



Freedom Hydro

Residential Elevator Planning Guide

5/22/2015

ASME A17.1 Code Compliant

Introduction

The Freedom Hydro provides a smooth, quiet ride. The pump unit and controller must be located in a machine room. Placing this machine room in a lower level or remote location will reduce any noise. The elevator has many cab, gate, and fixture options available.

Unique Options

- Sliding doors: 2-speed solid sliding gate is a remarkable upgrade over the traditional accordion gate. Sliding landing doors are also available for complete luxury.
- Pitless: Ideal for remodeling projects, this elevator can be configured to work without a pit.
- Larger size/capacity: Where allowed, the Freedom Hydro can be upgraded to 1400lb capacity and 18 sq ft of floor space.
- Wider cabs: The heavy-duty frame allows for cabs up to 48" wide, where most residential elevators are limited to 36" wide.

The following pages will cover important information for planning an installation of the Freedom Hydro.

- **Specifications**
- **Cab Configurations and Hoistway sizing**
- **Hoistway Blocking**
- **3-5 Rule**
- **2-Speed Landing Door Preparation**
- **Electrical Preparation**
- **Site Preparation Checklist**

Specifications

Code Compliance:	ASME A17.1 Section 5.3 (Residential Elevators)
Load Capacity:	1000 lbs
Rated Speed:	40 fpm
Power Supply (by others):	230V, 1PH, 60Hz, 30A
Lighting Supply (by others):	120V, 60Hz, 15A
Drive System:	Automatic 3HP submersible pump
Temperature Range:	-10 to + 40 degrees C, 14 to 104 degrees F
Maximum Travel:	50 ft
Control System:	PLC with error log and troubleshooting indicators
Levels:	Up to 5 stops
Openings:	Up to 3 openings
Pit Depth:	Cab with accordion gate: 6" minimum, 8" recommended Cab with 2-speed gate: 8" minimum, 12" recommended
Minimum Overhead:	92" for standard 80" cab with accordion gate 108" for 96" cab with accordion gate 96" for cab with 78" 2-speed gate 102" for cab with 84" 2-speed gate 117" for cab with 94" 2-speed gate
Cab Sizes:	36" wide x 48" deep 36" wide x 54" deep 36" wide x 60" deep 40" wide x 48" deep 40" wide x 54" deep 44" wide x 48" deep Custom sizes up to 15 sq ft
Cab Lighting:	Automatic LED Lighting
Cab Phone:	Hands-free, recessed in wall

Safety Features:	<ul style="list-style-type: none"> Cab emergency stop switch Cab gate switch Pit stop switch Car top stop switch Battery backup lowering Battery backup lighting Upper and lower final limit switches Safety brakes Slack cable switch Shoring pins for service Auxiliary safety circuit for service Emergency manual lowering
Hall Station / COP Finish:	<ul style="list-style-type: none"> Stainless steel Brass Bronze
Cab Panel Options:	<ul style="list-style-type: none"> Melamine (oak, maple, cherry, white) Hardwood veneer (oak, maple, cherry, walnut, mahogany) Recessed hardwood veneer (oak, maple, cherry, walnut, mahogany) Raised hardwood (oak, maple, cherry, walnut, mahogany) Stainless steel walls Glass walls
Cab Gate Options:	<ul style="list-style-type: none"> Accordion gate (vinyl, clear, or metallic) manual or automatic 2-speed sliding gate (stainless steel, primed steel, or glass) 3-speed sliding gate (stainless steel, primed steel, or glass)
Landing Doors:	<ul style="list-style-type: none"> Swing doors by others (EMI interlocks provided with elevator) 2-speed sliding door (stainless steel, primed steel, or glass) 3-speed sliding door (stainless steel, primed steel, or glass) Fire-rated 2-speed sliding doors (stainless steel, primed steel, or glass)
Additional Options:	<ul style="list-style-type: none"> Custom cab heights Custom cab finishes Custom cab flooring Touch screen car operating panel Keypad lock (need PIN to run to a level) Integration with home automation Keyed call stations Upgraded accordion gates Automatic accordion gate operator Automatic swing door operator Veneer wrap on 2-speed doors

Cab Configurations and Hoistway Sizing

This section will assist the reader with properly sizing the hoistway and cab. Before moving forward, please read and understand the following key points.

Finished Dimensions: All dimensions are finished dimensions, after sheet rock has been installed.

Capacity: ASME A17.1 code limits the size of the cab floor to 15 sq ft and 1000 capacity. In some regions, the platform is permitted to be larger. The Freedom Hydro can be upgraded to 18 sq ft and 1400 lb capacity. Consult with your local representative before planning for a 1400 lb capacity configuration. Note: 1400 lb capacity requires a 12" pit.

Center of Rail: The 'Center of Rail' measurement is included in the tables due to its importance. The rails are not always centered on the rail wall, depending on the configuration. The reinforcement blocking that is built into the rail wall is positioned off the center of the rails. This 'Center of Rail' measurement will be needed when installing the blocking.

Center of Door: The doors are not centered on the hoistway. The rails take up a substantial amount of room, shifting the cab off center. This means that the doors are shifted off center to line up with the cab. It is critical that the centerline of the door matches the dimensions in the drawings.

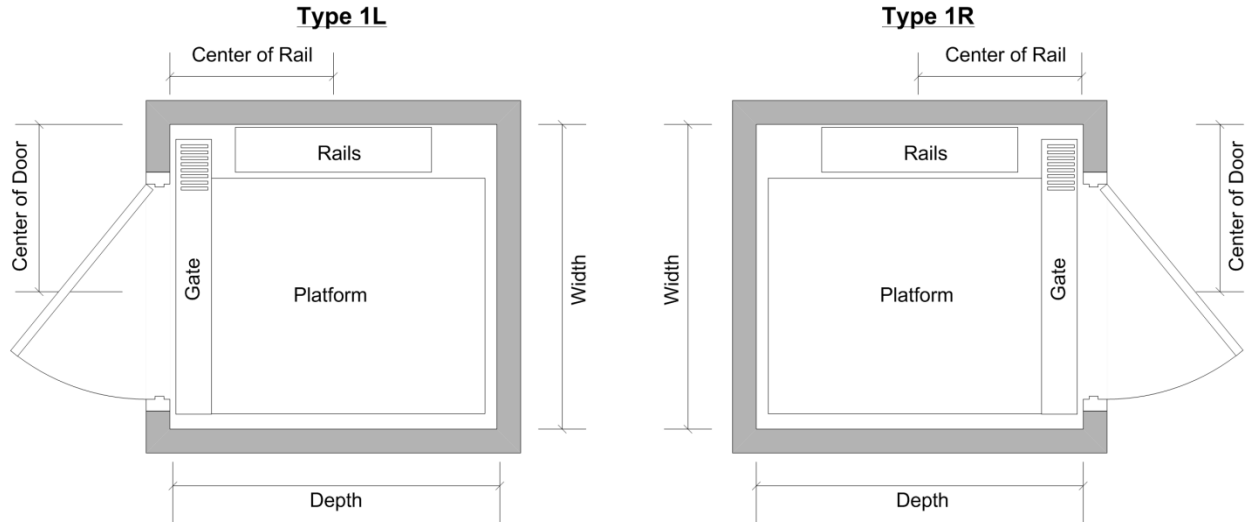
Accordion Gate: The accordion gate is the most common type of gate used in residential elevators. It folds up into a pocket to the side of the door opening. The accordion gate is shown in each of the following diagrams.

2-Speed Gate: A 2-speed gate is an upgraded replacement for the accordion gate. This is made of 2 solid panels that slide into the same pocket. The panel furthest from the pocket travels twice as fast as the one closest to the pocket, so they reach the pocket at the same time. This kind of gate is typically seen in commercial elevators. The 2-speed sliding gate does not need to be matched up with sliding doors on the landings. In residential applications, there may be swing doors on the landings. When we refer to 2-Speed Gate, this will mean just the gate slides, and the landing doors swing.

2-Speed Gate/Landings: This is what you would find in commercial applications. The gate on the cab opens in synch with the sliding doors on the landings. This is an excellent upgrade for a residential elevator and popular in high end homes. Be aware that this adds a fair amount of space requirement to the hoistway. The landing doors hang inside the hoistway, requiring more space.

Door Swings: The diagrams on the following pages show the most common door swing for each configuration. Your project is not limited to the swing shown in these sample diagrams. Communicate your door swing requirements to your local rep and this will be added to your custom drawings. When describing the door swing, we call it LH (left-handed) or RH (right-handed). When standing outside the elevator, looking at the door, the handle is on the left side if it is a LH swing. The handle is on the right side if it is a RH swing. Looking at diagram 1L, this shows a RH swing. Diagram 1R shows a LH swing.

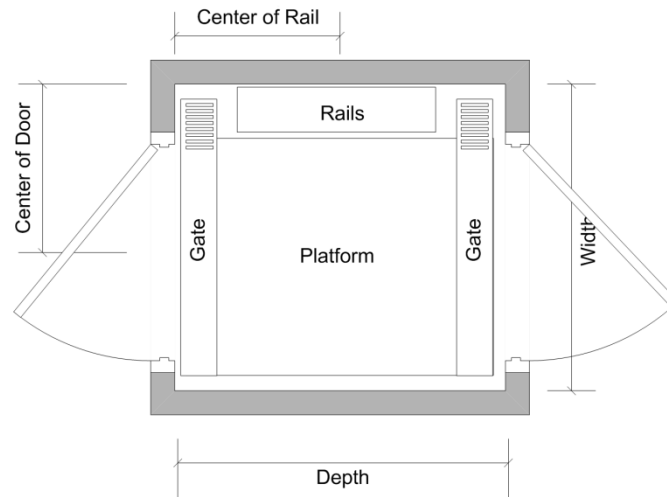
OH: OH is the abbreviation for overhead distance. This is the measurement from the floor level of the top landing to the ceiling of the hoistway. The OH varies depending on the configuration and the height of the cab.



	<u>Capacity</u>	<u>Width</u>	<u>Depth</u>	<u>Center Rail</u>	<u>Center Door</u>	<u>OH 80" Cab</u>	<u>OH 84" Cab</u>	<u>OH 96" Cab</u>	<u>OH Pitless 80" Cab</u>
Accordion Gate									
36x48	1000	50"	55"	29"	28"	96"	100"	112"	110"
36x54	1000	50"	61"	32"	28"	96"	100"	112"	N/A
36x60	1000	50"	67"	35"	28"	96"	100"	112"	N/A
40x48	1000	54"	55"	29"	32"	96"	100"	112"	N/A
40x54	1000	54"	61"	32"	32"	96"	100"	112"	N/A
40x60	1400	54"	67"	35"	32"	96"	100"	112"	N/A
44x48	1000	58"	55"	29"	36"	96"	100"	112"	N/A
44x54	1400	58"	61"	32"	36"	96"	100"	112"	N/A
48x54	1400	62"	61"	32"	40"	96"	100"	112"	N/A
2-Speed Gate									
40x48	1000	62"	58"	32"	40"	96"	104"	116"	N/A
40x54	1000	62"	64"	35"	40"	96"	104"	116"	N/A
40x60	1400	62"	70"	38"	40"	96"	104"	116"	N/A
44x48	1000	62"	58"	32"	40"	96"	104"	116"	N/A
44x54	1400	62"	64"	35"	40"	96"	104"	116"	N/A
48x54	1400	62"	64"	35"	40"	96"	104"	116"	N/A
2-Speed Gate/Landings									
40x48	1000	64"	62"	35"	40"	96"	104"	116"	N/A
40x54	1000	64"	68"	38"	40"	96"	104"	116"	N/A
40x60	1400	64"	74"	41"	40"	96"	104"	116"	N/A
44x48	1000	64"	62"	35"	40"	96"	104"	116"	N/A
44x54	1400	64"	68"	38"	40"	96"	104"	116"	N/A
48x54	1400	64"	68"	38"	40"	96"	104"	116"	N/A

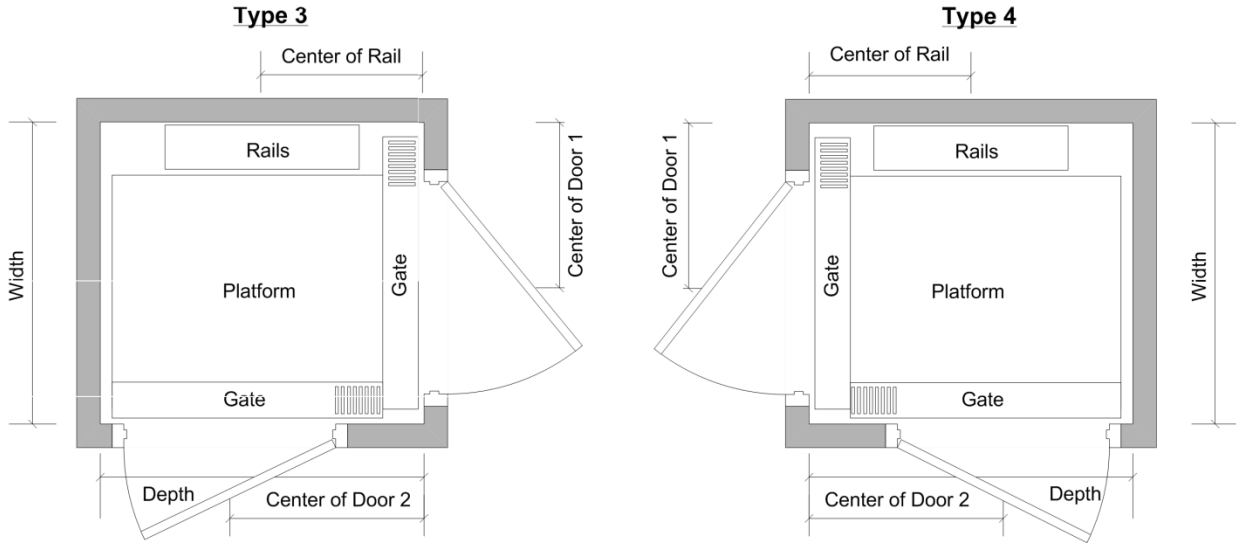
* All dimensions are finished dimensions after sheet rock

Type 2



	<u>Capacity</u>	<u>Width</u>	<u>Depth</u>	<u>Center Rail</u>	<u>Center Door</u>	<u>OH 80" Cab</u>	<u>OH 84" Cab</u>	<u>OH 96" Cab</u>	<u>OH Pitless 80" Cab</u>
Accordion Gate									
36x48	1000	50"	56"	28"	28"	96"	100"	112"	110"
36x54	1000	50"	62"	31"	28"	96"	100"	112"	N/A
36x60	1000	50"	68"	34"	28"	96"	100"	112"	N/A
40x48	1000	54"	56"	28"	32"	96"	100"	112"	N/A
40x54	1000	54"	62"	31"	32"	96"	100"	112"	N/A
40x60	1400	54"	68"	34"	32"	96"	100"	112"	N/A
44x48	1000	58"	56"	28"	36"	96"	100"	112"	N/A
44x54	1400	58"	62"	31"	36"	96"	100"	112"	N/A
48x54	1400	62"	62"	31"	40"	96"	100"	112"	N/A
2-Speed Gate									
40x48	1000	62"	60"	30"	40"	96"	104"	116"	N/A
40x54	1000	62"	66"	33"	40"	96"	104"	116"	N/A
40x60	1400	62"	72"	36"	40"	96"	104"	116"	N/A
44x48	1000	62"	60"	30"	40"	96"	104"	116"	N/A
44x54	1400	62"	66"	33"	40"	96"	104"	116"	N/A
48x54	1400	62"	66"	33"	40"	96"	104"	116"	N/A
2-Speed Gate/Landings									
40x48	1000	64"	68"	34"	40"	96"	104"	116"	N/A
40x54	1000	64"	75"	37"	40"	96"	104"	116"	N/A
40x60	1400	64"	80"	40"	40"	96"	104"	116"	N/A
44x48	1000	64"	68"	34"	40"	96"	104"	116"	N/A
44x54	1400	64"	75"	37"	40"	96"	104"	116"	N/A
48x54	1400	64"	75"	37"	40"	96"	104"	116"	N/A

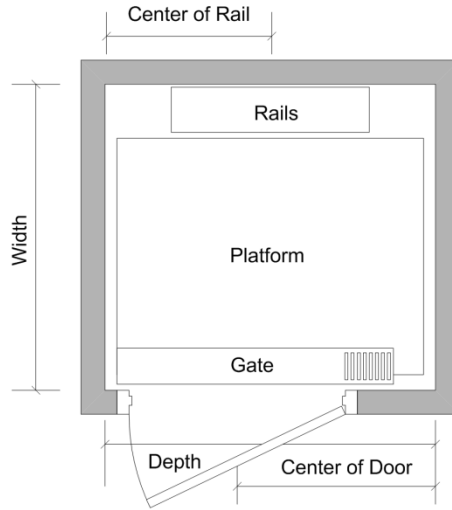
* All dimensions are finished dimensions after sheet rock



	Capacity	Width	Depth	Center Rail	Center Door1	Center Door2	OH 80" Cab	OH 84" Cab	OH 96" Cab	OH Pitless
Accordion Gate										
36x48	1000	52"	55"	29"	28"	34"	96"	100"	112"	N/A
36x54	1000	52"	61"	32"	28"	40"	96"	100"	112"	N/A
36x60	1000	52"	67"	35"	28"	46"	96"	100"	112"	N/A
40x48	1000	56"	55"	29"	32"	34"	96"	100"	112"	N/A
40x54	1000	56"	61"	32"	32"	40"	96"	100"	112"	N/A
40x60	1400	56"	67"	35"	32"	46"	96"	100"	112"	N/A
44x48	1000	60"	55"	29"	36"	34"	96"	100"	112"	N/A
44x54	1400	60"	61"	32"	36"	40"	96"	100"	112"	N/A
48x54	1400	64"	61"	32"	40"	40"	96"	100"	112"	N/A
2-Speed Gate										
40x48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40x60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44x48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-Speed Gate/Landings										
40x48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40x60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44x48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
44x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48x54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* All dimensions are finished dimensions after sheet rock

Type 5



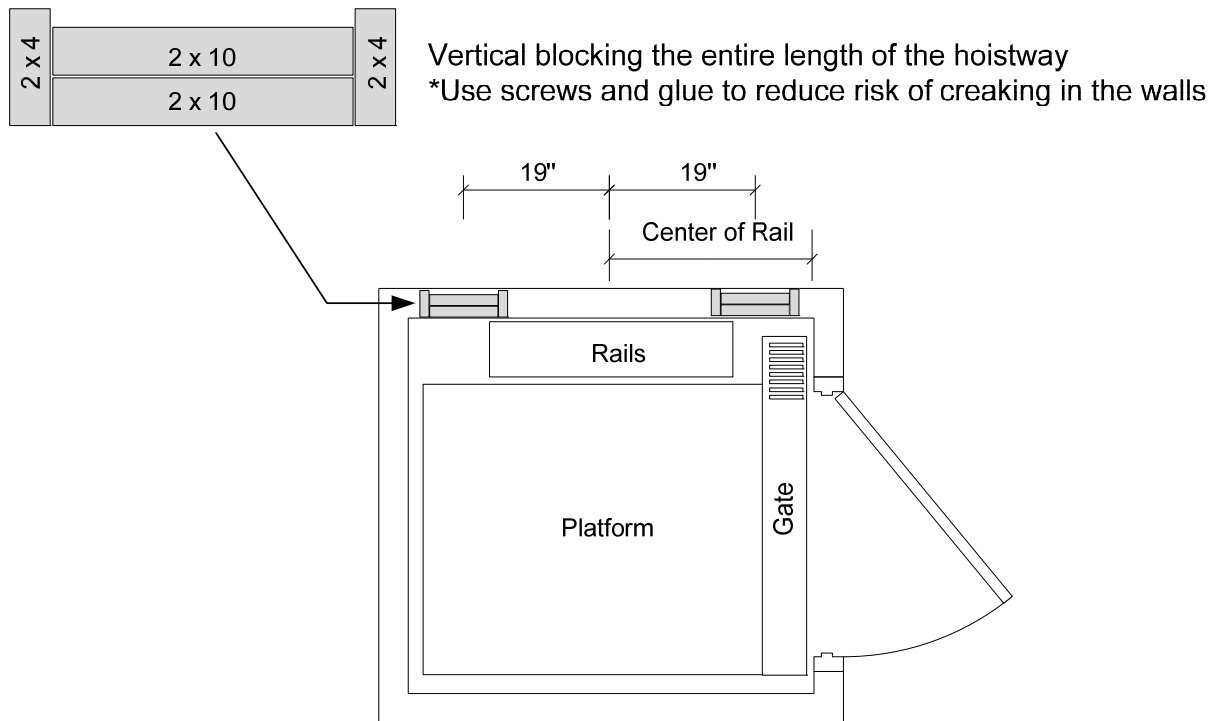
	<u>Capacity</u>	<u>Width</u>	<u>Depth</u>	<u>Center Rail</u>	<u>Center Door</u>	<u>OH 80" Cab</u>	<u>OH 84" Cab</u>	<u>OH 96" Cab</u>	<u>OH Pitless</u>
Accordion Gate									
36x48	1000	52"	56"	28"	35"	96"	100"	112"	N/A
36x54	1000	52"	62"	31"	41"	96"	100"	112"	N/A
36x60	1000	52"	68"	34"	47"	96"	100"	112"	N/A
40x48	1000	56"	56"	28"	35"	96"	100"	112"	N/A
40x54	1000	56"	62"	31"	41"	96"	100"	112"	N/A
40x60	1400	56"	68"	34"	47"	96"	100"	112"	N/A
44x48	1000	60"	56"	28"	35"	96"	100"	112"	N/A
44x54	1400	60"	62"	31"	41"	96"	100"	112"	N/A
48x54	1400	64"	62"	31"	41"	96"	100"	112"	N/A
2-Speed Gate									
40x48	1000	58"	62"	31"	40"	96"	104"	116"	N/A
40x54	1000	58"	62"	31"	40"	96"	104"	116"	N/A
40x60	1400	58"	68"	34"	46"	96"	104"	116"	N/A
44x48	1000	62"	62"	31"	40"	96"	104"	116"	N/A
44x54	1400	62"	62"	31"	40"	96"	104"	116"	N/A
48x54	1400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-Speed Gate/Landings									
40x48	1000	62"	64"	32"	40"	96"	104"	116"	N/A
40x54	1000	62"	64"	32"	40"	96"	104"	116"	N/A
40x60	1400	62"	68"	34"	44"	96"	104"	116"	N/A
44x48	1000	66"	64"	32"	40"	96"	104"	116"	N/A
44x54	1400	66"	64"	32"	40"	96"	104"	116"	N/A
48x54	1400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* All dimensions are finished dimensions after sheet rock

Hoistway Blocking

The rail system needs structural support from the hoistway wall. At various points along the rail wall, the rail brackets will be lagged into the wall. We recommend vertical blocking the entire height of the hoistway to provide suitable support.

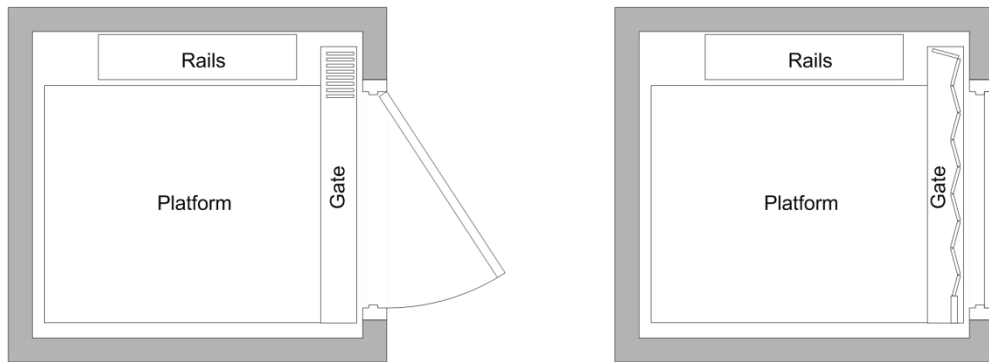
Two columns of vertical blocking are needed. First find the 'Center of Rails'. The centerline for each vertical blocking column will be 19" on each side of the 'Center of Rails'. The vertical blocking should consist of 2 2x10 planks screwed together and capped with 2x4 planks. We recommend using screws and glue to prevent creaking in the wall. The diagram below shows the placement of the vertical blocking.



3 - 5 Rule

The 3-5 Rule relates to residential elevators with swing doors on the landings. The space between the back of the swing door and the cab gate is very dangerous. The code requires that the distance from the back of the swing door to the edge of the hoistway cannot exceed 3", and the back of the swing door to the cab gate cannot exceed 5".

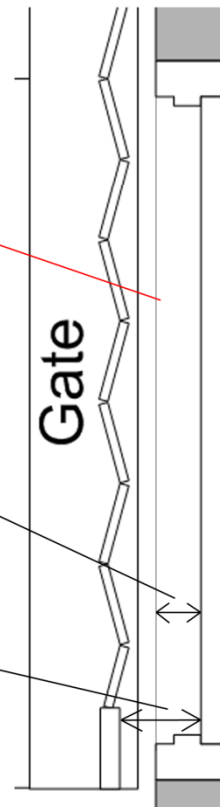
The contractor building the hoistway is responsible for meeting the 3" requirement. **This rule will be enforced. Take this into consideration when framing the hoistway.** We recommend framing the hoistway doors with 2x4 construction will help to meet the 3-5 rule. Framing the hoistway doors with 2x6 construction will make it difficult to meet the 3-5 rule.



The area between the door and the gate is very dangerous. This space must be kept to a minimum.

Back of door to sill not to exceed 3"

Back of door to gate not to exceed 5"



2-Speed Landing Door Preparation



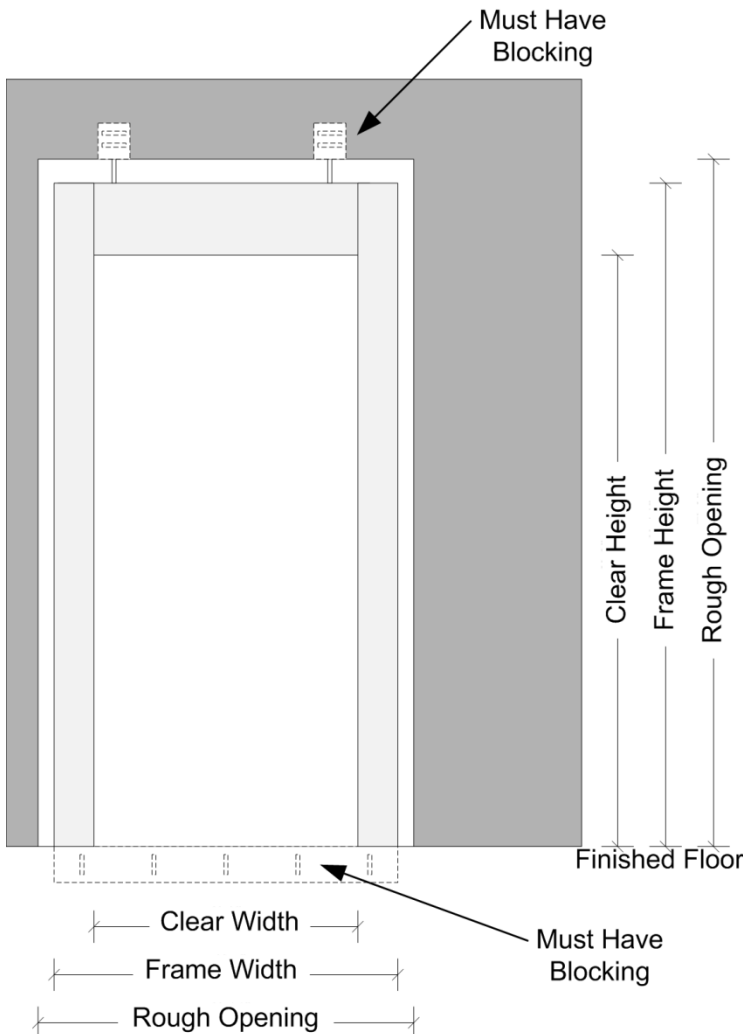
Note: All heights measured from finished floor.

Note: Substantial blocking must be available in header and below floor.

78" Doors (non-fire-rated)

Clear Height:	78 ¾"
Frame Height:	87 ¾"
Minimum Rough Opening:	88"
Preferred Rough Opening:	90"

Clear Width:	35 ½"
Frame Width:	45"
Minimum Rough Opening:	45"
Preferred Rough Opening:	49"



84" Doors (fire-rated)

Clear Height:	84 ½"
Frame Height:	86 ¾"
Minimum Rough Opening:	88"
Preferred Rough Opening:	94"

Clear Width:	36"
Frame Width:	40"
Minimum Rough Opening:	40"
Preferred Rough Opening:	44"

94" Doors (non-fire-rated)

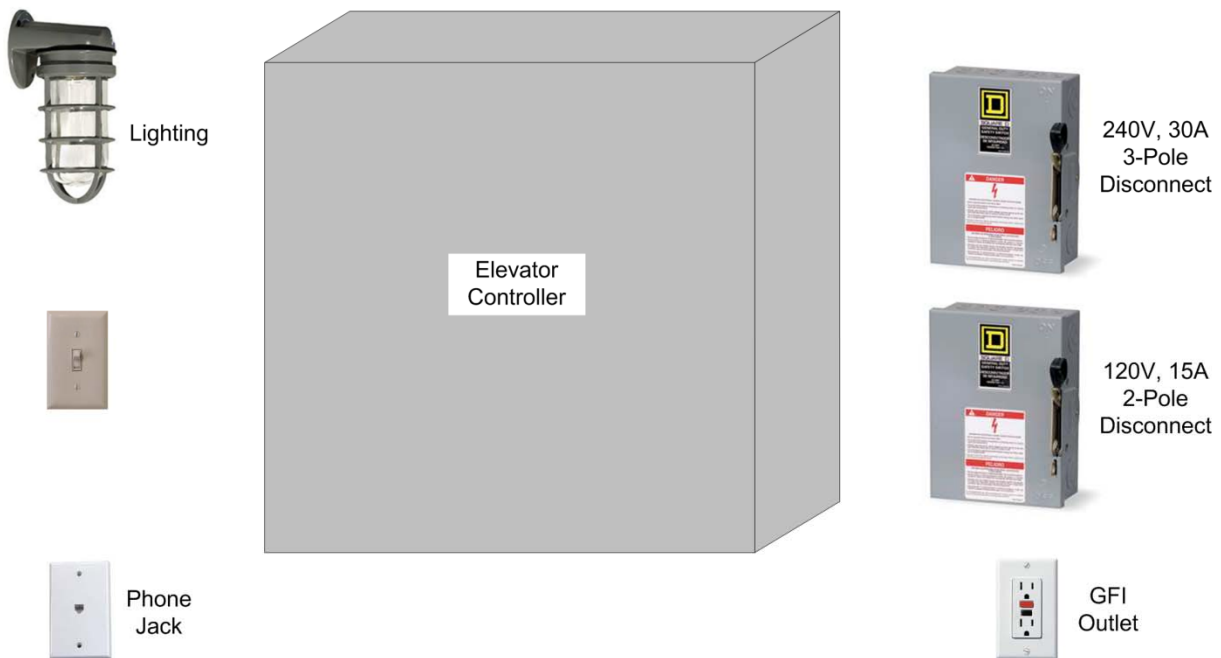
Clear Height:	94 ½"
Frame Height:	103 ½"
Minimum Rough Opening:	104"
Preferred Rough Opening:	106"

Clear Width:	35 ½"
Frame Width:	45"
Minimum Rough Opening:	45"
Preferred Rough Opening:	49"

Electrical Preparation

The elevator controller and pump unit will be placed in a closet nearby (machine room). There are several things that must be installed in the machine room. It is the responsibility of the contractor to install the following items.

- 240V, 30A Disconnect, Fused, 3 Pole, with Lockable Arm
Square D #D321N meets this requirement
Although the service is single phase, the elevator requires a 3 pole disconnect
Electrical code applies. There must be 36" of clear space in front of the disconnect.
- 120V, 15A Disconnect, Fused, 2 Pole, with Lockable Arm
Square D #D221N meets this requirement
Electrical code applies. There must be 36" of clear space in front of the disconnect.
- Live Phone Line
This can be a shared line. This will be routed from the controller to a phone located inside the elevator cab. It is required by code.
- GFI Outlet
This is needed for servicing the elevator. It is required by code.
- Lighting
The area around the controller must have a permanent light in a protected fixture, providing suitable light for servicing the elevator.



Site Preparation Checklist

The following items are the responsibility of the owner or general contractor. These items must be completed prior to beginning the elevator installation.

- ❑ Elevator main power supply. Permanent 240V, single phase, 30 ampere power to a lockable fused disconnect switch. This disconnect switch must be 3-pole. Disconnect switch must be mounted near the controller.
- ❑ Lighting power supply. Permanent 120V, 15 ampere power to a lockable fused disconnect switch. Disconnect switch must be mounted near the controller.
- ❑ Provide live telephone jack near the controller. This can be the common house line.
- ❑ Hoistway built as directed by drawings. Note: All measurements are finished dimensions – after drywall has been installed.
- ❑ Overhead clearance must meet the minimum requirements as outlined in the drawings.
- ❑ Rail wall blocking/supports as directed by drawings.
- ❑ Plumb and square hoistway with smooth surfaces. Hoistway must have drywall installed.
- ❑ If landing doors are swing doors, they are to be provided and installed by the customer or general contractor. Door hardware must be installed as well.
- ❑ If landing doors are swing doors, the 3-5 rule must be followed. Door threshold CANNOT exceed three (3) inches into hoistway. (Distance from backside of door to inside wall of hoistway.)
- ❑ If landing doors are sliding two-speed doors, then doors will be provided with the elevator equipment. Landing doorways must be framed with rough openings to match drawings provided. Additional sheet rock work WILL be required after the installation of the elevator has occurred. The owner or general contractor will be responsible for the sheet rock.
- ❑ Pit with dimensions that match the drawings. Pit must be level, and be constructed to handle the load as specified in drawings. Walls of the pit must be flush with walls of the hoistway.
- ❑ Acquire applicable permits.