

# Installation Instructions

## Dynarail® Safety Ladder System

SI Units



HIGH PERFORMANCE COMPOSITE SOLUTIONS



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# Simplified Ladder Instructions



The **Dynarail® Safety Ladder System** has been designed to combine the best in fiberglass reinforced plastic (FRP) ladders and cages with simplicity of installation. Fibergrate has made every attempt to provide clear and thorough instructions for installing these products. If you have any further questions, or need additional information, do not hesitate to contact Fibergrate at (800) 527-4043.

By following these simple instructions, you should find installation of your ladder system quick and easy.

## TOOLS REQUIRED

- Drill**
- Bits**
  - 1/8" (3.2mm) (for rivets)
  - 9/16" (14mm) & 11/16" (17mm) (for connection bolts)
- 8m Tape Measure**
- Sealing Kit**
- Bonding (Epoxy) Kit(s)**
- Wrenches**
  - 7/16" (11mm)(2 each)
  - 9/16" (14mm) (2 each)
- Sandpaper (80 grit)**
- Hack Saw**
- Level**
- Stir Sticks**
- "C" Clamps**

**NOTE:** Cuts and drilled holes must be sealed to maintain corrosion protection.

## QUICK TIPS FOR INSTALLING LADDERS



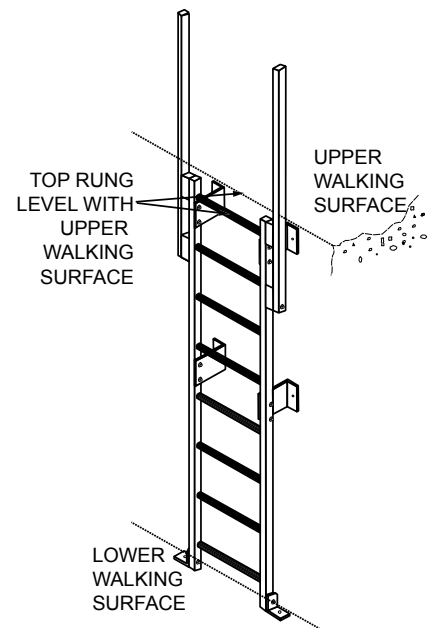
1. Layout ladder, walk thru, wall mount kits and floor mount kits. Cut ladder as required (see **Section I - Installing Ladder and Walk thru**). Attach walk thru to ladder (see **Section I - Installing Ladder and Walk thru**). Attach wall mounts to ladder and mount on wall (see **Section I - Installing Ladder and Walk thru - To Install Wall Mounts**). Attach floor mount clip to ladder and bolt to floor (see **Section I - Installing Ladder and Walk thru - Installing Floor Mounts**).
2. If installing cage, after installation of the ladder, follow the instructions shown in **Section II - Installing Cage** for installation of hoop brackets, hoops and vertical bars.

## IMPORTANT

It is the installer's responsibility to carefully follow fabrication and installation plans and instructions to ensure design performance characteristics of the Dynarail® ladder system.

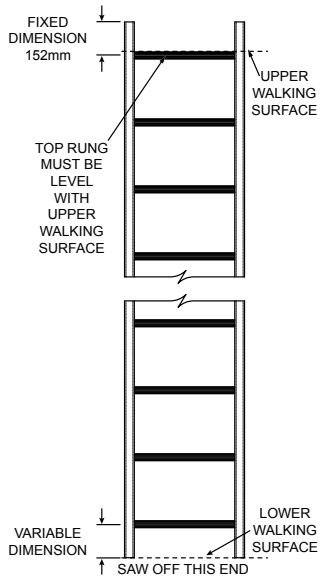
The installer could be liable for claims that result from improper installation.

**DRAWING A -  
INSTALLED LADDER**



# Section I - Installing Ladder

**DRAWING B - VARIABLE & FIXED DIMENSIONS**

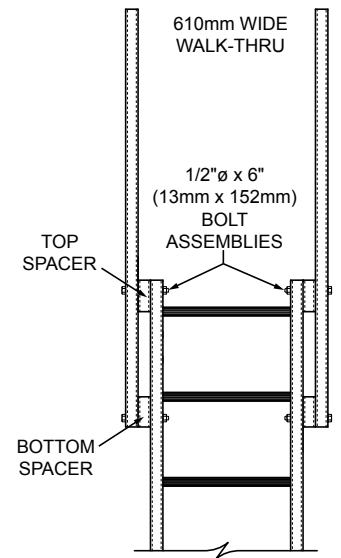


**INSTALLING LADDER AND WALK THRU**

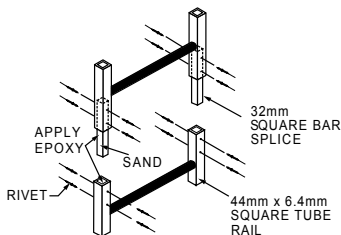
1. Determine required ladder height by measuring from walking surface at bottom of ladder to step-off at top of ladder. Add 152mm to obtain the required overall ladder length. Any adjustment in the ladder length should be made at the ladder bottom (walking surface end - see **Drawing B**). For example, if the overall ladder length determined is 2565mm and you are working with a 3048mm ladder, be sure 152mm inches are left from the step-off rung to the top and cut 483mm from the opposite end (see **Drawing B**).
2. If installing the standard 457mm wide walk thru, mix and apply epoxy to splice end (see **Drawing C**) of one of the walk thru posts and insert splice end into the ladder side rail at the top end (see **Drawing D**). Drill for, and install, 4 rivets - 2 on each side of rail. Repeat with other post.

If installing the 610mm wide walk thru, place top spacer of one walk thru post as shown in **Drawing E**, drill and bolt loosely into place. Place the bottom spacer in place, match drill and bit into place. Tighten all bolts. Repeat with other walk thru post.

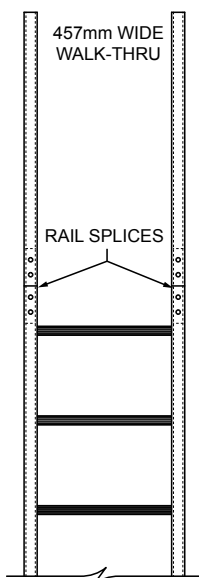
**DRAWING E - 610mm WIDE WALK THRU WITH SPACERS**



**DRAWING C - LADDER RAIL SPLICE**



**DRAWING D - 457mm WIDE WALK THRU WITH SPLICES**



**INSTALLING WALL MOUNT BRACKETS**

*Note: Maximum 1.8m spacing between brackets and maximum 1.8m from bottom end of ladder to first bracket. Ladder must be attached to wall or structure at the top rung.*

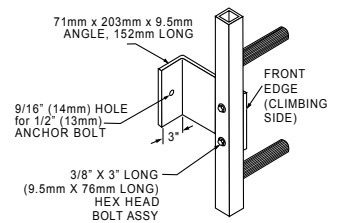
3. With pencil, mark location on wall and ladder where brackets are to be mounted.
4. Locate end of the first wall mount flush with front edge of ladder (**Drawing F**). Match drill two 7/16" (11mm) diameter holes in ladder rail and bolt bracket to ladder with 3/8" x 3" (9.5mm x 76mm) hex head bolt assemblies. Continue with all wall mount brackets.
5. Drill wall for anchor bolts.
6. Mount ladder to wall with top rung flush with step-off.

**INSTALLING FLOOR MOUNT CLIPS**

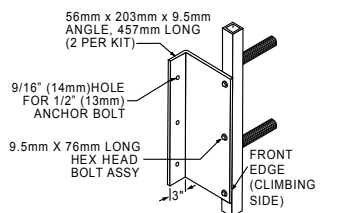
*Note: If floor mount cannot be used, substitute bottom wall mount (Drawing G) and install at bottom of ladder using steps 3-6.*

7. Place the floor clip flush with bottom of ladder rail, mark holes in bottom of ladder rail and drill a 7/16" (11mm) diameter hole (**Drawing H**). Repeat for opposite rail. Bolt floor clips to ladder with 3/8" x 3" (9.5mm x 76mm) hex head bolt assemblies.
8. Drill floor for anchor bolts.
9. Bolt ladder to floor (**Drawing H**).

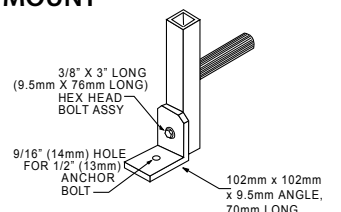
**DRAWING F - STANDARD WALL MOUNT**



**DRAWING G - BOTTOM WALL MOUNT**

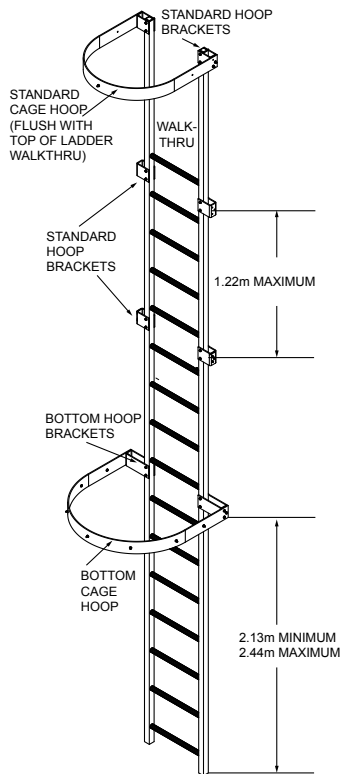


**DRAWING H - FLOOR MOUNT**

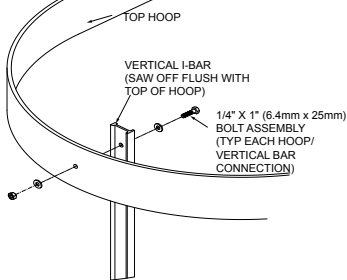


# Section II - Cage Installation

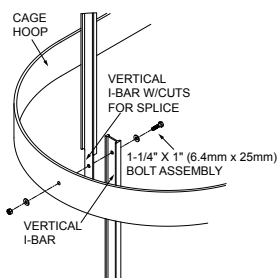
**DRAWING I - TOP AND BOTTOM CAGE HOOPS**



**DRAWING J - VERTICAL I-BAR CONNECTION**

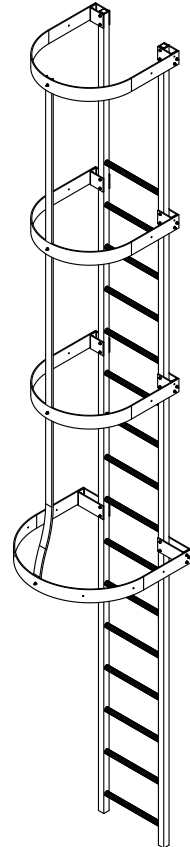


**DRAWING K - VERTICAL I-BAR SPLICE**

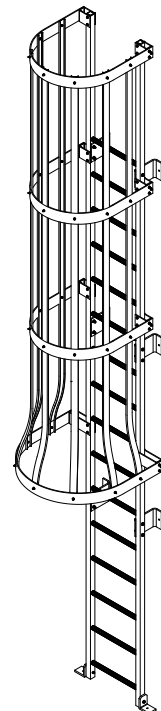


1. If your ladder has an 457mm wide walk thru, locate uppermost standard cage hoop bracket flush with inside edge and top of ladder square tube rail (**Drawing I**). If your ladder has a 610mm wide walk thru, eliminate the top cage hoop brackets and attach the hoops directly to the walk thru rails using 1/4" x 2-1/2" (6.4mm x 64mm) round head bolts. Proceed as for 457mm wide walk thru with remaining installation.
2. Using standard cage hoop brackets as templates, drill 5/16" (7.9mm) diameter mounting holes through the ladder rail. Bolt top hoop brackets to the ladder using the 1/4" x 3" (6.4mm x 76mm) round head bolt assemblies provided.
3. Locate bottom hoop brackets by measuring from outside of top bracket to outside of bottom cage bracket for cage height (**Drawing I**). Bottom hoop bracket should be 2.1m minimum, 2.4m maximum from walking surface at bottom of ladder. **Remember, hoops should be maximum 1.2m apart (see step 5).**
4. Using bottom hoop brackets as templates, drill and bolt intermediate hoop brackets to ladder using the 1/4" x 3" (6.4mm x 76mm) round head bolt assemblies provided.
5. After all brackets are attached, mount the cage hoops to the brackets using the 1/4" x 1-1/4" (6.4mm x 32mm) bolt assemblies provided (**Drawing I**).
6. Install the vertical I-bars beginning at the bottom hoop by centering vertical bar over the hole in the hoop, match drilling a 5/16" (7.9mm) diameter hole, and bolting with the 1/4" x 1" (6.4mm x 25mm) long bolt with two flat washers and hex nut (**Drawing J**). Continue with the remaining hoops (**Drawing L**). (If vertical bars are not long enough, splice per **Drawing K**). Saw the bar flush with the top hoop.
7. Repeat step #6 until all seven vertical bars are installed.
8. Continue with steps #3 through #9 to finish your Dynarail FRP ladder system installation (**Drawing M**).

**DRAWING L - VERTICAL BAR INSTALLED**



**DRAWING M - INSTALLED LADDER WITH CAGE**



# Section III - Technical Information

## OSHA REQUIREMENTS FOR LADDERS & LADDER SYSTEMS

From the Code of Federal Regulations, Title 29, Labor, 1910.27

*Installer is responsible for referring to most current OSHA Code for complete information.*

1. (a)(1)(i) 0.9 kN concentrated load (minimum at center of rung)
2. (b)(1)(ii&iii) Distance between rungs maximum 305mm, minimum clear width between side rails of 406mm
3. (c)(4) Distance from the center line of rungs to wall in back of ladder shall be not less than 178mm
4. (d)(1)(ii) Cage required on ladders of more than 6.1m to a maximum unbroken length of 9.2m
5. (d)(1)(iii) Cage to extend minimum of 1067mm above top of landing
6. (d)(1)(iv) Cage shall begin minimum 2.1 to maximum 2.4 above base of ladder (floor)
7. (d)(1)(v) Cage shall not be less than 686mm in width
8. (d)(1)(v) Cage hoop vertical bars shall be located at a maximum spacing of 40° around the circumference of the cage

## TECHNICAL DATA

*(All materials are yellow vinyl ester, fire retardant - VEFR)*

### LADDER:

Maximum length without splice	7.3m	Outside Diameter of rung	32mm
Maximum ladder length with cage	10.2m	Inside Diameter of rung	22mm
Clear inside width (inside rail to rail)	457mm	Rail - outside width	44mm
Outside width (outside rail to rail)	546mm	Rail - wall thickness	6.4mm
Rung Spacing (center to center)	305mm	Weight per foot (approximately)	4.0 kg/m

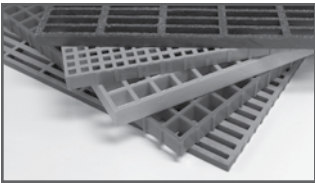
### CAGE:

Product	Description
<b>Standard Hoop Kit</b> (PN 448200)	686mm from center line of ladder rung to inside of hoop 76mm wide x 6.4mm thick hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Bottom Hoop Kit</b> (PN 448000)	787mm from center line of ladder rung to inside of hoop 76mm wide x 6.4mm thick hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Hoop Brackets</b> (Included with hoop kits)	6.4mm thick, "U" shaped hand layup Predrilled holes <i>(with necessary bolt assemblies)</i>
<b>Vertical I-Bars</b> (PN 446211 - 3.1m; PN 446210 - 6.1m)	I-Bar, 138mm deep x 16mm flange x 3.2mm thick
<b>Bottom Wall Mount Bracket Kit*</b> (PN 448400 ISOFR Dk Gray, PN 448401 VEFR Beige ) <i>Required when ladder cannot be floor mounted</i>	56mm x 203mm x 9.5mm angle, 457mm long Two per set <i>(with necessary bolt assemblies)</i>
<b>Wall Mount Bracket Kit*</b> (PN 448500 ISOFR Dk Gray, PN 448501 VEFR Beige )	56mm x 203mm x 9.5mm angle, 152mm long 178mm from wall to center of rung Two per set <i>(with necessary bolt assemblies)</i>
<b>Floor Mount Clip Kit*</b> (PN 448700 ISOFR Dk Gray, PN 448701 VEFR Beige)	102mm x 102mm x 9.5mm angle, 70mm long Two per set <i>(with necessary bolt assemblies)</i>

**\*NOTE:** *Wall mount brackets and floor mount clips are predrilled with 9/16" (14mm) diameter holes for 1/2" (13mm) diameter anchor bolts only. Anchor bolts not included.*

# Fibergrate Products & Services

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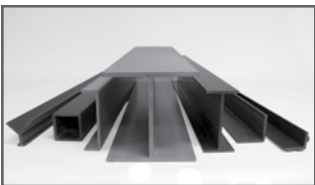
## Fibergrate® Molded Grating

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## Safe-T-Span® Pultruded Industrial & Pedestrian Gratings

Combining corrosion resistance, long-life and low maintenance, Safe-T-Span® provides unidirectional strength for industrial and pedestrian pultruded grating applications.



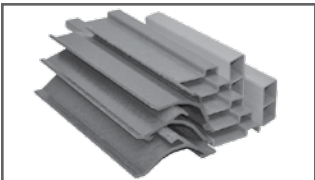
## Dynaform® Structural Shapes

Fibergrate offers a wide range of standard Dynaform® pultruded structural profiles for industrial and commercial use, including I-beams, wide flange beams, round and square tubes, bars, rods, channels, leg angles and plate.



## Dynarail® & DynaRound™ Guardrail, Handrail & Ladder

Easily assembled from durable components or engineered and prefabricated to your specifications, Dynarail square tube and DynaRound round tube railing systems and Dynarail safety ladder systems meet or exceed OSHA and strict building code requirements for safety and design.



## Custom Composite Solutions

Combining Fibergrate's design, manufacturing and fabrication services allows Fibergrate to offer custom composite solutions to meet our client's specific requirements. Either through unique pultruded profiles or custom open molding, Fibergrate can help bring your vision to reality.



## Design & Fabrication Services

Combining engineering expertise with an understanding of fiberglass applications, Fibergrate provides turnkey design and fabrication of fiberglass structures, including platforms, catwalks, stairways, railings and equipment support structures.



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Whether a customer requires a platform in a mine in South Africa to grating on an oil rig in the North Sea, or walkways in a Wisconsin cheese plant to railings at a water treatment facility in Brazil; Fibergrate has sales and service locations throughout the world to meet the needs and exceed the expectations of any customer.

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