

# Installation Instructions Dynarail® Safety Ladder System



*Building the World to Last™*

HIGH PERFORMANCE COMPOSITE SOLUTIONS



- Corrosion
- Fire
- UV Resistant
- Clock
- HIGH**  
Strength : Weight
- Low Install Cost
- No Tools
- No Lightning

# 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

- |  |   |
|--|---|
| <input type="checkbox"/> <b>Drill</b>  | <input type="checkbox"/> <b>Wrenches</b>            |
| <input type="checkbox"/> <b>Bits</b>   | <input checked="" type="checkbox"/> 7/16" (2 each)  |
| <input checked="" type="checkbox"/> 1/8" (for rivets)                        | <input checked="" type="checkbox"/> 9/16" (2 each)  |
| <input checked="" type="checkbox"/> 9/16" & 11/16"<br>(for connection bolts) | <input type="checkbox"/> <b>Sandpaper (80 grit)</b> |
| <input type="checkbox"/> <b>25' Tape Measure</b>                             | <input type="checkbox"/> <b>Hack Saw</b>            |
| <input type="checkbox"/> <b>Sealing Kit</b>                                  | <input type="checkbox"/> <b>Level</b>               |
| <input type="checkbox"/> <b>Bonding (Epoxy) Kit(s)</b>                       | <input type="checkbox"/> <b>Stir Sticks</b>         |
|  | <input type="checkbox"/> <b>"C" Clamps</b>          |

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

## QUICK TIPS FOR INSTALLING LADDERS



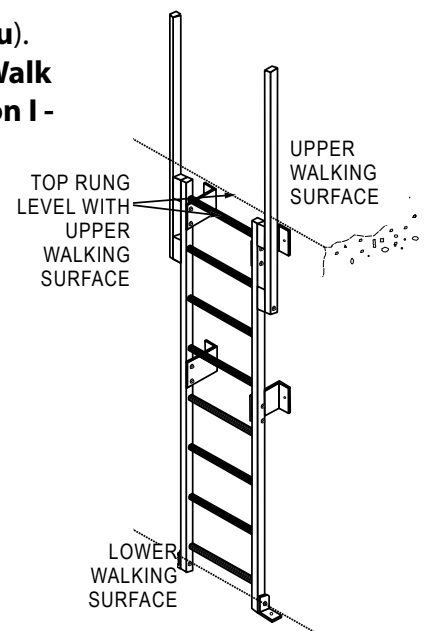
1. Layout ladder, walk thru, wall mount kits and floor mount kits. Cut ladder as required (see **Section I - Installing Ladder and Walk thru**). Attach walk thru to ladder (see **Section I - Installing Ladder and Walk thru**). Attach wall mounts to ladder and mount on wall (see **Section I - Installing 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.

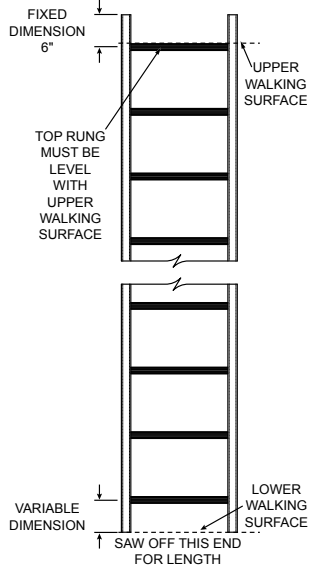
The installer could be liable for claims that result from improper installation.

**DRAWING A -  
INSTALLED LADDER**



# Section I - Installing Ladder

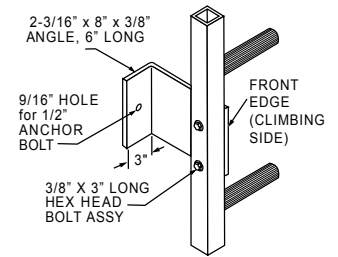
**DRAWING B - VARIABLE & FIXED DIMENSIONS**



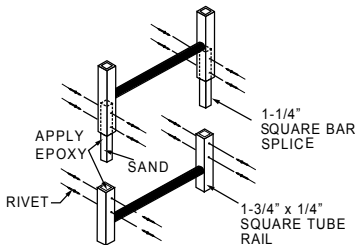
**INSTALLING LADDER AND WALK THRU**

1. Determine required ladder height by measuring from walking surface at bottom of ladder to step-off at top of ladder. Add 6" 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 8'-5" and you are working with a 10' ladder, be sure 6 inches are left from the step-off rung to the top and cut 1'-7" from the opposite end (see **Drawing B**).
2. If installing the 24" wide walk thru, place top spacer of one walk thru post as shown in **Drawing D**, 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 - STANDARD WALL MOUNT**



**DRAWING C - LADDER RAIL SPLICE**

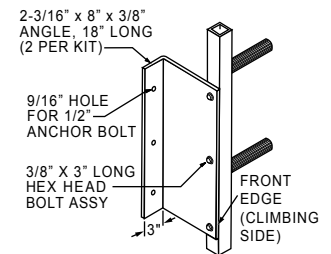


**INSTALLING WALL MOUNT BRACKETS**

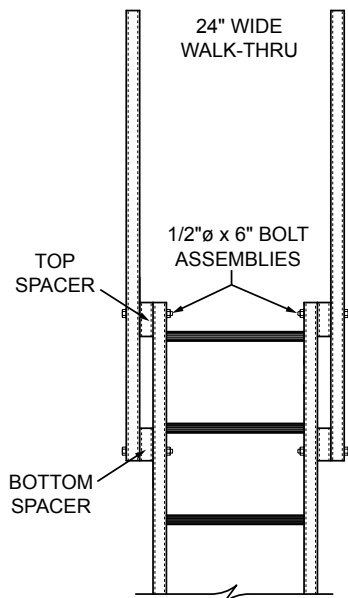
*Note: Maximum 6' spacing between brackets and maximum 6' from bottom end of ladder to first bracket. Ladder must be attached to wall or structure at the top rung.*

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 E**). Match drill two 7/16" diameter holes in ladder rail and bolt bracket to ladder with 3/8" x 3" 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.

**DRAWING F - BOTTOM WALL MOUNT**



**DRAWING D - 24" WIDE WALK THRU WITH SPACERS**

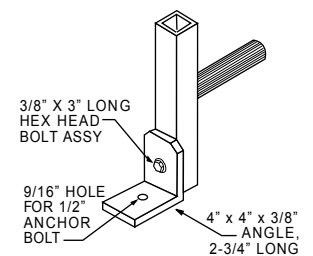


**INSTALLING FLOOR MOUNT CLIPS**

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

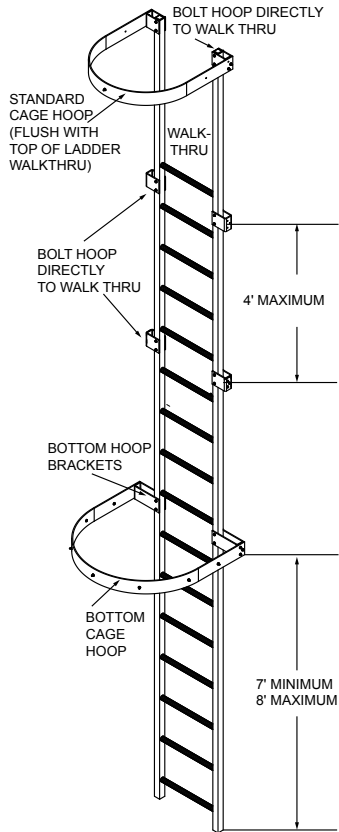
7. Place the floor clip flush with bottom of ladder rail, mark holes in bottom of ladder rail and drill a 7/16" diameter hole (**Drawing G**). Repeat for opposite rail. Bolt floor clips to ladder with 3/8" x 3" hex head bolt assemblies.
8. Drill floor for anchor bolts.
9. Bolt ladder to floor (**Drawing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

**DRAWING G - FLOOR MOUNT**



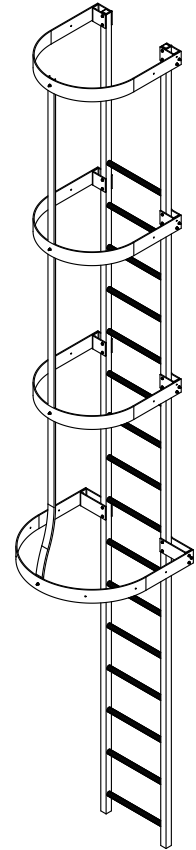
# Section II - Cage Installation

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

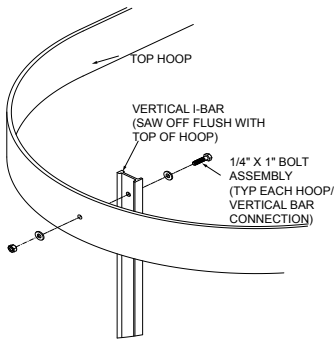


1. At the top of the 24" walk thru, attach the top cage hoop directly to the walk thru rails using 1/4" x 2-1/2" round head bolts (**Drawing H**). Install the remaining hoops using standard cage hoop brackets as described below.
2. Using standard cage hoop brackets as templates, drill 5/16" diameter mounting holes through the ladder rail. Bolt top hoop brackets to the ladder using the 1/4" x 3" 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 H**). Bottom hoop bracket should be 7' minimum, 8' maximum from walking surface at bottom of ladder. **Remember, hoops should be maximum 4' 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" 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" bolt assemblies provided (**Drawing H**).
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" diameter hole, and bolting with the 1/4" x 1" long bolt with two flat washers and hex nut (**Drawing I**). Continue with the remaining hoops (**Drawing K**). (If vertical bars are not long enough, splice per **Drawing J**). 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 L**).

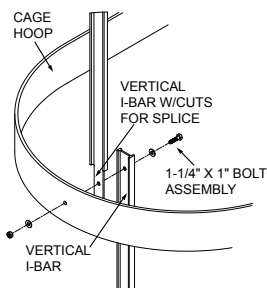
**DRAWING K - VERTICAL BAR INSTALLED**



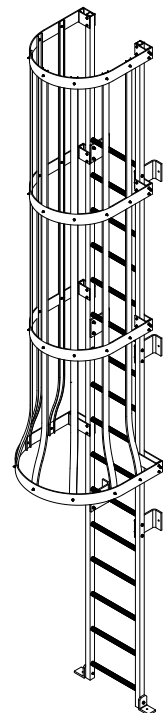
**DRAWING I - VERTICAL I-BAR CONNECTION**



**DRAWING J - VERTICAL I-BAR SPLICE**



**DRAWING L - INSTALLED LADDER WITH CAGE**



# Section III - Technical Information

## SUMMARY OF KEY OSHA REQUIREMENTS FOR LADDERS & LADDER SAFETY SYSTEMS

From the Code of Federal Regulations, Title 29, Labor, 1910.23 'Ladders', 1910.28 'Duty to Have Fall Protection...', and 1910.29 'Fall Protection Systems'

*The designer and installer are responsible for compliance with the most current OSHA code. You are urged to review all relevant rules prior to installing your ladder. (www.osha.gov)*

- 1910.23(b)(2) Ladder rungs, steps, and cleats are spaced not less than 10 inches (25 cm) and not more than 14 inches (36 cm) apart, as measured between the centerlines of the rungs, cleats, and steps...
- 1910.23(b)(4) Ladder rungs, steps, and cleats have a minimum clear width of ... 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders...
- 1910.23(d)(1) Fixed ladders are capable of supporting their maximum intended load (*Fiberglass Ladders are designed for up to 1100 lb total load*)
- 1910.23(d)(2) The minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder is 7 inches (18 cm)...
- 1910.23(d)(5) For through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches (61 cm) and not more than 30 inches (76 cm) of clearance. When a ladder safety system is provided, the maximum clearance between side rails of the extension must not exceed 36 inches (91 cm)
- 1910.28(b)(9)(i) For fixed ladders that extend more than 24 feet (7.3 m) above a lower level, the employer must ensure:
- 1910.28(b)(9)(i)(A) Existing fixed ladders. Each fixed ladder installed before November 19, 2018 is equipped with a personal fall arrest system, ladder safety system, cage, or well;
- 1910.28(b)(9)(i)(B) New fixed ladders. Each fixed ladder installed on and after November 19, 2018, is equipped with a personal fall arrest system or a ladder safety system;
- 1910.28(b)(9)(i)(C) Replacement. When a fixed ladder, cage, or well, or any portion of a section thereof, is replaced, a personal fall arrest system or ladder safety system is installed in at least that section of the fixed ladder, cage, or well where the replacement is located; and
- 1910.28(b)(9)(i)(D) Final deadline. On and after November 18, 2036, all fixed ladders are equipped with a personal fall arrest system or a ladder safety system.
- 1910.29(i)(6) Ladder safety systems and their support systems are capable of withstanding, without failure, a drop test consisting of an 18-inch (41-cm) drop of a 500-pound (227-kg) weight.

*Dynaform ladders have been independently tested to ANSI 14.3 static and dynamic load requirements for ladder safety devices using the Miller Safe-T-Climb system. Testing proved that the Dynaform ladder/Safe-T-Climb combination meets the load requirements for ladder safety systems as outlined in the OSHA rules. The test report is available at <http://fiberglass.com/media/366023/dynarail-ladder-performance-test.pdf>.*

*The new OSHA rules transition fixed ladder fall protection requirements from the use of ladder cages to the use of ladder safety systems such as the Miller Safe-T-Climb as described above. After November 19, 2018, cages alone are not adequate to meet the OSHA requirements for fall protection for the installation of new ladders and a ladder safety system must be installed. However, it may still be desirable to install ladder cages for other reasons, such as protecting the climber from objects near the ladder. It is for this reason that Fiberglass will continue to offer cages as an option for Dynaform ladders.*

## TECHNICAL DATA

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

### LADDER:

Maximum length without splice	24'-0"	Rung Spacing (center to center)	12"	Rail - outside width	1-3/4"
Clear inside width (inside rail to rail)	18"	Outside Diameter of rung	1-1/4"	Rail - wall thickness	1/4"
Outside width (outside rail to rail)	21-1/2"	Inside Diameter of rung	3/4"	Weight per foot (approximately)	3.0 lbs.

### CAGE:

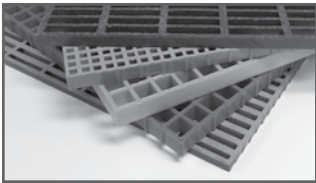
Product	Description
<b>Standard Hoop Kit</b> (PN 448200)	27" from center line of ladder rung to inside of hoop 3" wide x 1/4" thick hand layup Predrilled holes ( <i>with necessary bolt assemblies</i> )
<b>Bottom Hoop Kit</b> (PN 448000)	31" from center line of ladder rung to inside of hoop 3" wide x 1/4" thick hand layup Predrilled holes ( <i>with necessary bolt assemblies</i> )
<b>Hoop Brackets</b> (Included with hoop kits)	1/4" thick, "U" shaped hand layup Predrilled holes ( <i>with necessary bolt assemblies</i> )
<b>Vertical I-Bars</b> (PN 446211 - 10 ft; PN 446210 - 20 ft)	I-Bar, 1-1/2" deep x 5/8" flange x 1/8" 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>	2-3/16" x 8" x 3/8" angle, 18" 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 )	2-3/16" x 8" x 3/8" angle, 6" long 7" 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)	4" x 4" x 3/8" angle, 2-3/4" long Two per set ( <i>with necessary bolt assemblies</i> )

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



# Fibergrate Products & Services

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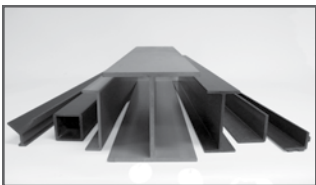
## Fibergrate® Molded Grating

Fibergrate molded gratings are designed to provide the ultimate in reliable performance, even in the most demanding conditions. Fibergrate offers the widest selection in the market with multiple resins and more than twenty grating configurations available in many panel sizes and surfaces.



## 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.



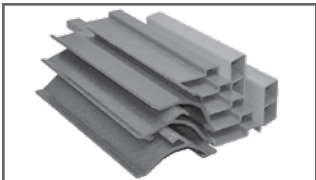
## Dynaform® Structural Shapes

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 & Ladders

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.



## Worldwide Sales & Distribution Network

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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Printed in the USA

