Planning Guide

Residential Hydraulic Elevators
Built on T or J-Rail

Series 114 - Excelevator Series
Series 116 - Paca Ryde
# Waupaca Elevator’s Mission Statement

Our mission is to deliver and support an enhanced quality of life for people with a need, or want, for vertical transportation. We are dedicated to our relationships, products, and industry through teamwork and education.

## Members Of:


![ASME Logo](image1.png) ![NAEC Logo](image2.png) ![ZEMA Logo](image3.png) ![CECA Logo](image4.png)

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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. Waupaca Elevators 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.

Waupaca Elevator Company, Inc., reserves the right to modify the design, technical specifications and dimensions of the products shown in this document.

## Planning Steps

Locate a local 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 Waupaca 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 dealer to install elevator, and enjoy your custom designed elevator.
Design Features & Mechanical Illustrations

T-Rail System with Hydraulic Technology
(Series 114)

- Design Built on 8 LBS. T-Rail System
- Each Section is Up to 8 Feet Long
- Durable Cantilever Sling Design
- PLC Control System
- Multi Coil 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
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)

1044 lbf \[\rightarrow\] 756 lbf

69 1/2"
[1765.30]
SLING
GUIDE
WHEEL
SPACING

1044 lbf \[\rightarrow\] 2050 lbf

756 lbf \[\rightarrow\]

96"
[2438.40]

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

RAIL BRACKET
9/16" x 1 1/4"
[14.29 x 31.75] 4X
15"
[381.00]

32 1/2"
[822.50]

36 1/2"
[927.10]

30"
[762.00]

22 3/4"
[577.85]

36 1/2"
[927.10]

T-RAIL
0.604 in² (MALE SIDE)
1.598 in² (FEMALE SIDE)

BASE PLATE
143 in²

TOP VIEW OF PEDESTAL BASE (114)

BUFFER SPRING LOCATION
EXCELEVATOR

SIDE VIEW OF RAIL BRACKET
756 lbf (3.36 kN) MAX TENSION
1025 lbf (4.56 kN) MAX SHEAR

8 1/4"
6"

Impact Load Per Spring (Per ASME A17.1 8.23.2.2)
1/2 Weight of Dead and Live Load
Maximum Stroke of Buffer Spring
Impact

1025 lbs
2.71 in
0.226 ft
2148 lbs

NOTES:
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.
   GUIDE RAIL SUPPORT WALL CANNOT EXCEED 1/8" OF TOTAL
   DEFLECTION AT POINT OF SUPPORT. (PER ASME A17.1 2.23.5.2)

BUFFER SPRINGS ARE PROVIDED
WHEN PIT DEPTH IS 17" OR GREATER

1728 North Ballard Road
Appleton, WI 54911
Phone: 900-238-8739

ELEVATOR CONTRACTOR:
JOB NAME:
ORDER NUMBER:

EXCELEVATOR-SERIES
RAIL AND PIT FLOOR REACTIONS

DRAWN BY: DATE: SIGNATURE OF APPROVAL
DWG. NO.: C-003071
Design Features & Mechanical Illustrations

J-Rail System with Hydraulic Technology
(Series 116)

- Modular Design Built on J-Rail System
- Each Section is Up to 8 Feet Long
- Durable Cantilever Sling Design
- PLC Control System
- Multi Coil Valve
- Tape Reader Locates Floors with Magnetic Sensors
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MAXIMUM SHEAR (STATIC) PER BRACKET = 1025 lb (257 lb PER FASTENER)
MAXIMUM TENSION (STATIC) PER BRACKET = 756 lb (189 lb PER FASTENER)

1044 lbf → 756 lbf

69 1/2" [1765.30]
SLING GUIDE WHEEL SPACING

1044 lbf → 2050 lbf
← 756 lbf

NOTE:
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WAUPACA ELEVATOR COMPANY
1726 North Ballard Road
Appleton, WI 54911
Phone: 800-238-8739

ELEVATOR CONTRACTOR:          ORDER NUMBER:
JOB NAME:                        

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.

**Hoistway door interlocks**
EMI or GAL Type “N”
To prevent the opening of the hoistway door from landing side unless the car is within landing zone or stopped at landing.
**Hoistway Specifications - Hydraulic Elevator**

**ATTENTION CONSTRUCTION CONTRACTOR:**
Job specific documentation will be provided by Waupaca Elevator from which to construct the hoistway.

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

1. **Electrical Requirements By Others:**
   - Dedicated 230 VAC up to 35 AMP circuit single phase with ground and neutral, 60 Hertz.
   - A fused 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.
   - 115 Volt, 15 AMP single phase circuit for car lighting.
   - 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 Waupaca Elevator Company, Inc.

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 ft. 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. Waupaca Elevator requires the use of solid core doors and recommends spring door hinges.

8. **Hoistway Requirements** - Any operating equipment must meet National Electrical Code and all local codes. Machine space must have a light switch and a convenience outlet. Temperature must be maintainable between 60° - 110° F and must not be exposed to the elements (with a relative humidity not to exceed 95%).

9. **No Alterations** - Any alterations to the equipment without written authorization by Waupaca 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, walls, trim, base, 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.
Machine Space, Controller Install & Wiring

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

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

- Locate and check for correct fuse sizes.

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**Per NEC Code 110.26 .......**

**Clear Working Space.** 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. **Depth of Working Space.** 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.
**Per NEC Code 110.26 Continued .......**

1. **Height of Working Space (Headroom).** The height of the working space in front of equipment must not be less than 6½’ measured from the grade, floor, platform, or the equipment height, 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 must contain a convenience outlet and light with switch.

- The temperatures must be maintained between 60°- 110°F and must not be exposed to the elements (with a relative humidity not to exceed 95%).
Example Hoistway Construction - Hydraulic Elevator

Typical layouts shown here may vary from your actual hoistway.

The purpose of these layouts is for a general understanding.

Please refer to the Waupaca Elevator drawings and specifications that will be provided by your local dealer.

These drawings depict sample construction only. It is the responsibility of the installer/contractor or engineer to design and specify structural supports. All construction to be in compliance with local codes.
**Hoistway Elevation View with T-Rail - Series 114**

Example of Hydraulic Elevator

### Required Overhead Heights

<table>
<thead>
<tr>
<th>Inside Cab Dimension</th>
<th>6' 10&quot;</th>
<th>7' 0&quot;</th>
<th>7' 4&quot;</th>
<th>8' 0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Hoistway Overhead Height</td>
<td>7' 10&quot;</td>
<td>8' 0&quot;</td>
<td>8' 4&quot;</td>
<td>9' 0&quot;</td>
</tr>
</tbody>
</table>

Cab Height - 6' min

*Custom sized cabs will alter these dimensions. Waupaca 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 T-rail which offers up to six stops and a travel distance up to 50 feet.

### Rail Layout and Jack Calculations

**Rail Calculations**

Rail Length = Hoistway - 2"

**Elevation**

Minimum Overhead

Inside Car Dimensions

Overall Hoistway

Top Floor

Additional Floors

1st Floor

Pit Floor

Pit Depth 10" Minimum
Pit Depth 17" Width
Buffer Springs Minimum

27-1/2" Distance Between Guides

14-1/8" Ram Header

Piston Stroke

Cylinder Length

Top Jack Bracket Height
12" Below Top of Cylinder

Pedestal Height

Pedestal Bracket Height

Rail Bracket Typical

50' Maximum Total Travel

14" minimum travel between floors

Rail Bracket - Typical

Example of Hydraulic Elevator 14" minimum travel between floors Additional Floors 50' Maximum Total Travel 14" minimum travel between floors

PMQ1000-I

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HYDRAULIC ELEVATOR PLANNING GUIDE
**Hoistway Elevation View with J-Rail - Series 116**

**Example of Hydraulic Elevator**

**Required Overhead Heights**

<table>
<thead>
<tr>
<th>Inside Cab Dimension</th>
<th>6' 10&quot;</th>
<th>7' 0&quot;</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Minimum Overhead</td>
<td>7' 10&quot;</td>
<td>8' 0&quot;</td>
<td>8' 4&quot;</td>
<td>9' 0&quot;</td>
</tr>
</tbody>
</table>

Cab Height - 6’ 10” min.

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.

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

**Rail Calculations**

Rail Length = Pit Depth + Travel + Car I.D. Height + 10”
Example Hoistway Layouts - Hydraulic Elevator

Minimum and Maximum Dimensions

### T-RAIL (Series 114)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finished Hoistway</td>
<td>52 1/2 Min (65 1/2&quot;)</td>
<td>52 1/2 Min (65 1/2&quot;)</td>
</tr>
<tr>
<td>1 1/4&quot; 1/2&quot; Min</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
</tr>
<tr>
<td>32&quot; Min. O.D. (50&quot; Max O.D.)</td>
<td>*50&quot; Min. O.D. (**63&quot; Max O.D.)</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
</tr>
</tbody>
</table>

### J-RAIL (Series 116)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finished Hoistway</td>
<td>45 3/4 Min (65 3/4&quot;)</td>
<td>45 3/4 Min (65 3/4&quot;)</td>
</tr>
<tr>
<td>1 1/4&quot; 1/2&quot; Min</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
</tr>
<tr>
<td>32&quot; Min. O.D. (51 1/2&quot; Max O.D.)</td>
<td>*49 1/2&quot; Min. O.D. (**63&quot; Max O.D.)</td>
<td>1 1/4&quot; 1/2&quot; Min</td>
</tr>
</tbody>
</table>

Note:
1. Minimum DA dimensions reflect rail centered in hoistway.
2. T-Rail (Series 114) minimum DA dimension for car without a gate recess is 37" O.D. (outside dimension)
   J-Rail (Series 116) 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

- **CODE 1**: Left Same Side
- **CODE 2**: Right Same Side
- **CODE 3**: Front
- **CODE 4**: Opposite
- **CODE 5**: Right Adjacent 90-Degree
- **CODE 6**: Left Adjacent 90-Degree

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

**Second Gate - DCR**
- D - gate attachment
- C - strike plate
- R - recessed gate
Example Hoistway Layouts - Hydraulic Elevator

Construction Notes:
- Use specified rail backing from architect to frame into wall.
- The hoistway illustrations below show finished dimensions. Finished hoistway dimensions include drywall, plaster and paint.
- 3/4" is recommended between the inside closed hoistway door face and the edge of the sill. (see “f” below)
- Determine height of hall station per local code and ADA requirements.
- Rough frame door in place with an extra inch of space on each side of the door to allow for door installation.
- Determine rail type and reference appropriate columns and dimensions based on layout configurations listed charts below.

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 Waupaca Elevator believes to be best suited for use by wheelchair passengers and their accompanying attendant.

<table>
<thead>
<tr>
<th>Hoistway Layout</th>
<th>Sq Ft</th>
<th>Car Size</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCR Code 1</td>
<td></td>
<td>12 sq ft</td>
<td>51.5&quot;</td>
<td>52.25&quot;</td>
<td>53.75&quot;</td>
<td>26.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 sq ft</td>
<td>55.5&quot;</td>
<td>56.25&quot;</td>
<td>59.75&quot;</td>
<td>29.5&quot;</td>
<td>14&quot;</td>
<td>14.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>54&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 sq ft</td>
<td>51.5&quot;</td>
<td>52.25&quot;</td>
<td>65.75&quot;</td>
<td>32.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>60&quot;</td>
</tr>
<tr>
<td>CDR Code 1</td>
<td></td>
<td>12 sq ft</td>
<td>52.5&quot;</td>
<td>53.25&quot;</td>
<td>53.75&quot;</td>
<td>26.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 sq ft</td>
<td>55&quot;</td>
<td>55.75&quot;</td>
<td>59.75&quot;</td>
<td>29.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>54&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 sq ft</td>
<td>52.5&quot;</td>
<td>53.25&quot;</td>
<td>65.75&quot;</td>
<td>32.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

*All dimensions are finished hoistway dimensions

*Recommended size for wheelchair passenger
*Recommended size for both wheelchair and attendant passengers

*DCR Code 1

*CDR Code 1
## Example Hoistway Layouts - Hydraulic Elevator

### ABR Code 2

<table>
<thead>
<tr>
<th>Hoistway Layout</th>
<th>Sq Ft</th>
<th>Car Size</th>
<th>a T-Rail (114)</th>
<th>b J-Rail (116)</th>
<th>c T-Rail (114)</th>
<th>d J-Rail (116)</th>
<th>e T-Rail (114)</th>
<th>f J-Rail (116)</th>
<th>g T-Rail (114)</th>
<th>h J-Rail (116)</th>
<th>i T-Rail (114)</th>
<th>J-Rail (116)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABR Code 2</td>
<td>12 sq ft</td>
<td>48&quot; X 36&quot;</td>
<td>51.5&quot;</td>
<td>52.25&quot;</td>
<td>53.75&quot;</td>
<td>26.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>48&quot;</td>
<td>36&quot;</td>
</tr>
<tr>
<td></td>
<td>15 sq ft</td>
<td>54&quot; X 40&quot;</td>
<td>55.5&quot;</td>
<td>56.25&quot;</td>
<td>59.75&quot;</td>
<td>29.5&quot;</td>
<td>14&quot;</td>
<td>14.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>54&quot;</td>
<td>40&quot;</td>
</tr>
<tr>
<td></td>
<td>15 sq ft</td>
<td>60&quot; X 36&quot;</td>
<td>51&quot;</td>
<td>52.25&quot;</td>
<td>65.75&quot;</td>
<td>32.5&quot;</td>
<td>10&quot;</td>
<td>10.75&quot;</td>
<td>36&quot;</td>
<td>0.75&quot;</td>
<td>60&quot;</td>
<td>36&quot;</td>
</tr>
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### BAR Code 2

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<th>Car Size</th>
<th>a T-Rail (114)</th>
<th>b J-Rail (116)</th>
<th>c T-Rail (114)</th>
<th>d J-Rail (116)</th>
<th>e T-Rail (114)</th>
<th>f J-Rail (116)</th>
<th>g T-Rail (114)</th>
<th>h J-Rail (116)</th>
<th>i T-Rail (114)</th>
<th>J-Rail (116)</th>
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<tbody>
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<td>15 sq ft</td>
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### BC Code 3

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<th>b J-Rail (116)</th>
<th>c T-Rail (114)</th>
<th>d J-Rail (116)</th>
<th>e T-Rail (114)</th>
<th>f J-Rail (116)</th>
<th>g T-Rail (114)</th>
<th>h J-Rail (116)</th>
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<tr>
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### CB Code 3

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<td>0.75&quot;</td>
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</tbody>
</table>

*All dimensions are finished hoistway dimensions.
**Example Hoistway Layouts - Hydraulic Elevator**

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<thead>
<tr>
<th>Hoistway Layout</th>
<th>Sq Ft</th>
<th>Car Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>T-Rail (114)</th>
<th>J-Rail (116)</th>
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