# PLANNING GUIDE

# FOX VALLEY ELEVATOR

# Residential Hydraulic Elevator

Built on T or J-Rail

Series F114 Excelevator - 950/1,000 lbs. Series F116 Paca Ryde - 1,000 lbs.

> 1726 North Ballard Road, Suite 1 • Appleton, WI 54911 Direct Phone: 920-991-9082 Toll Free: 800-238-8739

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#### **Members Of:**

Fox Valley Elevator, LLC is a proud member of The American Society of Mechanical Engineers, The National Association of Elevator Contractors, The Canadian Elevator Contractors Association and The Accessibility Equipment Manufacturers Association. These organizations are symbols assure you of our commitment to high quality and accessibility to everyone.









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#### Introduction

This Planning Guide is to be used as a reference to determine parameters of installation and steps taken to achieve a proper elevator installation. This guide may be used by the architect, contractor, dealer or home owner. The information in this guide is intended as an overview. Each installation will have job specific specifications that must be followed. Do not attempt to construct a hoistway on this information.

Elevator installation is to be done by an authorized elevator contractor and in accordance with installation instructions provided by the manufacturer. Installation must also be in compliance with requirements of the National Electrical Code, American Society of Mechanical Engineers Safety Code, and state and local building codes. Fox Valley Elevator, LLC products are designed to meet the residential elevator requirements of ASME A17.1 Safety Code for Elevators and Escalators. The manufacturer assumes no liability for equipment not installed in compliance with these codes.

Fox Valley Elevator, LLC reserves the right to modify the design, technical specifications and dimensions of the products shown in this document.

#### **Planning Steps**

Locate a local authorized dealer and custom design your elevator together. Congratulations on choosing a hydraulic drive system. If you prefer a winding drum power based elevator please locate and use the Planning Guide for Residential Elevators with Winding Drum Technology. Please complete steps below to finish creating your elevator package.

- 1. Select rail system.
- 2. Layout machine room, and location.
- 3. Plan for electrical requirements.
- 4. Address national, state, and local code requirements.
- 5. Determine hoistway size, car size, layout configuration and available options. Please reference a Fox Valley Elevator Brochure for available design options: cab style, car operating panels, hall stations, phone boxes, handrails, light fixtures, and gates.
- 6. Obtain and follow site specific field drawings. Forward all necessary documents to contractor/builder, architect, and structural engineers. Use job specific drawings while building hoistway, doorways, machine room, and any other construction related to the elevator.
- 7. Coordinate with your authorized dealer to install your elevator, and enjoy your custom designed elevator.

Fox Valley Elevator, LLC will be referred as Fox Valley Elevator or FVE through out the remainder of this document.

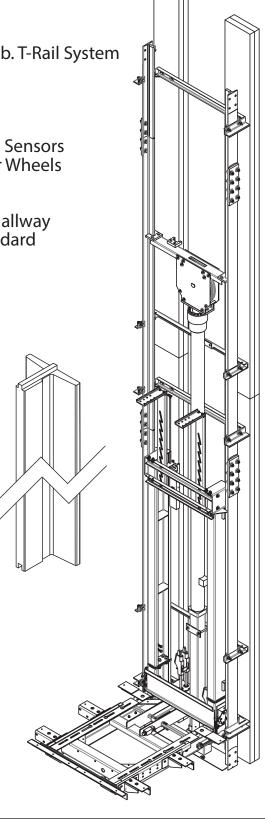
#### **Design Features & Mechanical Illustrations**

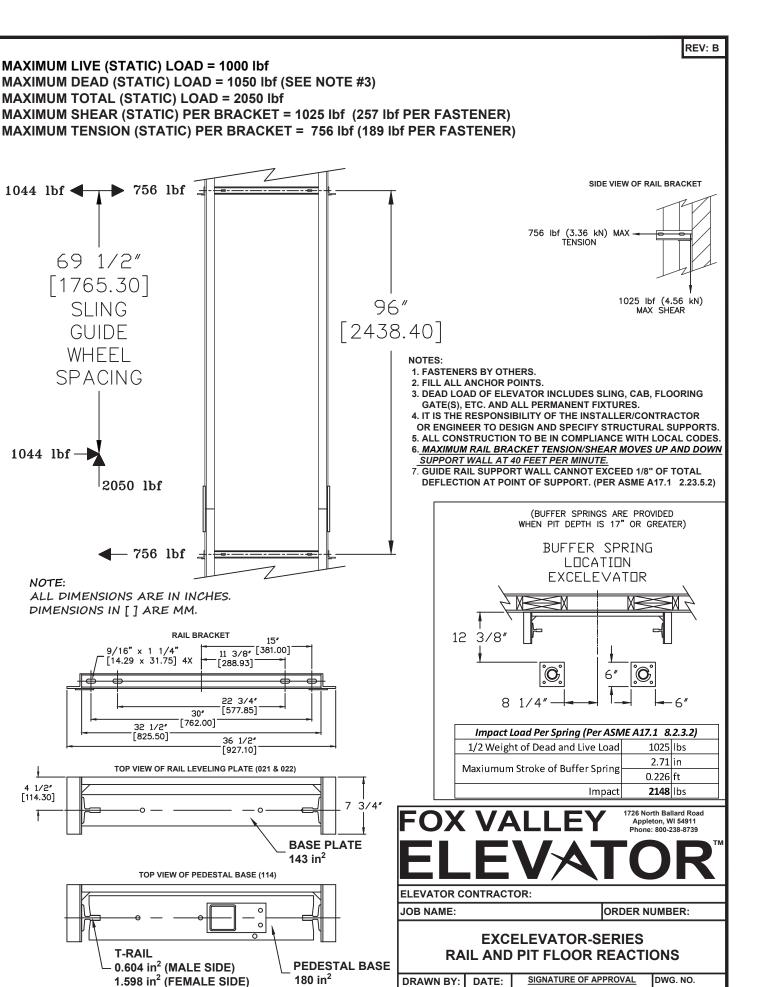
### <u>T-Rail System with Hydraulic Technology</u> (Series F114)

• Rigid Design Built on industry standard 8 lb. T-Rail System

Each Section is Up to 8 Feet Long

- Durable Cantilever Sling Design
- PLC Control System
- Multi-Speed Hydraulic Valve
- Tape Reader Locates Floors with Magnetic Sensors
- Sling Movement Translates Through Roller Wheels
- Field Programmable Homing
- Adjustable EMI & Light Timers
- Position Indicator available in car and/or hallway
- Emergency Manual Lowering Knob is standard





C-003071

1044 lbf **←** 

1044 lbf -

NOTE:

4 1/2"

[114.30]

69 1/2" [1765.30]

SLING

**GUIDF** WHFFI

SPACING

2050 lbf

DIMENSIONS IN [] ARE MM.

- 756 lbf

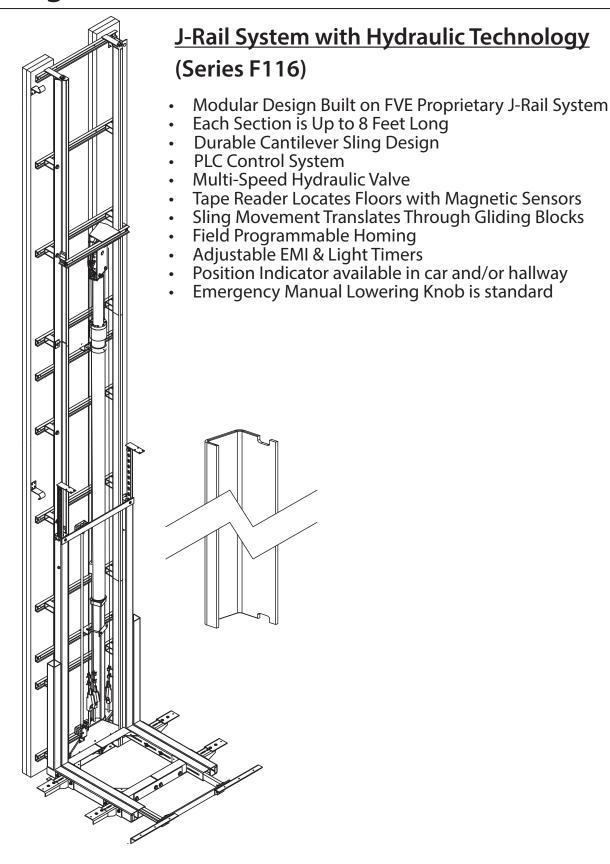
[14.29 x 31.75] 4X

32 1/24

[825.50]

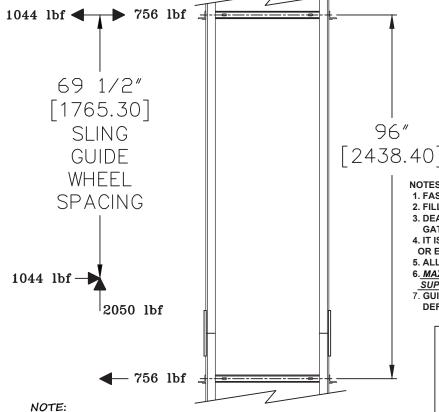
T-RAIL

#### **Design Features & Mechanical Illustrations**

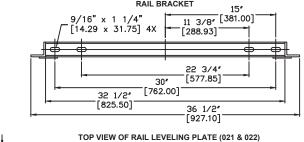


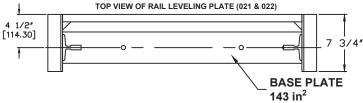
MAXIMUM LIVE (STATIC) LOAD = 1000 lbf MAXIMUM DEAD (STATIC) LOAD = 1050 lbf (SEE NOTE #3) MAXIMUM TOTAL (STATIC) LOAD = 2050 lbf

MAXIMUM SHEAR (STATIC) PER BRACKET = 1025 lbf (257 lbf PER FASTENER) MAXIMUM TENSION (STATIC) PER BRACKET = 756 lbf (189 lbf PER FASTENER)

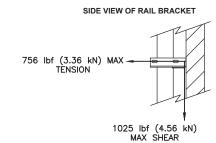


ALL DIMENSIONS ARE IN INCHES. DIMENSIONS IN [] ARE MM.

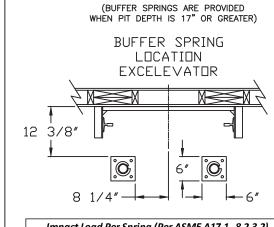




TOP VIEW OF PEDESTAL BASE (114) 0 T-RAIL 0.604 in<sup>2</sup> (MALE SIDE) PEDESTAL BASE 1.598 in<sup>2</sup> (FEMALE SIDE) 180 in<sup>2</sup>



- 1. FASTENERS BY OTHERS.
- 2. FILL ALL ANCHOR POINTS.
- 3. DEAD LOAD OF ELEVATOR INCLUDES SLING, CAB, FLOORING GATE(S), ETC. AND ALL PERMANENT FIXTURES.
- 4. IT IS THE RESPONSIBILITY OF THE INSTALLER/CONTRACTOR OR ENGINEER TO DESIGN AND SPECIFY STRUCTURAL SUPPORTS.
- 5. ALL CONSTRUCTION TO BE IN COMPLIANCE WITH LOCAL CODES.
- 6. MAXIMUM RAIL BRACKET TENSION/SHEAR MOVES UP AND DOWN SUPPORT WALL AT 40 FEET PER MINUTE
- 7. GUIDE RAIL SUPPORT WALL CANNOT EXCEED 1/8" OF TOTAL DEFLECTION AT POINT OF SUPPORT. (PER ASME A17.1 2.23.5.2)



Impact Load Per Spring (Per ASME A17.1 8.2.3.2)									
1/2 Weight of Dead and Live Load	1025	lbs							
Maxiumum Stroke of Buffer Spring	2.71	in							
Maxidiffulli Stroke of Buffer Spring	0.226	ft							
Impact	2148	lbs							

# 1726 North Ballard Road

**ELEVATOR CONTRACTOR:** 

JOB NAME:

ORDER NUMBER:

**EXCELEVATOR-SERIES** RAIL AND PIT FLOOR REACTIONS

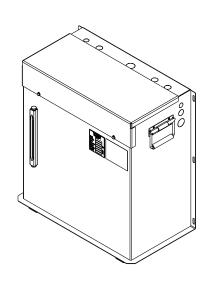
DRAWN BY:

DATE:

SIGNATURE OF APPROVAL

DWG. NO. C-003071

#### **Elevator Equipment - Hydraulic Elevator**



#### **Power Unit**

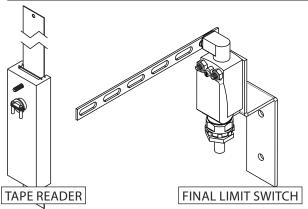
Equipped with constant displacement rotary screw pump powered by 3.0 horsepower, 230 volt single phase motor.

#### **Oil Tank**

Requires approximately 20 gallons of AW-32 high grade hydraulic oil. Also compatible with AW-46 and biodegradable (vegetable) hydraulic oil.

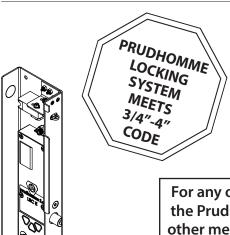
#### **Valve**

Two speeds for smooth starts and stops working pressure approximately 600 PSI at approximately 8.6 GPM.



#### **Stopping Devices**

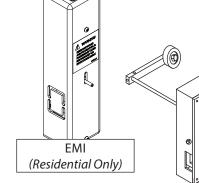
Magnetic tape reader for leveling accuracy & top final limit switch.



PRUDHOMME

#### **Hoistway Door Interlocks**

To prevent the opening of the hoistway door unless the car is within landing zone or stopped at landing.



For any other interlock other than the Prudhomme, a space guard or other means must be purchased to meet 3/4"-4" 2016 code or newer.

REFERENCE ASME A17.1/ CSA B44: 5.3.1.8 & 5.3.1.9 FOR DETAILS.

GAL TYPE "N"

#### **Hoistway Specifications - Hydraulic Elevator**

#### ATTENTION CONSTRUCTION CONTRACTOR:

Job specific documentation for hoistway construction from Fox Valley Elevator will be provided to your local dealer.

**Hoistway Construction Requirements** to be completed prior to elevator installation by contractor.

- 1. Electrical Requirements By Others:
  - Dedicated 230 VAC 60 Hertz 35 AMP Circuit Single Phase with ground and neutral,
  - A fused lockable disconnect switch with branch 3 pole circuit wire to suit a 30 AMP service, fused for 30 AMP dual element (time delay fuse) with neutral.
  - Dedicated 115 Volt, 15 AMP single phase circuit for car lighting and auxillary circuits.
  - Electrical wiring to comply with applicable codes.
  - Any VAC other than 230 VAC may require a buck/boost transformer.

#### NOTE:

Electrical requirements are for general reference only. All job specific electrical requirements must be acquired from job specific drawings provided by Fox Valley Elevator.

- 2. Unfinished/Un-installed Door Installation company may prefer a minimum of one hoistway door and associated framing be left unfinished/un-installed to accommodate elevator installation equipment and to prevent accidental damage to door and framing (preferably at grade level).
- **3. Plumb and Square Hoistway** Hoistway must be plumb within 1/8 inch per 10 feet of height and square at any point within 1/4 inch based on difference in diagonal measurements.
- **4. Supportive Structure** Structure must be capable of supporting the appropriate loads. Local engineering support is recommended.
- **5. Telephone Connection** Code requires a telephone connection to the elevator car; therefore, a phone line must be installed leading to the controller. It must also be capable of working for 4 hours during a power outage.
- **6. ASME A17.1 Section 5.3** Hoistway to be constructed in accordance with ASME A17.1 section 5.3 and all local codes.
- 7. Hoistway Door Security (Interlocks) All hoistway doors require interlocks as well as a door handle and a latch set. Interlocks will be installed by the elevator installers. Fox Valley Elevator requires the use of solid core doors and recommends spring door hinges.
- 8. Machinery Space, Machine Rooms, Control Spaces, and Control Rooms Layouts & Wiring All operating equipment must meet National Electrical Code and all local codes. Machine space must have a decicated convenience outlet and light with switch. The temperatures must be maintained between 60°- 110°F (15°C- 43°C) and must not be exposed to the elements with a max relative humidity of 90% (non-condensing).
- **9. No Alterations** Any alterations to the equipment without written authorization by Fox Valley Elevator will void all warranties.
- **10. Pit Floor Strength** A pit floor must be designed to withstand a load of 4,000 lbs. When used, concrete must be a minimum of 4" thick and rated at 3500 PSI.
- **11. Rated Load** Elevator system is rated for maximum capacity from the factory. Flooring, trim, and/or permanent decor added to elevator car must be subtracted from car capacity.
- **12. Verify Code Requirements** Verify national, state, and local code requirements are all met before installation.

# Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms Layouts & Wiring

#### **Disconnect Power Before Wiring**

- Locate controller enclosure in the machine room as required by code.
- Wire gauge requirements:
  - 10 gauge wire for power and motor wiring
  - 14 gauge minimum wire for lighting and aux circuits
  - 18 gauge wire for all low voltage
  - **Note:** Copper wire only.
- Refer to unit specific schematics and field drawings to complete wiring. Wire per N.E.C. and local codes.

**Note:** Not all controller terminals or travel cable wires may be used. High voltage and low voltage wires must run separate and only cross over perpendicular to each other.

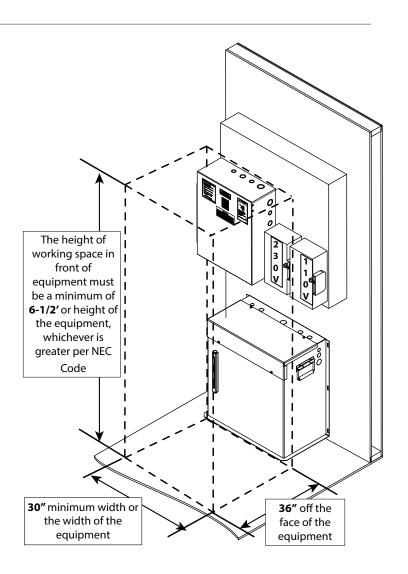
Locate and check for correct fuse sizes.

#### Per NEC Code 110.26 ......

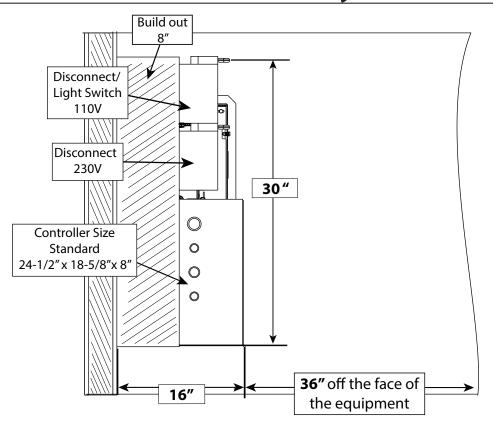
<u>Clear Working Space.</u> The working space required by this section must be clear at all times. **Therefore, this space isn't permitted for storage.** When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be suitably guarded.

Working Space. Equipment that may need examination, adjustment, servicing, or maintenance while energized must have working space provided in accordance with (1), (2) and (3):

- 1. <u>Depth of Working Space</u>. The working space, which is measured from the enclosure front, must not be less than the distance of 36".
- 2. Width of Working Space. The width of the working space must be a minimum of 30", but in no case less than the width of the equipment.



## Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms Layouts & Wiring



#### Per NEC Code 110.26 Continued ......

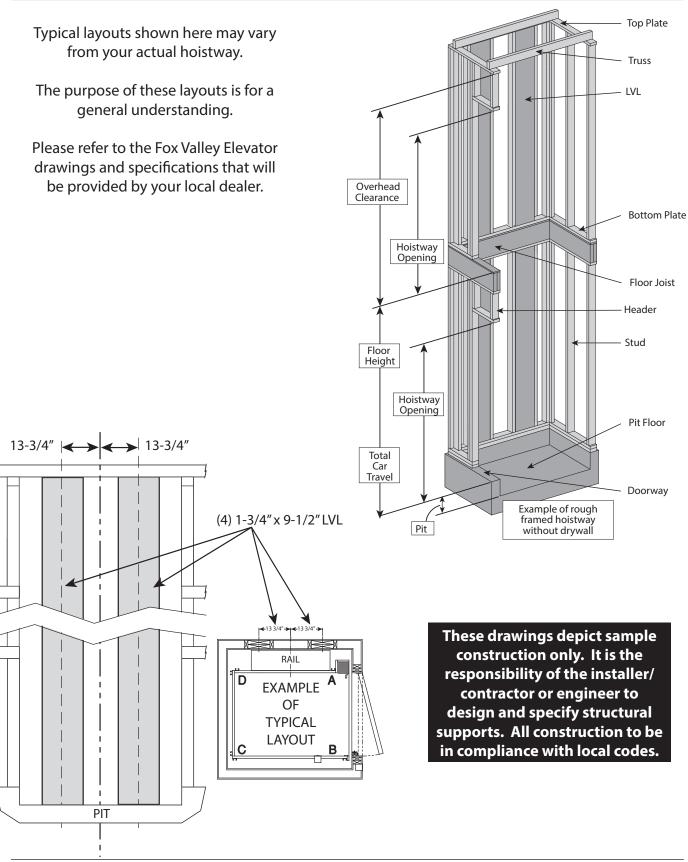
3. Height of Working Space (Headroom). The height of the working space in front of equipment must not be less than  $6\frac{1}{2}$  or the height of the equipment measured from the floor, grade or platform, whichever is greater.

Other equipment must not extend more than 6" into the controller working space.

#### **Additional Notes**

- A lockable service disconnect must be placed within sight of the controller and must be easily accessible in case of an emergency.
- Machine room and controller space must contain a convenience outlet and light with switch.
- The temperatures must be maintained between 60°- 110°F (15°C- 43°C) and must not be exposed to the elements with a max relative humidity of 90% (non-condensing).
- The frequency drive may be heard running for thermal heat dissipation at any time.

#### **Example Hoistway Construction** - Hydraulic Elevator



#### Hoistway Elevation View with T-Rail-Series F114

**Example of Hydraulic Elevator** 

#### **Required Overhead Heights**

Inside Cab Dimension	6′ 10″	7′0″	7′4″	8′0″
Minimum Hoistway Overhead Height	7′10″	8′0″	8'4"	9′0″

\*Custom sized cabs will alter these dimensions. Fox Valley Elevator will provide you with the appropriate dimensions. Please contact your local dealer to acquire alternate layouts.

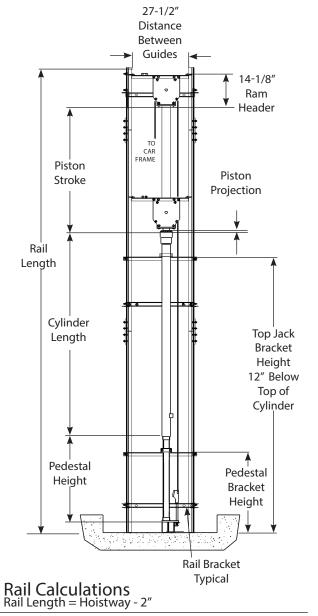
Cab Height - 6' min

This is a graphical representation of a hydraulic elevator on T-rail which offers up to six stops and a travel distance up to 50 feet.

#### Elevation

#### Minimum Overhead Inside Car **Dimensions** Overall Hoistway Top Floor Additional Floors 14" minimum travel between floors 50' Maximum Total 1st Floor Travel Pit Floor Pit Depth 10" Minimum Pit Depth 17" With **Buffer Springs Minimum**

#### Rail Layout and Jack Calculations



#### Hoistway Elevation View with J-Rail - Series F116

**Example of Hydraulic Elevator** 

#### **Required Overhead Heights**

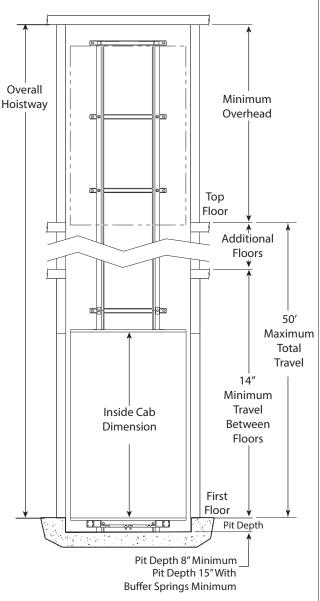
-		_		
Inside Cab Dimension	6′ 10″	7′0″	7′4″	8′0″
Minimum Overhead	7′ 10″	8′0″	8′4″	9′0″

Cab Height - 6' 10" min.

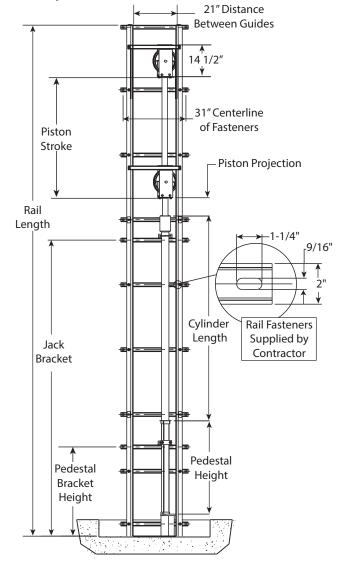
\*Custom sized cabs will alter these dimensions. Fox Valley Elevator will provide you with the appropriate dimensions. Please contact your local dealer to acquire alternate layouts.

This is a graphical representation of a hydraulic elevator on J-rail which offers up to six stops and a travel distance up to 50 feet.

#### Elevation



#### Rail Layout and Jack Calculations

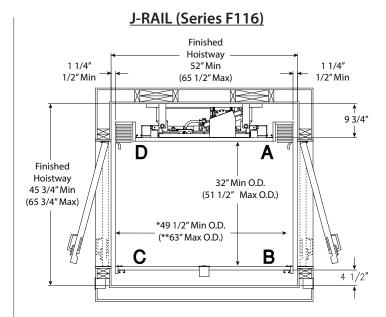


**Rail Calculations** 

Rail Length = Pit Depth + Travel + Car I.D. Height + 10''

#### Minimum and Maximum Dimensions

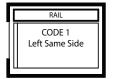
#### T-RAIL (Series F114) Finished Hoistway 1 1/4" 1 1/4" 52 1/2 Min 1/2" Min 1/2" Min (65 1/2") Finished Hoistway 45 1/2 Min 32" Min O.D. (63 1/2" Max) (50" Max O.D.) \*50" Min O.D. (\*\*63" Max O.D.) B



#### Note:

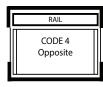
- 1. Minimum **DA** dimensions reflect rail centered in hoistway.
- 2. T-Rail (Series F114) minimum **DA** dimension for car without a gate recess is 37" O.D. (outside dimension) J-Rail (Series F116) minimum **DA** dimension for car without a gate recess is 36" O.D. (outside dimension)
- 3. Car I.D. (inside dimensions) can not exceed 12 sq. ft. for 750 lb. Car I.D. (inside dimensions) can not exceed 15 sq. ft. for 1,000 lb.

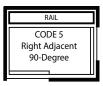
#### Car Opening Configurations and Coding

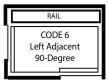


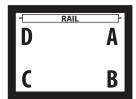












- 1. The DA is the side on which the rail is attached.
- 2. The first letter refers to the attachment location of the gate.
- 3. The second letter refers to the location of the strike plate.
- 4. If present, the third letter "R" denotes a recessed gate.

#### **Example**

#### First Gate - ABR

- A- gate attachment
- B strike plate
- R recessed gate

# Rail Opposite Openings ABR-DCR B

#### **Second Gate - DCR**

- D gate attachment
- C strike plate
- R recessed gate

PMQ1000-M

#### **Construction Notes:**

- Use specified rail backing from architect to frame into wall. Fox Valley Elevator recommends LVL's.
- The hoistway illustrations below show finished dimensions. Finished hoistway dimensions include drywall, plaster, and paint.
- A maximum of 3/4" (see "f" below) are allowed between the closed hoistway door and the outer edge of the landing sill.
- Determine height of hall station by local code.
- Rough frame door in place with extra space as needed for door interlock system, reference national and local codes.

The following examples are of units up to 1,000 lbs. Elevators are illustrated with accordion gates.

The following layouts were designed for travel up to 50 feet.

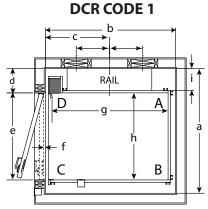
These symbols are listed beside the car size Fox Valley Elevator believes to be best suited for use by wheelchair passengers and their accompanying attendant.

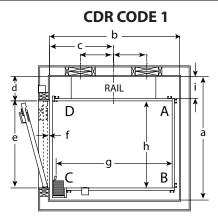


Recommended size for wheelchair passenger



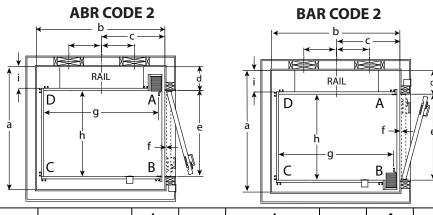
Recommended size for both wheelchair and attendant passengers





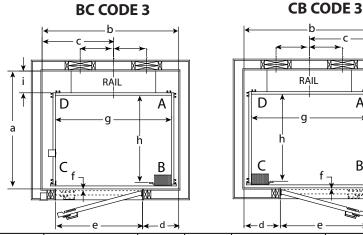
Hoistway			-	a	b	С		d	е	f	g	h		i
Layout	Sq Ft	Car Size	T-Rail (114)	J-Rail (116)			T-Rail (114)	J-Rail (116)					T-Rail (114)	J-Rail (116)
DCD	12 sq ft	48" X 36"	51"	51.75"	54.75"	26.5"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
DCR Code 1	15 sq ft	54" X 40" 🔥	55.5"	56.25"	60.75"	29.5"	14"	14.75"	36"	0.75"	54"	40"	9"	9.75"
	15 sq ft	60" X 36" 🖡	51"	51.75	66.75"	32.5"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"
60.0	12 sq ft	48" X 36"	52.5"	53.25"	54.75"	26.5"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
CDR Code 1	15 sq ft	54" X 40" 🔥	55"	55.75"	60.75"	29.5"	10"	10.75"	36"	0.75"	54"	40"	9"	9.75"
Code i	15 sq ft	60" X 36"	52.5"	53.25"	66.75"	32.5"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"

\*All dimensions are finished hoistway dimensions



Hoistway	istway			a	b	c		t	e	f	g	h		i
Layout	Sq Ft	Car Size	T-Rail (114)	J-Rail (116)			T-Rail (114)	J-Rail (116)					T-Rail (114)	J-Rail (116)
	12 sq ft	48" X 36"	51"	51.75"	54.75"	26.5"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
ABR Code 2	15 sq ft	54" X 40" 占	55.5"	56.25"	60.75"	29.5"	14"	14.75"	36"	0.75"	54"	40"	9"	9.75"
Code 2	15 sq ft	60" X 36"	51"	51.75"	66.75"	32.5"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"
5.45	12 sq ft	48" X 36"	52.5"	53.25"	54.75"	26.5"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
BAR Code 2	15 sq ft	54" X 40" 🖶	55"	55.75"	60.75"	29.5"	10"	10.75"	36"	0.75"	54"	40"	9"	9.75"
20022	15 sq ft	60" X 36" 🖡	52.5"	53.25"	66.75"	32.5"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"

\*All dimensions are finished hoistway dimensions

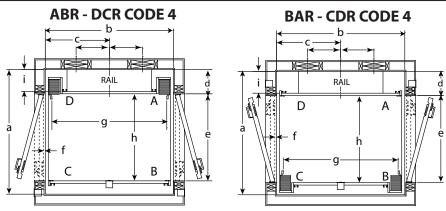


Hoistway			ā	3	b	С		d	е	f	g	h		i
Layout	Sq Ft	Car Size	T-Rail (114)	J-Rail (116)			T-Rail (114)	J-Rail (116)					T-Rail (114)	J-Rail (116)
	12 sq ft	48" X 36"	48.75"	49.5"	57"	29"	16"	16"	36"	0.75"	48"	36"	9"	9.75"
BC Code 3	15 sq ft	54" X 40" 🖶	52.75"	53.5"	63"	32"	22"	22"	36"	0.75"	54"	40"	9"	9.75"
Code 5	15 sq ft	60" X 36" <b>∳</b> Ł	48.75"	49.5"	69"	35"	28"	28"	36"	0.75"	60"	36"	9"	9.75"
	12 sq ft	48" X 36"	48.75"	49.5"	57"	29"	16"	16"	36"	0.75"	48"	36"	9"	9.75"
CB Code 3	15 sq ft	54" X 40" 🔥	52.75"	53 .5"	63"	32"	22"	22"	36"	0.75"	54"	40"	9"	9.75"
Code 3	15 sq ft	60" X 36" 🖡	48.75"	49.5"	69"	35"	28"	28"	36"	0.75"	60"	36"	9"	9.75"

\*All dimensions are finished hoistway dimensions

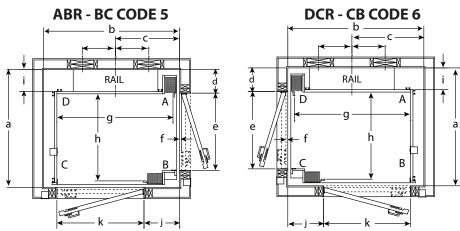
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Hoistway			a		b	С	d		e	f	g	h		i
Layout	Sq Ft	Car Size	T-Rail (114)	J-Rail (116)			T-Rail (114)	J-Rail (116)					T-Rail (114)	J-Rail (116)
	12 sq ft	48" X 36"	51"	52.25"	53.5"	26.75"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
ABR- DCR Code 4	15 sq ft	54" X 40"	55"	56.25"	59.5"	29.75"	14"	14.75"	36"	0.75"	54"	40"	9"	9.75"
Couc	15 sq ft	60" X 36"	51"	52.25"	65.5"	32.75"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"
	12 sq ft	48" X 36"	52.5"	53.25"	53.5"	26.75"	10"	10.75"	36"	0.75"	48"	36"	9"	9.75"
BAR - CDR Code 4	15 sq ft	54" X 40" 🔥	55"	55.75"	59.5"	29.75"	10"	10.75"	36"	0.75"	54"	40"	9"	9.75"
Code 4	15 sq ft	60" X 36"	52.5"	53.25"	65.5"	32.75"	10"	10.75"	36"	0.75"	60"	36"	9"	9.75"

\*All dimensions are finished hoistway dimensions



Hoistway			ā	<b>a</b>	b	C	C	ł	e	f	g	h		i	j	k
Layout	Sq Ft	Car Size	T-Rail (114)	J-Rail (116)			T-Rail (114)	J-Rail (116)					T-Rail (114)	J-Rail (116)		
400.06	12 sq ft	48" X 36"	48.75"	49.5"	55.75"	26.5"	9.75"	10.5"	32"	0.75"	48"	36"	9"	9.75"	14.75"	36"
ABR-BC Code 5	15 sq ft	54" X 40" 💺	52.75"	53.5"	61.75"	29.5"	9.75"	10.5"	36"	0.75"	54"	40"	9"	9.75"	20.75"	36"
Code 5	15 sq ft	60" X 36" <b>∳</b> Ł	48.75"	49.5"	67.75"	32.5"	9.75"	10.5"	32"	0.75"	60"	36"	9"	9.75"	26.75"	36"
2000	12 sq ft	48" X 36"	48.75"	49.5"	55.75"	26.5"	9.75"	10.5"	32"	0.75"	48"	36"	9"	9.75"	14.75"	36"
DCR-CB Code 6	15 sq ft	54" X 40" 占	52.75"	53.5"	61.75"	29.5"	9.75"	10.5"	36"	0.75"	54"	40"	9"	9.75"	20.75"	36"
Code o	15 sq ft	4¶ "36 X "00	48.75"	49.5"	67.75"	32.5"	9.75"	10.5"	32"	0.75"	60"	36"	9"	9.75"	26.75"	36"

\*All dimensions are finished hoistway dimensions

Notes	

# FOX VALLEY ELEVATOR

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