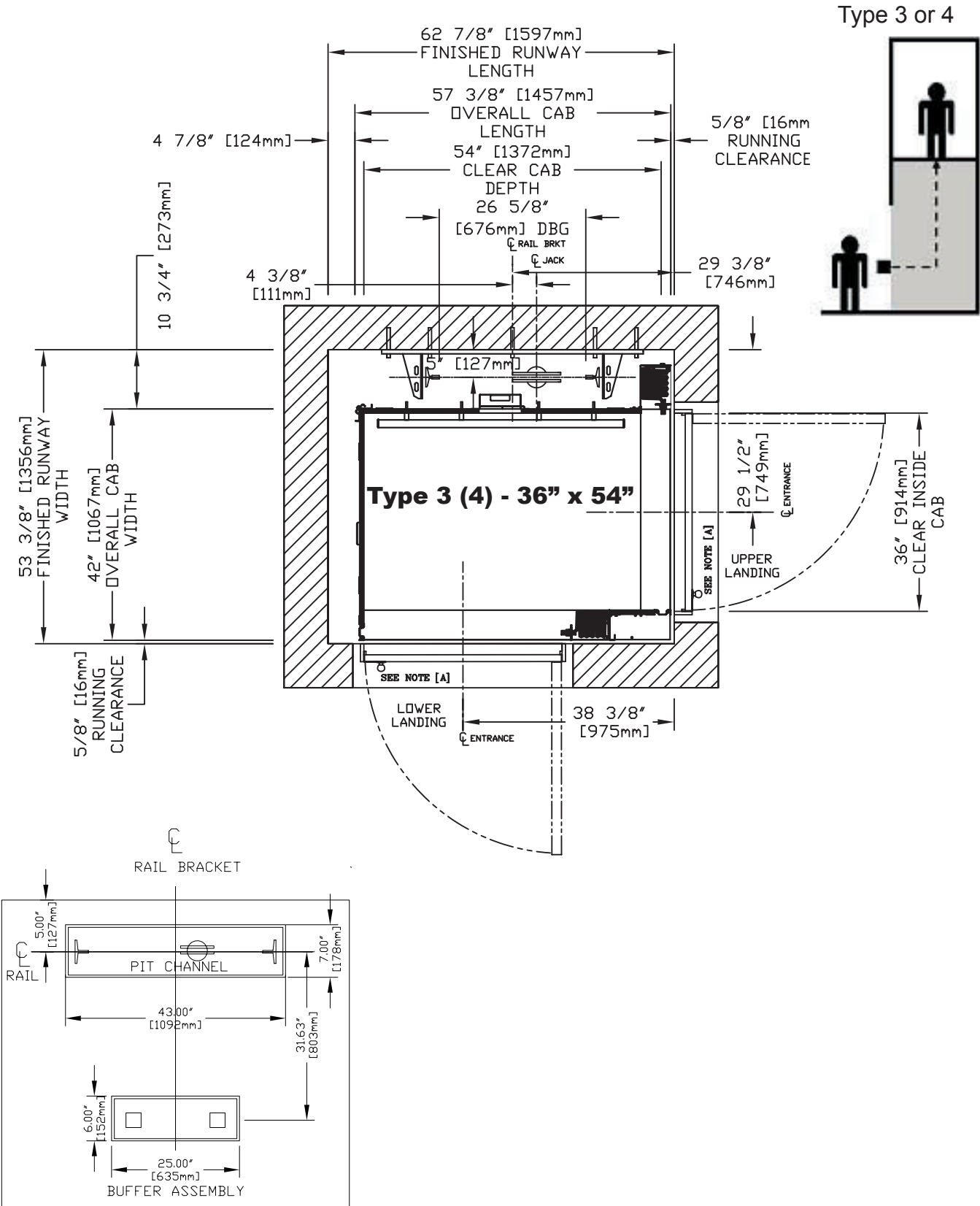
# 36" X 48" TYPE 3 OR 4 - ENTER/EXIT FRONT OR SIDE

Type 3 or 4



**NOTE**  
 Plan view drawing can be reversed for Type 4 applications.

# 36" X 54" TYPE 3 OR 4 - ENTER/EXIT FRONT OR SIDE

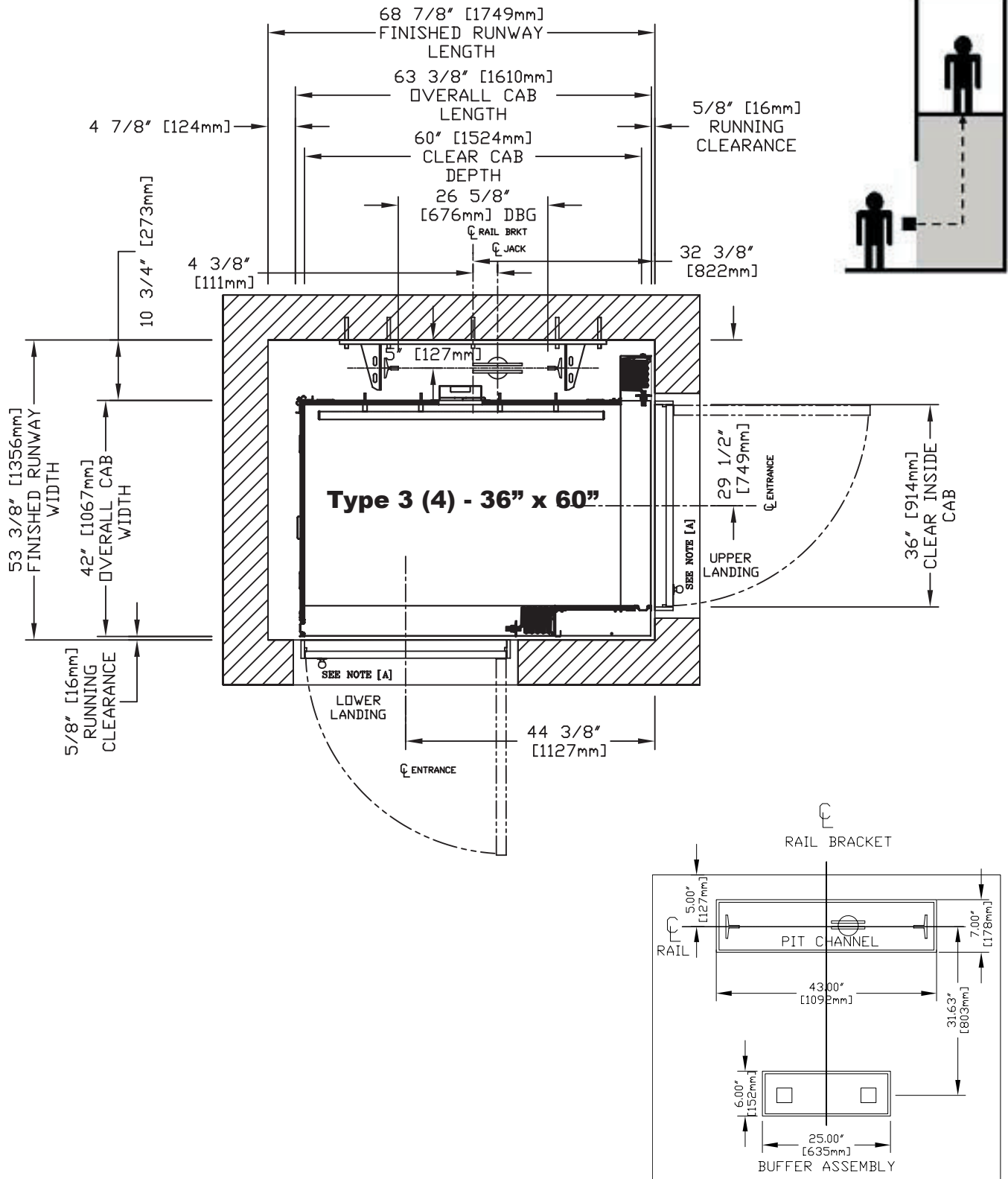


## NOTE

Plan view drawing can be reversed for Type 4 applications.

# 36" X 60" TYPE 3 OR 4 - ENTER/EXIT FRONT OR SIDE

Type 3 or 4

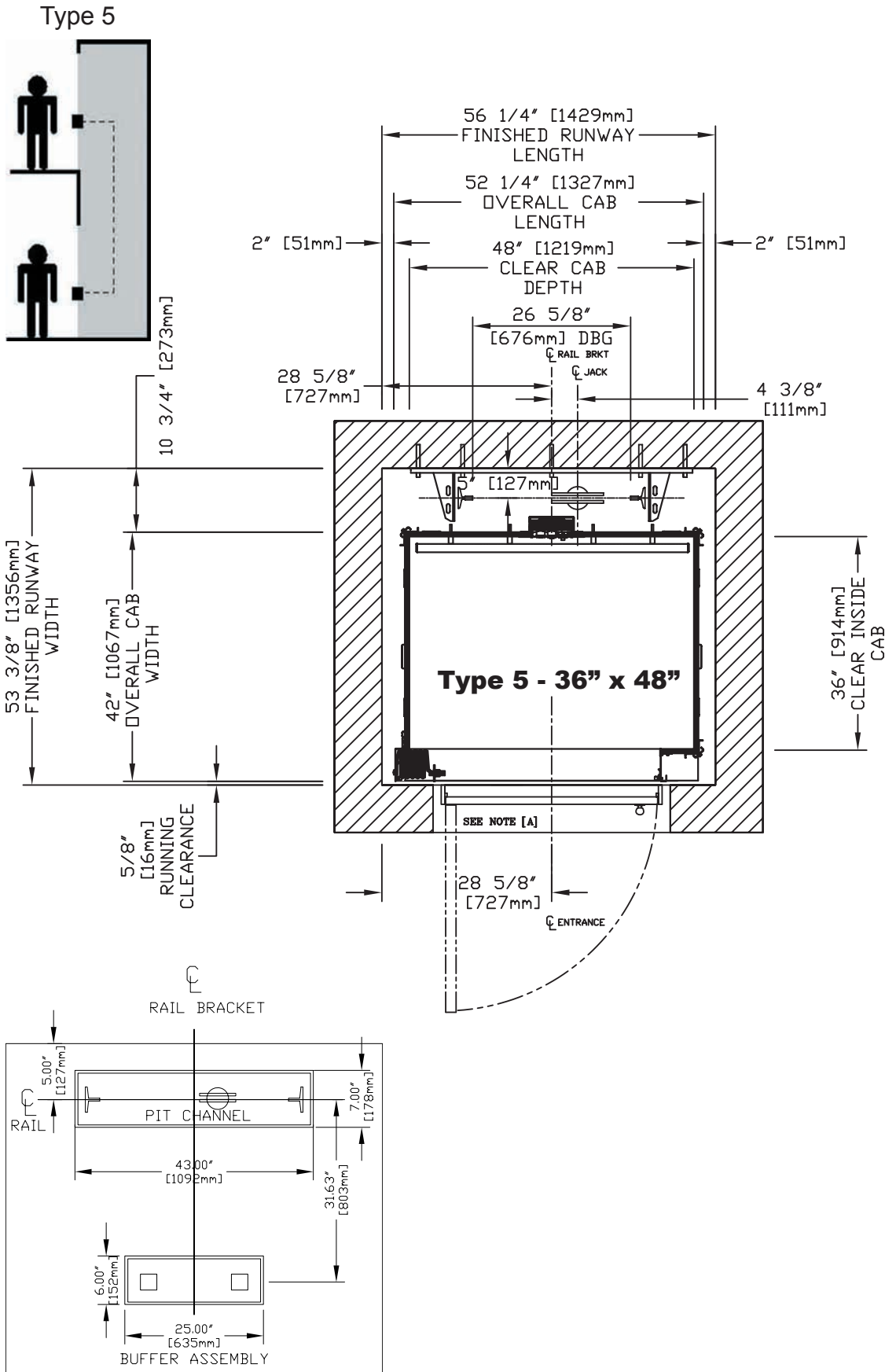


## NOTE

Plan view drawing can be reversed for Type 4 applications.

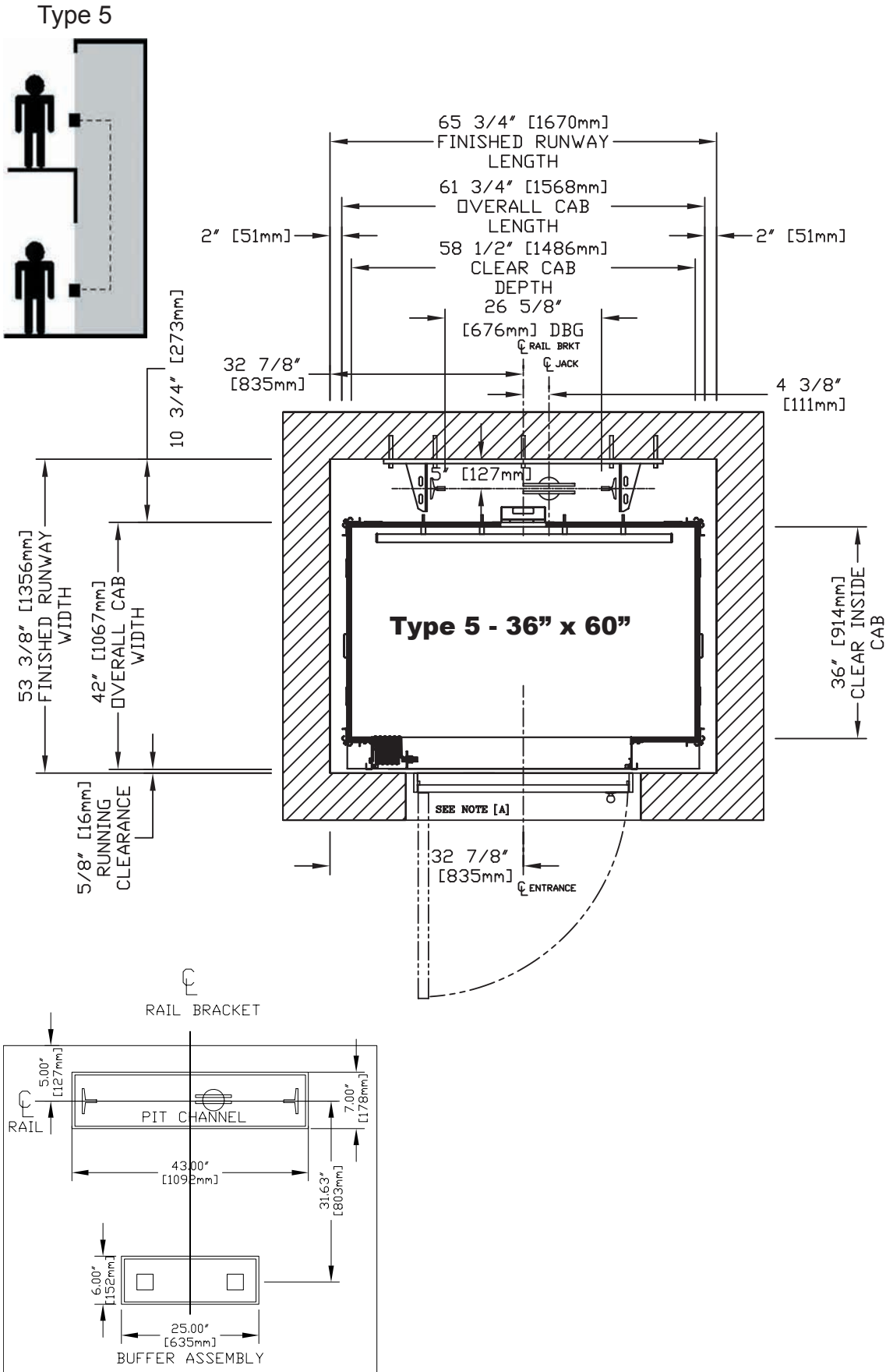


# 36" X 48" TYPE 5 - ENTER/EXIT SAME SIDE

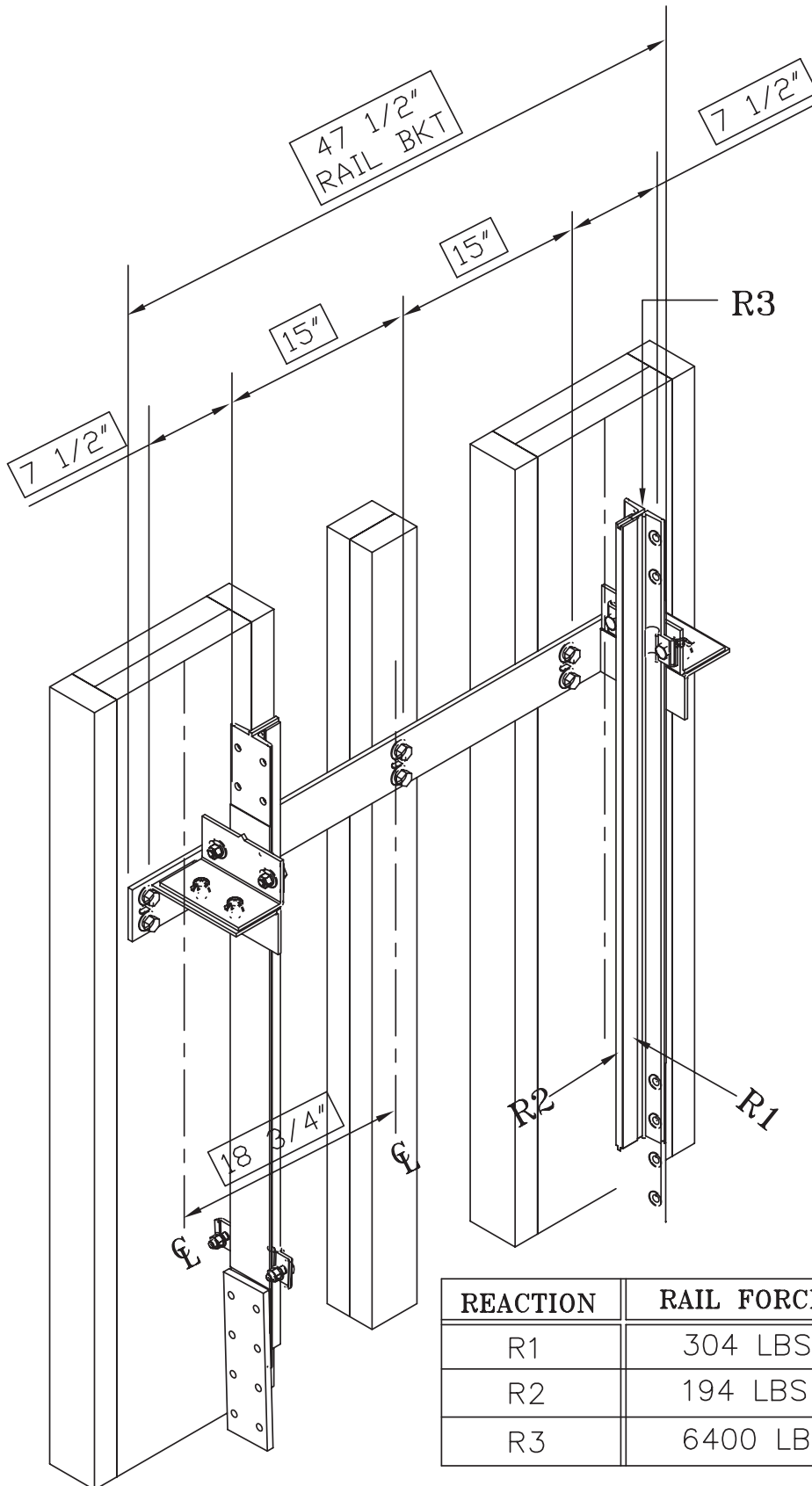




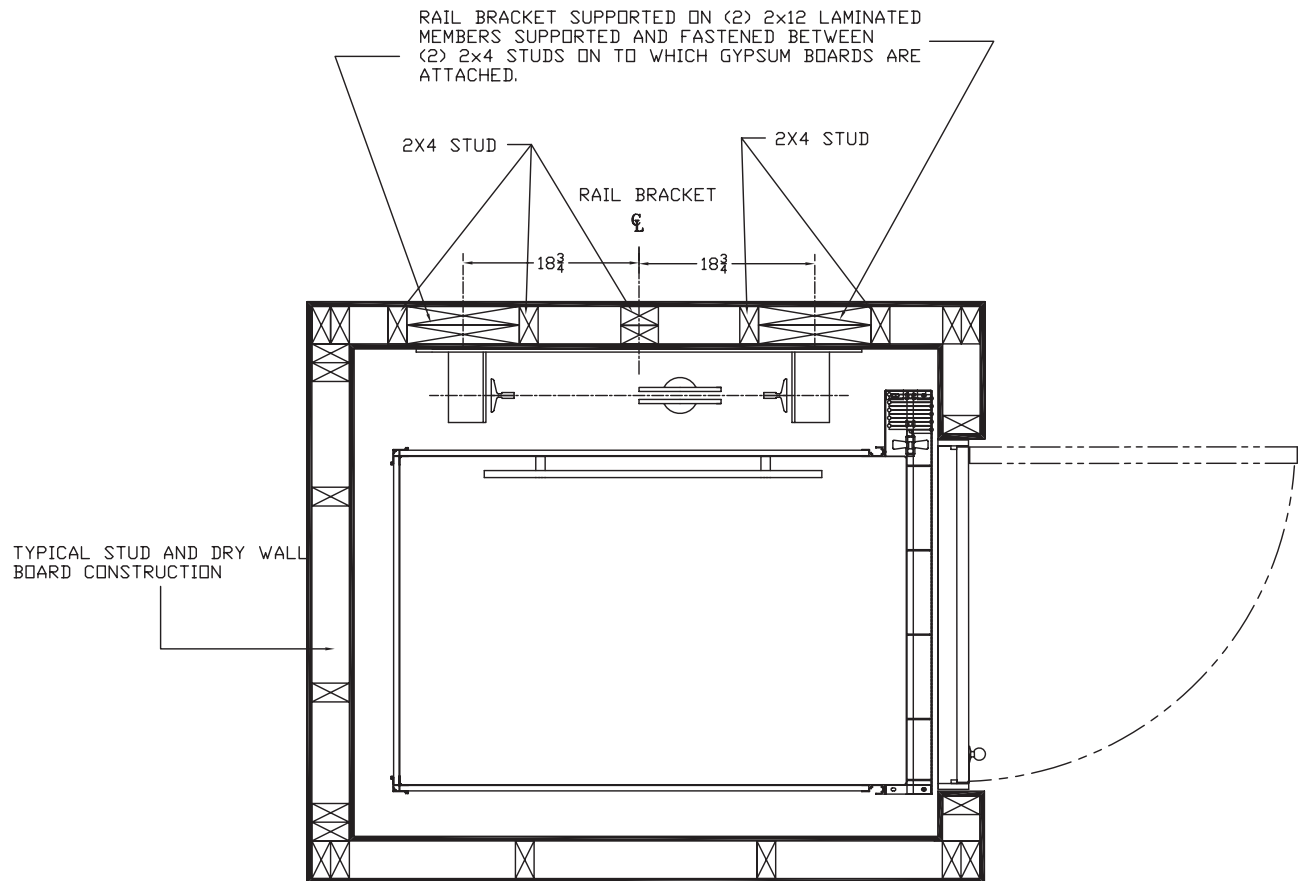
# 36" X 60" TYPE 5 - ENTER/EXIT SAME SIDE



# Suggested Wall Configuration for Wood Construction



# Suggested Wall Configuration for Wood Construction



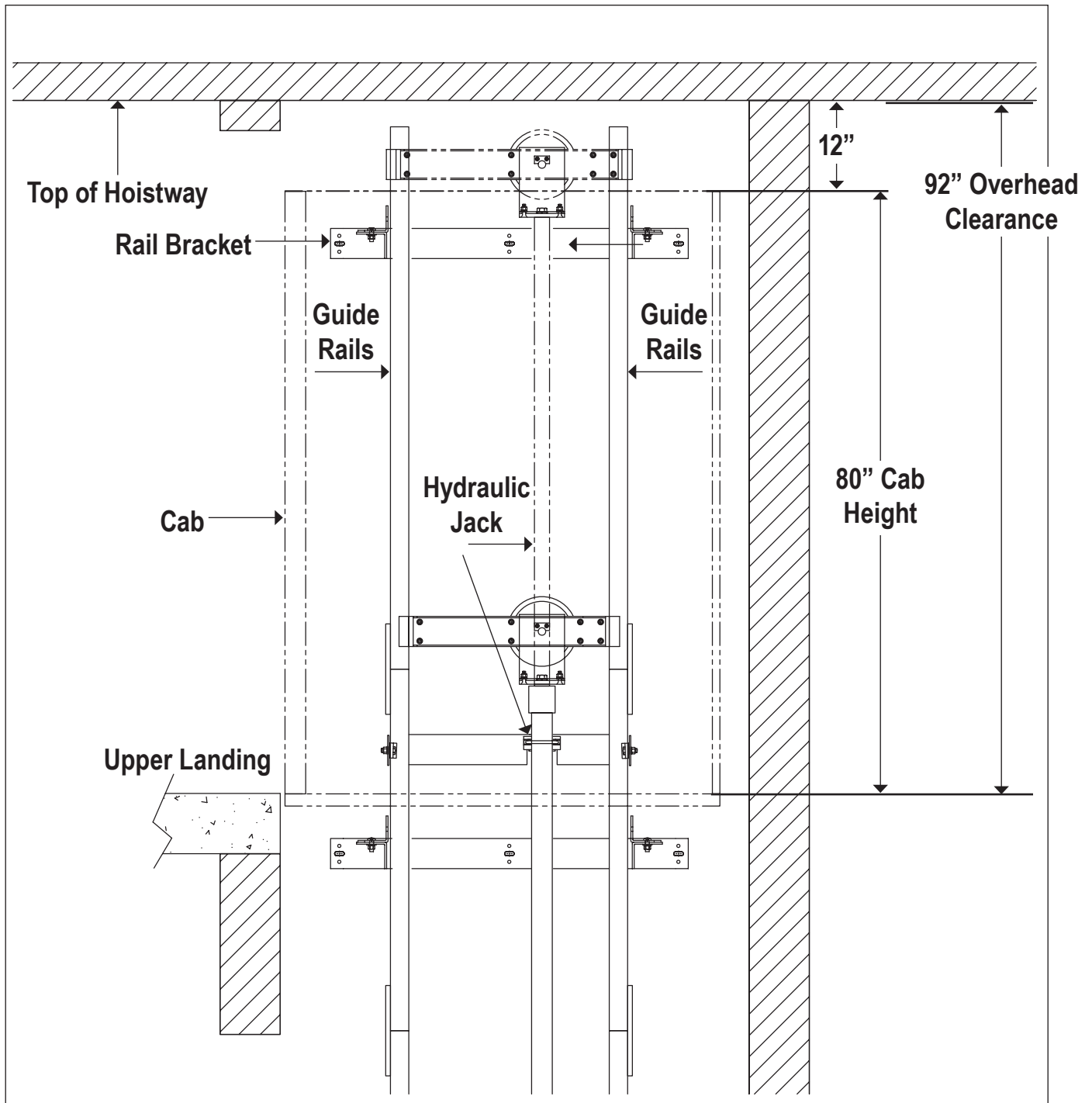
**NOTE:**

1. THIS DRAWING IS FOR REFERENCE ONLY. BUILDING STRUCTURAL ENGINEER TO ENSURE THAT THE BUILDING AND HOISTWAY WILL SAFELY SUPPORT ALL LOADS IMPOSED BY THE LIFT EQUIPMENT
2. FIRE RATING OF HOISTWAY IS SUBJECT TO LOCAL BUILDING CODES.

## IMPORTANT

These drawings are for reference purposes only. The building structural engineer must ensure that the building and hoisway will support all loads imposed by the lift equipment. Fire rating of hoistway is subject to local building codes.

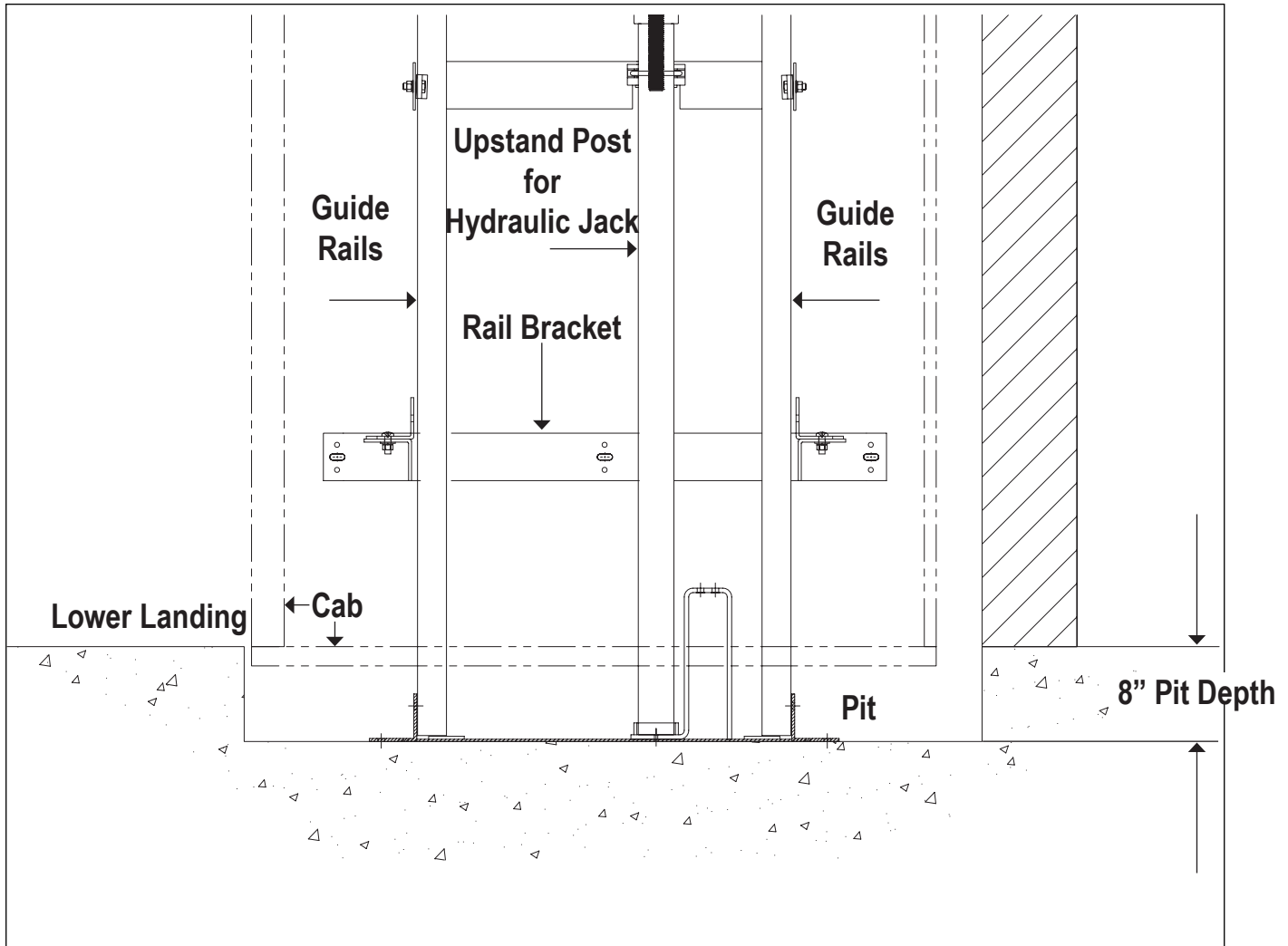
# Overhead Clearance Details



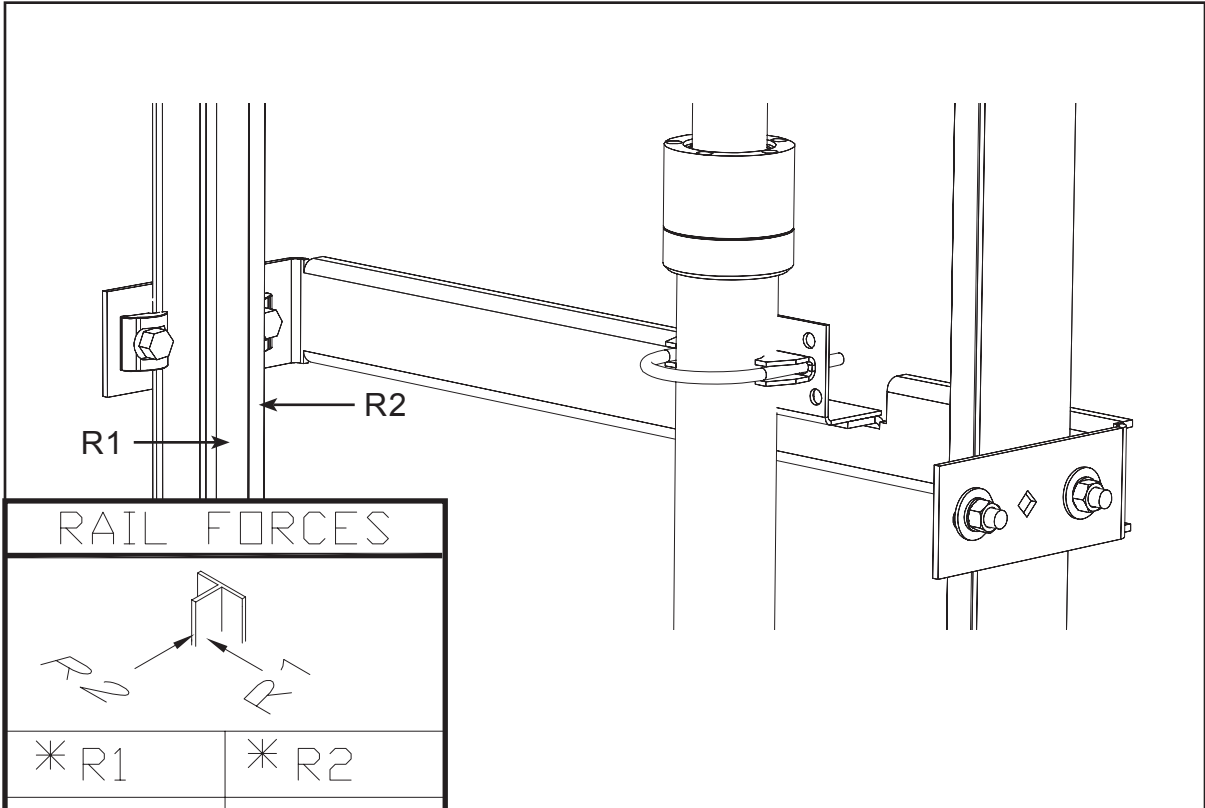
## NOTE

The above dimensions are for an 80" high cab, the minimum overhead clearance for an 96" high cab is 108" (2743 mm).

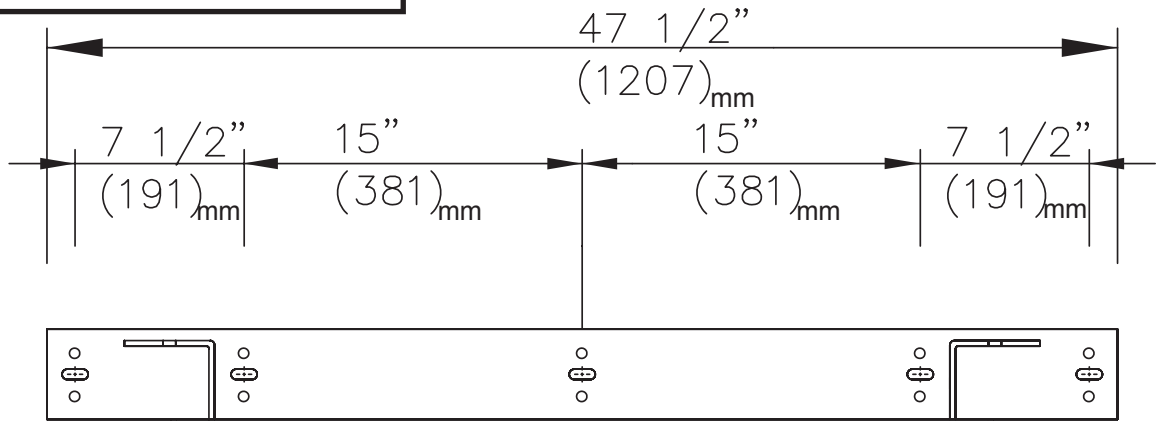
# Pit Details



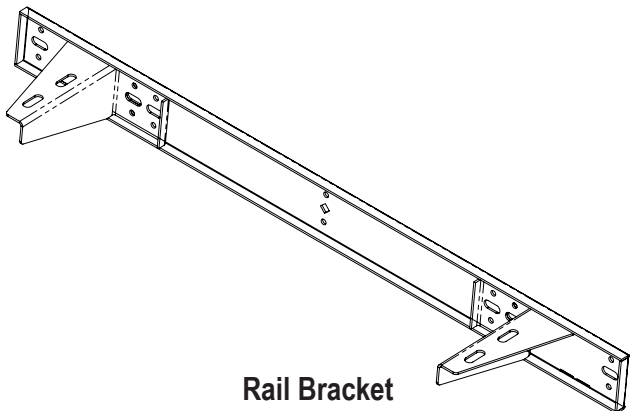
# Loads on Building



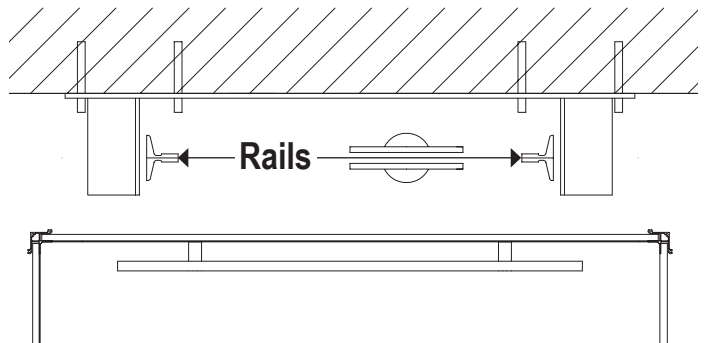
RAIL FORCES	
* R1	* R2
304 lbf	194 lbf
RAIL WEIGHT : 8.0 lbs / ft	



**Rail Bracket Dimensions**



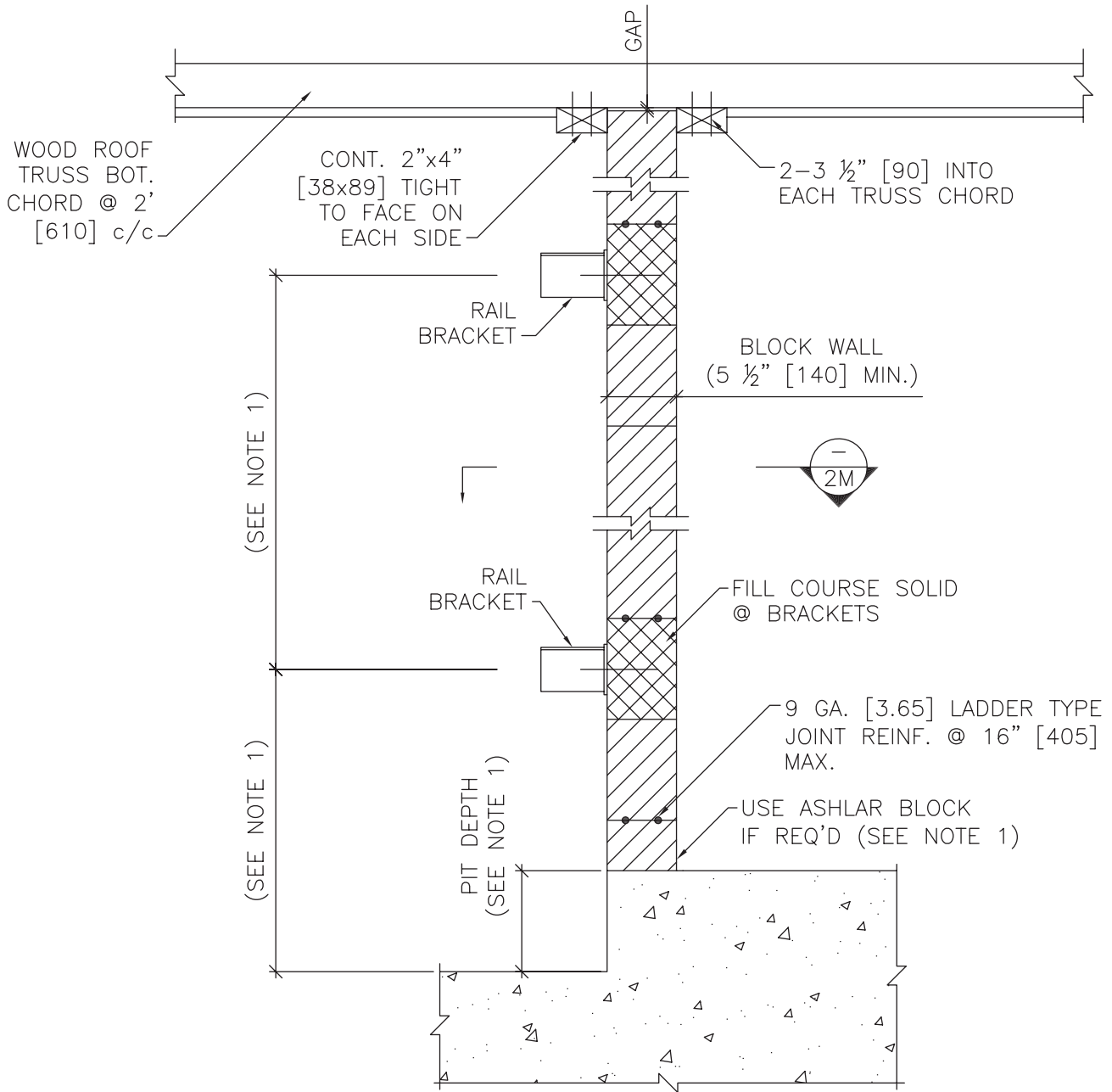
**Rail Bracket**



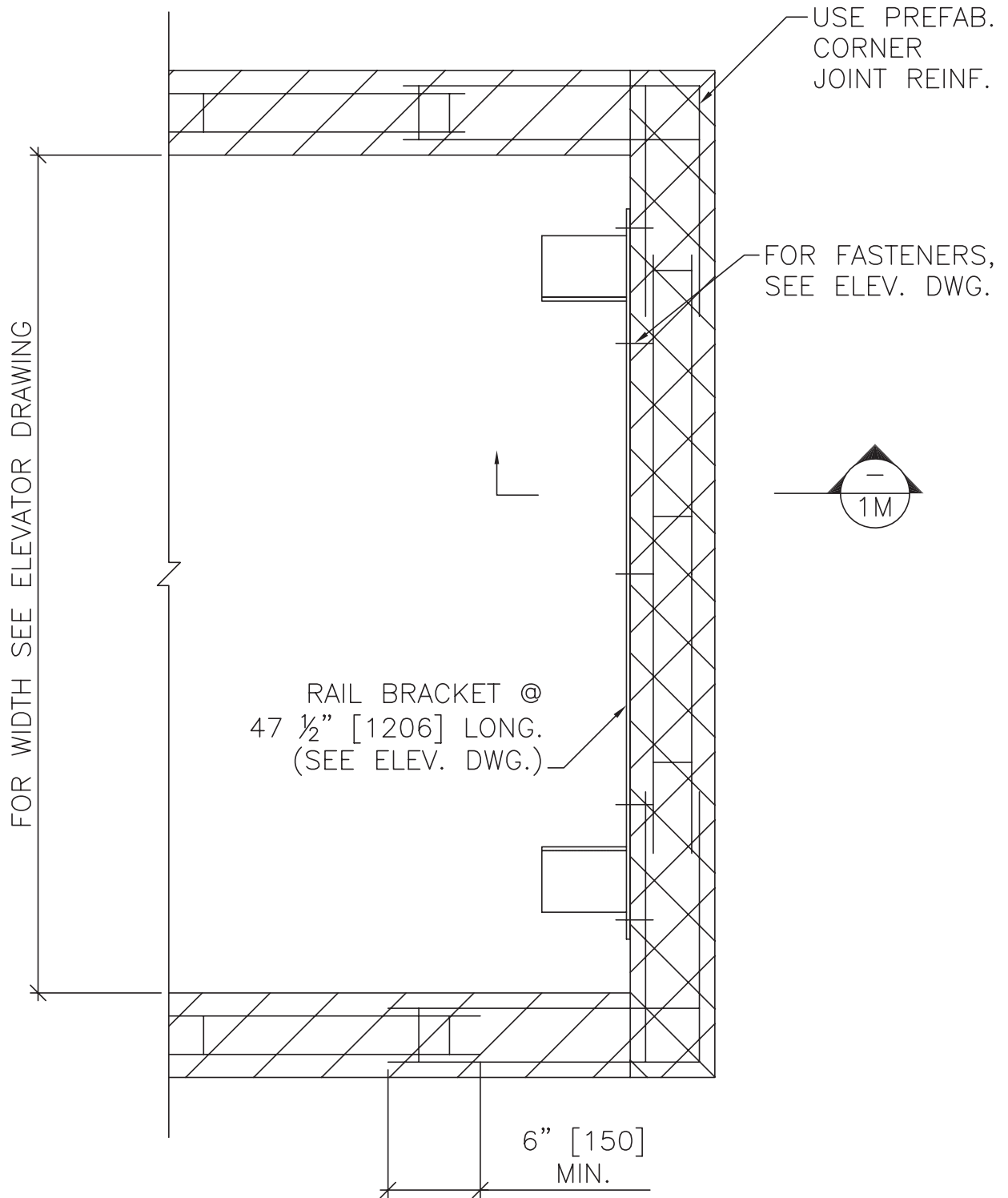
**Support Wall Rail Orientation**



# Masonry Construction - Sectional View



# Masonry Construction - Plan View



# Rail Support Wall Specifications

## Drawing Notes

- 1) See Lift Drawing for rail bracket spacing and pit depth.
- 2) Wall lateral support spacing:
  - for 2" x 4" studs, use 6 ft 10" (2090 mm) max.
  - for 2" x 6" studs, use 13 ft 6" (4120 mm) max.
- 3) Sheathing installation: install sheets vertically full width of shaft or min. centred on rail brackets.
- 4) Connectors to resist horizontal load but allow vertical movement.  
For Wood, use 2" x ¼" cap screw lag bolts.

## General Specifications

- G1 The design and construction of all work is to conform to the local applicable building code.
- G2 Read these drawings in conjunction with all related architectural, mechanical, electrical, and lift drawings as well as any other contract documents.
- G3 The wall drawings have been prepared using engineering principles and the design loads that are applied by the lift rails to the wall. However, the details and member sizes and the attachments to the structure should not be construed as a complete design of the wall system. The contractor and/or the project engineer is responsible to evaluate the other loads that are applied to the wall from the floor or roof system and modify member sizes or connections as required by their analysis.
- G4 Do not scale the drawings.
- G5 See lift shop drawings for service loads (including dynamic effects) which are:  
horizontal load parallel to the wall = 194 lb.  
horizontal load perpendicular to the wall = 304 lb.
- G6 Wood:               SPF NO 1/2 Mix  
Concrete:           3000 psi (20 Mpa) @ 28 days. If exposed use 5% to 7% air content.  
Anchor Bolts:      ASTM A307  
Mortar:             Type "S"  
Masonry Grout:    2100 psi (14 Mpa) High Slump  
Masonry Block:   2100 psi (14 Mpa) on net area
- G7 Wall to be installed plumb and square within 1/8" (3 mm) of top and bottom of shaft.
- G8 Wall lateral support spacing (H) selected for maximum horizontal deflection of H/360 from rail loads.

## Wood Construction

- W1 Separate wood from concrete with waterproof barrier or use pressure treated wood.
- W2 Bridging Maximum Spacing: Load Bearing or Shear walls – 4 ft c/c
- W3 Nail or screw sheathing at 6" c/c at edges and 12" c/c to other members.  
Use 2.5" Standard Ardox nails or 2" #12 Screws.

## Masonry Construction

- M1 All masonry construction to conform to applicable local standards
- M2 Reinforce lintel blocks with 2 m-15 m bottom bars unless noted.
- M3 Provide continuous ladder type joint reinforcement at 16" (400) c/c.

# Infinity Standard Notes

## HOISTWAY

- The hoistway must be designed and built in accordance with “safety code for elevators and escalators” (ASME A17.1 - 2000 Part 5, Section 5.3) and all state and local codes.
- Due to close running clearances owner/agent must ensure that hoistway and pit (where provided) are level, plumb and square and are in accordance with the dimensions on these drawings.

## MINIMUM OVERHEAD CLEARANCE

- Owner/agent must ensure minimum overhead clearance is in compliance with codes.

## CONSTRUCTION SITE

- Owner/agent to provide all masonry, carpentry and drywall work as required and shall patch and make good (including finish painting) all areas where walls/floors may require to be cut, drilled or altered in any way to permit the proper installation of the lift.

## DIMENSIONS

- Contractor/customer to verify all dimensions and report any discrepancies to our office immediately.

## STRUCTURAL

- Structural engineer to assure that building and shaft will safely support all loads imposed by the lift equipment. Refer to the tables on installation drawings for loads imposed by the equipment.
- Suitable lintels must be provided by owner/agent. Door frames are not designed to support overhead wall loads.

## ELECTRICAL

- Power supply with a lockable fused disconnect and auxiliary contact to brake the battery feed, or circuit breakers with a 3-pole breaker for battery feed required in compliance with electrical code

Disconnect Switch Types & Accessories	Cutler Hammer	Federal Pioneer	Siemens
<b>1 PHASE 3 H.P. Pump Unit</b>			
2 Pole Solid Neutral 208 or 230V 1 PH	1HD221N	1322SN	ID321
Required Auxiliary Contact	DS16CP	E1K-1AEV-W94	MSSAK 116
Required Type “D” Fuse (Buss type “FRN” or equal)	2@20 amp	2@20 amp	2@20 amp
<b>3 PHASE 3 H.P. Pump Unit</b>			
3 Pole Solid Neutral 208V 3 PH	1HD321N	1332SN	ID321
Required Auxiliary Contact	DS16CP	E1K-1AEV-W94	MSSAK 116
Required Type “D” Fuse (Buss type “FRN” or equal)	3@15 amp	3@15 amp	3@15 amp
<b>Cab Lighting</b>			
1 Pole Solid Neutral 120V 1 PH	GP 111N	86211	CFN 211
Required Type “D” Fuse (Buss type “T” or equal)	1@15 amp	1@15 amp	1@15 amp

- Permanent power of 230V 1ph 30 amp or 208 Volt, 3ph, 30 amp must be supplied by others before installation.
- Remote hall call (when supplied) to be installed by the owner/agent at 42” from landing floor and 8” from the door frame edge.

## ENTRANCES

- Entrance assemblies must be adjusted to align with platform and interlock equipment. Others to allow an adequate rough opening.
- Entrance assembly must be securely fastened to walls by elevator contractor.

# Specifications for Part 5.3 Compliance

## PART 1 - GENERAL

### SCOPE

To furnish all labor, materials and equipment necessary or required to fully complete the installation of the commercial wheelchair platform lift as indicated on the Drawings and Specifications. This suggested specification is intended to cover the complete installation of the FREEDOM 750 Residential Elevator.

### SYSTEM DESCRIPTION

The lift assembly shall consist of a power unit, car, guide system, 1:2 cable hydraulic lifting device, control system, signals and alarms, electrical wiring, and parts and accessories necessary to provide required performance, operation, code and safety requirements.

#### 1.3.1 QUALITY ASSURANCE

The lift shall meet or exceed the applicable regulations of all governing agencies and be in conformance with the applicable sections of the most current edition of the following codes and standards:

- a) ASME A17.1 "Safety Code for Elevators and Escalators; "Private Residence Elevators". CAN/CSA B44 Part 5 Section 5.3
- b) ICC/ANSI A117.1-1998 "Accessible and Usable Buildings and Facilities".
- c) NFPA 70-1999 "The National Electric Code" (NEC).
- d) ADAAG "Americans With Disabilities Act Accessibility Guidelines" (where applicable).
- e) CSA B44.1/ASME A17.5 "Elevator and Escalator Electrical Equipment"
- f) Local codes and regulations, as applicable.

#### 1.3.2 REQUIREMENTS OF THE REGULATORY AGENCIES

- a) Fabricate and install work in compliance with all applicable jurisdictional authorities.
- b) File shop drawings and submissions to local authorities as the information is made available. Company pre-inspection and jurisdictional authority inspections and permits are to be made on a timely basis as required. Work will include all inspections and re-inspections that are required to ensure licenses are issued.

#### 1.3.3 SUBCONTRACTOR QUALIFICATIONS

- a) Execute work of this specification only by a contractor/company who has adequate product and public liability insurance in excess of one million dollars.
- b) Skilled tradesmen must be employees of the contractor and perform the work on a timely basis. Employees must be trained by the manufacturer and be supervised by the lift contractor.

#### 1.3.4 SUBSTITUTIONS

No substitutions will be considered unless written request for approval has been submitted by the bidder and received by the architect at least 10 days before the receipt of bids. Each such request shall include a complete description of the proposed substitute including drawings, test data, photographs, and any other information needed for consideration.

## PART 2- PREPARATORY WORK BY OTHERS

### 2.1

The following preparatory work to accommodate/receive the lift is to be done by others.

#### 2.1.1

Provide power unit machine room to meet applicable Codes and Standards.

#### 2.1.2

Permanent power (230 Volt, Single Phase, 30 Amp or 208 Volt, 3 Phase, 30 Amp) to operate the lift to be provided to a Lockable Fused/Cartridge Type Disconnect Switch with auxiliary contact/switch for emergency battery lowering. Refer to architectural drawings for permanent power specifications and location of disconnects.

#### 2.1.3

Provide 115 volt lighting supply and disconnect. Refer to architectural drawings for permanent power specifications and location of disconnects.

#### 2.1.4

Provide an enclosed, plumb and square hoistway with smooth interior surfaces. Include for fascias or furring of hoistway interior where applicable.

#### 2.1.5

Provide fire doors, frames, and door hardware.  
Provide rough openings as per lift contractor's drawings.

#### 2.1.6

Provide substantial, level pit floor slab to support loads indicated on lift contractor's shop drawings.

#### 2.1.7

Provide adequate support for guide rail fastenings.

#### 2.1.8

Provide pit water proofing to maintain a dry pit. Sump pump where required by authority having jurisdiction. (see lift contractor for location).

#### 2.1.9

Provide 8" (203 mm) minimum pit.

#### 2.1.10

Provide 92" (2337 mm) or 108" (2743 mm) minimum overhead (distance from floor at upper level to underside of roof).

## PART 3 – SUBMITTALS

### 3.1 SHOP DRAWINGS (presentation)

The shop drawings shall show a complete layout of the lift equipment detailing dimensions, clearances and location of machinery. Including the following:

- a) Drawings show the dimensions including plans, elevations, and sections to show equipment locations.
- b) Load and reaction drawings shall be provided by the lift manufacturer and detailed on drawings.

## PART 4 – PRODUCT DATA

### 4.1 PRODUCT

The lift shall be the FREEDOM 750 Residential Elevator  
Nationwide Lifts, Inc.  
Phone: 888-323-8755  
Fax: 877-825-6001  
www.nwlifts.com

Rated Load: (specify) 750 lbs (340 kg) or 1000 lbs (454 kg)  
Nominal Speed: 36 fpm (0.18 mps)  
Car Dimensions: (specify) 36" W X 48" D x 80" H or  
36" W X 54" D x 80" H or 36" W x 60" D x 80" H  
Operation: Automatic  
Power Supply:(specify) 230 Volt, 1 Phase, 30 Amps or 208 Volt, 3  
Phase, 30 Amps  
Travel Distance: (specify) 50 ft. (15.24 m) max \_\_\_\_\_  
Levels Served: (specify) up to 5 \_\_\_\_\_  
Number of Cab Openings: Two (2) Maximum  
Lighting Supply: 115 Volt, 1 Phase, 60 Cycle, 15 Amps  
Jack Type: 1:2 Cable Hydraulic  
Pump Type: Submersible with Variable Speed Valve  
Leveling Device Type: Magnetic Floor Scanner

### 4.2 CAR ENCLOSURE

#### 4.2.1 WALLS

½" (13 mm) Melamine or MDF panels and anodized aluminum cab  
entrance trim.

#### 4.2.2 CEILINGS

White with four (4) recessed incandescent down lights.

#### 4.2.3 FLOOR

Plywood sub-flooring.

#### 4.2.4 HANDRAIL

Aluminum handrail located on control panel side of cab.

#### 4.2.5 EMERGENCY OPERATION

The lift car shall be equipped with a battery-powered emergency  
lowering device and alarm that can be actuated on the failure of  
normal building power supply. Battery will be rechargeable type with  
an automatic recharging system.

#### 4.2.6 EMERGENCY LIGHT

The car shall be equipped with an integral emergency light that will  
illuminate automatically in the event of a main power failure.

#### 4.2.7 CAR OPERATING PANEL

Car operating panel shall consist of metal push buttons with halo  
lighting for each landing, an emergency stop button, an alarm button  
and a key switch. The key is removable in both the on and off position.  
All mounted on an anodized aluminum panel.

#### 4.2.8 DIGITAL FLOOR INDICATOR

Optional Digital Floor Indicator located in the control panel will display  
the location and direction of travel (floor number) of the lift in the  
shaft.

#### 4.2.9 CAR LIGHTING

The car lighting shall consist of four (4) low voltage recessed  
incandescent down lights. The failure of one lamp shall not cause the  
remaining lamp to extinguish.

#### 4.2.10 AUTOMATIC LIGHTS

Overhead lights in the car compartment shall turn ON automatically  
when the lift door is opened and will stay on while the lift is in use. The  
lift lights will shut off by a timer when the lift is not in use.

### 4.3 PLATFORM TOE GUARD

A platform toe guard shall be provided at each car entrance opening  
to extend below the car entrance opening for safety.

### 4.4 DOOR LOCKS

Locks shall be electrically operated and electrically released at  
floor level and will remain unlocked until hall or car call is placed.  
When released, the locks' lag member will drop down and close the  
electrical circuitry to ensure the elevator cannot move unless the  
door is closed and locked (a true interlock).

### 4.5 HALL CALL STATIONS

Provide a keyless hall call station with an illuminated call button and  
stainless steel cover plate for each landing.

### 4.6 LEVELING DEVICE

- a) The lift shall be provided with a 2-way leveling device, which  
will maintain the car within ½" (13 mm) of the landing.
- b) Levelling device sensors shall be located in a position to be  
inaccessible to unauthorized persons.

### 4.7 CAR GATE REQUIRED OPTION

Horizontally collapsible accordion style panel fold car gate with three  
(3) clear acrylic vision panels shall enclose each car entrance.

### 4.8 HYDRAULIC POWER UNIT

- a) The pump and motor shall be the submersible type installed  
inside the oil tank.
- b) The controller shall be integrally mounted on the power unit  
frame and pre-wired and tested before shipment.
- c) Control circuitry to be located at the top of the oil tank.
- d) The power unit control valve shall be a variable speed  
proportional valve type that includes all hydraulic control  
valving inherently.

This valve shall incorporate the following features:

- (i) Up and down acceleration and deceleration speed  
adjustment for smooth starts and stops.
- (ii) Smooth stops at each landing shall be an inherent  
feature of the valve.
- (iii) Adjustable pressure relief valve.
- (iv) Manually operating 'DOWN' valve to lower lift in an  
emergency.
- (v) Pressure gauge indicating in P.S.I. and Bars.
- (vi) Gate valve to isolate cylinder from pump unit.
- (vii) Negative pressure switch.

### 4.9 CYLINDER AND PLUNGER

#### 4.9.1

The cylinder shall be constructed of steel pipe of a sufficient thickness  
and suitable safety margin. The top of the cylinder shall be equipped  
with a cylinder head with an internal guide ring and self-adjusting  
packing.

#### 4.9.2

The plunger shall be constructed of a steel shaft of a proper diameter  
machined true and smooth. The plunger shall be provided with a stop  
electrically welded to the bottom to prevent the plunger from leaving  
the cylinder.

### 4.10 CABLE

Minimum of two ⅜" (10 mm) IWRC Galvanized Aircraft Cables.  
Minimum breaking strength of 14,400 lbs. each.

#### 4.11 SAFETY DEVICE

A "slack/broken cable" safety device shall be supplied which will stop and sustain the lift and its rated load, if either of the hoisting cables become slack or breaks. The safety device shall be resettable by the operation of the lift in the upward direction. A switch shall be mounted in such a position as to sense the operation of the safety device, and will open the safety circuit to the controller to prevent operation of the lift in either direction.

#### 4.12 GUIDE YOKE

The 1:2 guide yoke/sheave arrangement shall be supplied with a sheave, guide shoes, roller bearings and adjustable cable guards. The sheave shall be finished with rounded grooves to fit the cables.

#### 4.13 FINAL LIMIT SWITCH

The lift shall be equipped with a final limit switch to cut off all power to the lift if the upper normal terminal stopping devices fail.

#### 4.14 GUIDE RAILS AND BRACKETS

- a) Steel 8lb/ft "T" guide rails and brackets shall be securely fastened to the building structure.
- b) Brackets shall securely hold the guides in a plumb and true position regardless of car loading.
- c) Guides shall be bolted through the hoistway enclosure with back-up plates, washers and nuts. Subject to architects' alterations and approval.

#### 4.15 CAR SLING

- a) Car sling shall be fabricated from steel members with adequate bracing to support the platform and cab.
- b) The buffer-striking member on the underside of the car must stop the lift before the jack plunger reaches its down limit of travel.
- c) Guide shoes to be solid slipper type with polyurethane inserts.

#### 4.16 WIRING

All wiring and electrical connections shall comply with applicable codes, insulated wiring shall have flame retardant and moisture proof outer covering and shall be run in conduit or electrical wireways. Traveling cables shall be flexible and suitably suspended to relieve strain.

### **Part 5 - EXECUTION**

#### 5.1 EXAMINATION

All site dimensions shall be taken to ensure that tolerances and clearances have been maintained and meet local regulations.

#### 5.2 PREPARATION

Pre-inspect the construction and service requirements for "Work by Others". These requirements will be included in drawings, diagrams, engineering data sheets and special instructions before the work commences.