



MiTek
BUILDER PRODUCTS

Better Technology. Better Building.

**HF HARDY
FRAME**
SHEAR WALL SYSTEM

Table of Contents

| | |
|--|-------------------|
| Company Profile | 1 |
| Product Listings | 2-4 |
| General Information | 5 |
| Code Evaluations & Product Information | 6 |
| Notes to Specifier, Framer and General | 7 |
| Panels & Brace Frames | |
| On Foundation | 8 |
| Table 1.1A 2500,3000 and 4000 psi concrete | 9-21 |
| On Wood Sill Plate | 22 |
| Table 1.2 | 23-25 |
| On Raised Floor | 26 |
| Table 1.2A | 27-29 |
| On Upper Floor Systems | 30 |
| Table 1.3A | 31-33 |
| HFX/S - Steel Stud Heights | 34 |
| Table 2.1A 2500 psi concrete | 35-38 |
| Prescriptive Braced Walls | 39 |
| Design Examples | 40-41 |
| Photos | 42-43 |
| Accessories | |
| Post | 44 |
| Saddle | 45 |
| Template Kit Components | 46 |
| Back to Back Templates, Anchor Bolt Assemblies, T-Rods | 47 |
| Bolt Lever, Base Extension, Bearing Plate, Stacking Washer | 48 |
| Tension Connectors | 49 |
| Typical Details | |
| Panels | |
| HFX 1 - Anchorage | 50-51 |
| HFX 2 - Framing | 52-53 |
| HFX 3 - Floor Systems | 54-55 |
| Brace Frames | |
| HFX 4 - Foundation | 56-57 |
| HFX 5 - Framing | 58-59 |
| HFX 6 - Floor Systems | 60-61 |
| Hardy Frame Moment Frame | 62 |
| Retrofit Applications | |
| Moment Frame and Panel Installation | 63 |
| MiTek Builder Products | |
| Introduction / Product Line / Company Profile | 64 |
| USP Structural Connectors | 65 |
| Z4 Tie-Down System, Continuity Tie, Tension Tie | 66-67 |
| USP Screws, Plate Connectors, Straps | 68 |
| Hole Chart & Attachments | inside back cover |

Hardy Frames manufactures and markets the revolutionary Hardy Frame® shear wall system, and has been the leader in the pre-fabricated shear wall industry for over 15 years. The Hardy Frame® system allows Building Design Professionals to economically and safely minimize wall space and maximize wall openings while resisting high wind and earthquake loads.

The Hardy Frame® product line includes Panels, Brace Frames, Moment Frames, and various accessory items for installation. The new HFX design presented in this catalog has been tested per the ICC-ES Acceptance Criteria AC322, and has shown to provide excellent strength, excellent stiffness, and excellent ductility.

The original Hardy Frame® shear wall system was conceived and developed by Gary L. Hardy, a licensed General Contractor with over 25 years of framing experience. His vision was to develop a strong yet durable pre-fabricated shear wall solution that is cost effective, simple to install, and easy to inspect in order to eliminate the problems and hidden costs associated with site-built plywood shear walls.

From its inception the Hardy Frame® Shear Wall System has proven to be the leading innovator in it's category. In fact, the Hardy Frame® was the first to be recognized by ICBO-ES and LA City, the first to gain approval for multi-story applications, the first Balloon Wall application, and the first to be recognized to comply with the 2003 and 2006 IBC and IRC Building Codes. Our 9 inch Panel remains the narrowest prefabricated shear wall in the industry and we have now expanded our product line to include 15 and 21 inch widths.

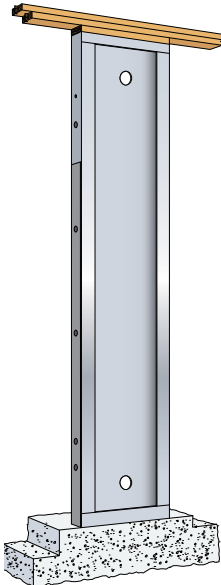
Hardy Frames is a wholly owned subsidiary of MiTek Industries, Inc., which is part of Warren Buffett's Berkshire Hathaway, Inc. By combining our talents with MiTek's manufacturing, engineering, and software expertise, we have amassed the resources to develop and offer the best products and services for our customers. The latest result of these efforts is the development of the HFX product line.

Our mission remains to provide you with the safest and most cost effective solutions to all of your shear and wall bracing challenges. We strive to accomplish this by adopting a process of constant improvement – continuously seeking ways to improve our operations, our products, and our services.

All of the Hardy Frame® products are conveniently available through local lumber yards and building hardware suppliers. Please contact us today to discover how the Hardy Frame® shear wall system can provide you with the Best Value solutions to your shear and wall bracing needs.

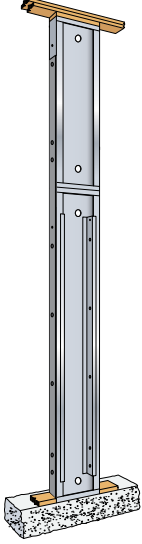
For more information, please call us at 800-754-3030 or visit our website at www.hardyframe.com

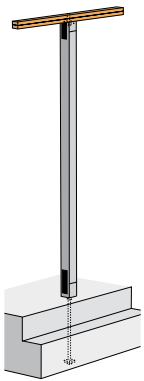


| | HFX Model Number | W (in) | H (in) | Depth (in) | Wt (lbs) | Minimum Screw Qty @ Top (ea) | Minimum Screw Qty @ Bottom (ea) | Screw Holes Available @ Edges (ea) |
|--|------------------|---------|---------|------------|----------|------------------------------|---------------------------------|------------------------------------|
|  <p>Panel 9 in. thru 24 in. widths</p> | HFX-9x79.5 | 9 | 79-1/2 | 3-1/2 | 77 | 5 | NA | 4 |
| | HFX-12x78 | 12 | 78 | | 90 | 6 | 6 | |
| | HFX-15x78 | 15 | | | 101 | 8 | 8 | |
| | HFX-18x78 | 18 | | | 113 | 10 | 10 | |
| | HFX-21x78 | 21 | | | 133 | 12 | 12 | |
| | HFX-24x78 | 24 | | | 148 | 14 | 14 | |
| | HFX-9x8 | 9 | | | 93-3/4 | 90 | 5 | NA |
| | HFX-12x8 | 12 | 92-1/4 | | 106 | 6 | 6 | |
| | HFX-15x8 | 15 | | | 118 | 8 | 8 | |
| | HFX-18x8 | 18 | | | 131 | 10 | 10 | |
| | HFX-21x8 | 21 | | | 157 | 12 | 12 | |
| | HFX-24x8 | 24 | | | 172 | 14 | 14 | |
| | HFX-32x8 | 32 | | | 92-1/4 | 143 | 10 | 10 |
| | HFX-44x8 | 44 | 174 | | | 14 | 14 | |
| | HFX-12x9 | 12 | 104-1/4 | | 116 | 6 | 6 | 4 |
| | HFX-15x9 | 15 | | | 130 | 8 | 8 | |
| | HFX-18x9 | 18 | | | 144 | 10 | 10 | |
| | HFX-21x9 | 21 | | | 175 | 12 | 12 | |
| | HFX-24x9 | 24 | | | 190 | 14 | 14 | |
| | HFX-32x9 | 32 | | | 104-1/4 | 158 | 10 | |
| | HFX-44x9 | 44 | 190 | | | 14 | 14 | |
| | HFX-12x10 | 12 | 116-1/4 | | 128 | 6 | 6 | 5 |
| | HFX-15x10 | 15 | | | 143 | 8 | 8 | |
| | HFX-18x10 | 18 | | | 158 | 10 | 10 | |
| | HFX-21x10 | 21 | | | 195 | 12 | 12 | |
| | HFX-24x10 | 24 | | | 209 | 14 | 14 | |
| | HFX-32x10 | 32 | | | 116-1/4 | 173 | 10 | |
| | HFX-44x10 | 44 | 206 | | | 14 | 14 | |
| HFX-15x11 | 15 | 128-1/4 | 161 | 8 | 8 | 5 | | |
| HFX-18x11 | 18 | | 177 | 10 | 10 | | | |
| HFX-21x11 | 21 | | 218 | 12 | 12 | | | |
| HFX-24x11 | 24 | | 233 | 14 | 14 | | | |
| HFX-32x11 | 32 | | 128-1/4 | 188 | 10 | | 10 | NA |
| HFX-44x11 | 44 | | | 222 | 14 | | 14 | |
| HFX-15x12 | 15 | 140-1/4 | 174 | 8 | 8 | 6 | | |
| HFX-18x12 | 18 | | 190 | 10 | 10 | | | |
| HFX-21x12 | 21 | | 235 | 12 | 12 | | | |
| HFX-24x12 | 24 | | 251 | 14 | 14 | | | |
| HFX-32x12 | 32 | | 140-1/4 | 203 | 10 | | 10 | NA |
| HFX-44x12 | 44 | | | 238 | 14 | | 14 | |
| HFX-15x13 | 15 | 152-1/4 | 187 | 8 | 8 | 6 | | |
| HFX-18x13 | 18 | | 203 | 10 | 10 | | | |
| HFX-21x13 | 21 | | 254 | 12 | 12 | | | |
| HFX-24x13 | 24 | | 269 | 14 | 14 | | | |
| HFX-32x13 | 32 | | 152-1/4 | 218 | 10 | | 10 | NA |
| HFX-44x13 | 44 | | | 254 | 14 | | 14 | |

Brace Frame
32 & 44 in. widths

For HFX/S Panel and Brace Frame model numbers (built to steel stud height) see product catalog page 35

| | HFX Model Number | W (in) | H (in) | Depth (in) | Wt (lbs) | Minimum Screw Qty @ Top (ea) | Minimum Screw Qty @ Bottom (ea) | Screw Holes Available @ Edges (ea) |
|---|------------------|---------|---------|------------|----------|------------------------------|---------------------------------|------------------------------------|
|  <p>Balloon Panel 15 in. thru 24 in widths 14 ft. thru 20 ft. heights</p> | HFX-15x14 | 15 | 164-1/4 | 3-1/2 | 223 | 8 | NA | 6 |
| | HFX-18x14 | 18 | | | 250 | 10 | | |
| | HFX-21x14 | 21 | | | 271 | 12 | | |
| | HFX-24x14 | 24 | | | 299 | 14 | | |
| | HFX-15x15 | 15 | 176-1/4 | | 240 | 8 | | |
| | HFX-18x15 | 18 | | | 267 | 10 | | |
| | HFX-21x15 | 21 | | | 291 | 12 | | |
| | HFX-24x15 | 24 | | | 320 | 14 | | |
| | HFX-15x16 | 15 | 188-1/4 | | 257 | 8 | | |
| | HFX-18x16 | 18 | | | 284 | 10 | | |
| | HFX-21x16 | 21 | | | 311 | 12 | | |
| | HFX-24x16 | 24 | | | 340 | 14 | | |
| | HFX-15x17 | 15 | 200-1/4 | | 274 | 8 | | |
| | HFX-18x17 | 18 | | | 301 | 10 | | |
| | HFX-21x17 | 21 | | | 331 | 12 | | |
| | HFX-24x17 | 24 | | | 361 | 14 | | |
| | HFX-15x18 | 15 | 212-1/4 | | 291 | 8 | | |
| | HFX-18x18 | 18 | | | 318 | 10 | | |
| | HFX-21x18 | 21 | | | 352 | 12 | | |
| | HFX-24x18 | 24 | | | 382 | 14 | | |
| HFX-15x19 | 15 | 224-1/4 | 308 | 8 | | | | |
| HFX-18x19 | 18 | | 335 | 10 | | | | |
| HFX-21x19 | 21 | | 373 | 12 | | | | |
| HFX-24x19 | 24 | | 402 | 14 | | | | |
| HFX-15x20 | 15 | 236-1/4 | 325 | 8 | | | | |
| HFX-18x20 | 18 | | 352 | 10 | | | | |
| HFX-21x20 | 21 | | 394 | 12 | | | | |
| HFX-24x20 | 24 | | 422 | 14 | | | | |
| | | | | | | | | 7 |
| | | | | | | | | 8 |

| | HFP Model Number | W (in) | H (in) | Depth (in) | Wt (lbs) | Rod Dia. @ Top (in) | Rod Dia. @ Bottom (in) | Screw Holes @ Edges (ea) |
|--|------------------|--------|----------|------------|----------|---------------------|------------------------|--------------------------|
|  <p>Post</p> | HFP8-7/8 | 3-1/2" | 92-1/4" | 3-1/2" | 42 | 7/8 | 7/8 | NA |
| | HFP8-1 1/8 | | 104-1/4" | | | 1-1/8 | 1-1/8 | |
| | HFP9-7/8 | | | | 116-1/4" | 47 | 7/8 | |
| | HFP9-1 1/8 | | 1-1/8 | | | 1-1/8 | | |
| | HFP10-7/8 | | 128-1/4" | | 52 | 7/8 | 7/8 | |
| | HFP10-1 1/8 | | | | | 1-1/8 | 1-1/8 | |
| | HFP11-7/8 | | 140-1/4" | | 57 | 7/8 | 7/8 | |
| | HFP11-1 1/8 | | | | | 1-1/8 | 1-1/8 | |
| | HFP12-7/8 | | 152-1/4" | | 62 | 7/8 | 7/8 | |
| | HFP12-1 1/8 | | | | | 1-1/8 | 1-1/8 | |
| | HFP13-7/8 | | | | 67 | 7/8 | 7/8 | |
| | HFP13-1 1/8 | | | | | 1-1/8 | 1-1/8 | |

Ordering Information

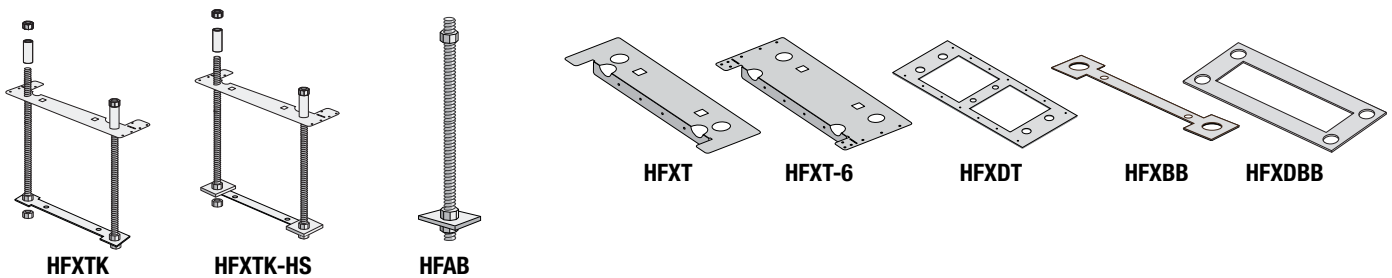
- 1) For Panels, adding "STK" after the model number indicates HFX Stacking Panels with built-in HFSW-Stacking Washers inside the top channel.
- 2) HFX/S models (not shown) are fabricated to standard steel stud heights of 96-5/8" 108-5/8" etc.
- 3) Custom heights are available for Panels, Brace Frames and Posts not to exceed the maximum height listed for that product.
- 4) Model number HFX-9x79.5, HFX-12x78, HFX-15x78, HFX-18x78, HFX-21x78 and HFX-24x78 Panels come with two straps welded to the solid face.
- 5) All models can be ordered custom with welded straps on either face.
- 5) For Post, order with 1-1/8 Dia Rods when connecting to Panels, 7/8 Dia for Brace Frames.

Connector Information

- 1) Screws are 1/4-inch diameter USP-WS (ESR-2761) or equal with a minimum allowable design value of 418 lbs. (excluding any duration of load stress increase) based on connecting metal (No. 12 gage) to wood (specific gravity of 0.50 or greater).
- 2) Screws at top are 3-inches when attaching directly to the collector. When installing a 2x wood filler (specific gravity of 0.5 or greater) at the top connection, the minimum screw length is 4-1/2 inches.
- 3) Screws at bottom (when applies) are 4-1/2 inches at Panel and Brace Frame connections, 3-inches (minimum) at Hardy Frame® Bearing Plate.
- 4) 1/4" diameter edge screws to adjacent framing are required when installing fillers above greater than 1-1/2" or when specified by the Building Design Professional.

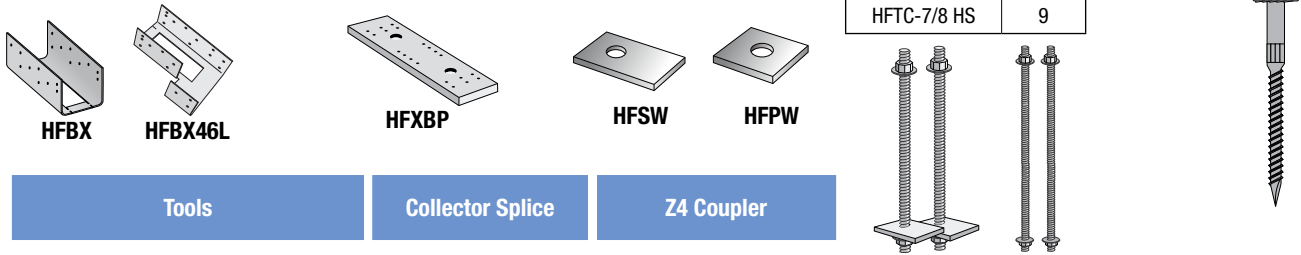
Anchorage

| Template Kits | | Anchor Bolt Assemblies | | Templates | | | | | | Bolt Braces | | | | | |
|-----------------------|----------|------------------------|----------|-------------------------|----------|--------|----------|-----------------------|----------|--------------|----------|---------|----------|--------------|----------|
| STD Rods ¹ | Wt (lbs) | HS Rods ² | Wt (lbs) | Panels ^{1,2,3} | Wt (lbs) | Single | Wt (lbs) | Single For 6" Framing | Wt (lbs) | Back to Back | Wt (lbs) | Single | Wt (lbs) | Back to Back | Wt (lbs) |
| HFXTK9 | 20 | HFXTK-HS9 | 26 | HFAB1-1/8x36STD | 10.5 | HFXT9 | 0.7 | HFXT9-6 | 1.0 | HFXT9 | 2.0 | HFxBB9 | 0.3 | HFxDBB9 | 0.3 |
| HFXTK12 | 20 | HFXTK-HS12 | 26 | HFAB1-1/8x48STD | 13.5 | HFXT12 | 0.9 | HFXT12-6 | 1.2 | HFXT12 | 2.2 | HFxBB12 | 0.4 | HFxDBB12 | 0.4 |
| HFXTK15 | 21 | HFXTK-HS15 | 26 | HFAB1-1/8x60STD | 16.3 | HFXT15 | 1.2 | HFXT15-6 | 1.5 | HFXT15 | 2.5 | HFxBB15 | 0.5 | HFxDBB15 | 0.5 |
| HFXTK18 | 21 | HFXTK-HS18 | 27 | HFAB1-1/8x72STD | 18.9 | HFXT18 | 1.4 | HFXT18-6 | 1.7 | HFXT18 | 2.8 | HFxBB18 | 0.6 | HFxDBB18 | 0.6 |
| HFXTK21 | 21 | HFXTK-HS21 | 27 | HFAB1-1/8x36HS | 10.8 | HFXT21 | 1.7 | HFXT21-6 | 1.0 | HFXT21 | 3.3 | HFxBB21 | 0.7 | HFxDBB21 | 0.7 |
| HFXTK24 | 22 | HFXTK-HS24 | 28 | HFAB1-1/8x48HS | 13.5 | HFXT24 | 1.9 | HFXT24-6 | 1.2 | HFXT24 | 3.8 | HFxBB24 | 0.8 | HFxDBB24 | 0.8 |
| HFXTK32 | 16 | HFXTK-HS32 | 18 | HFAB1-1/8x60HS | 16.4 | HFXT32 | 3.2 | HFXT32-6 | 3.5 | HFXT32 | 5.1 | | | | |
| HFXTK44 | 17 | HFXTK-HS44 | 19 | HFAB1-1/8x72HS | 19.3 | HFXT44 | 4.2 | HFXT44-6 | 4.5 | HFXT44 | 6.4 | | | | |

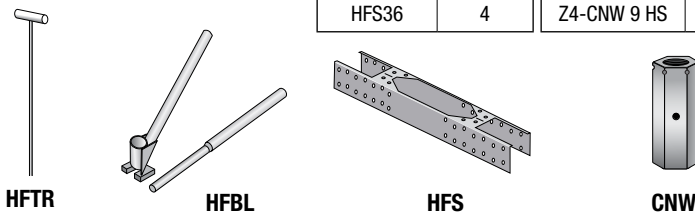


Bottom and Top Connectors

| Base Extensions | | Bearing Plates & Stacking Washers | | | Tension Connector Kits | | Shear Transfer | | | |
|-----------------|----------|-----------------------------------|----------|--|------------------------|-----------------------|----------------|-----------------|-------------|---------|
| HFBX | Wt (lbs) | Bearing Plates | Wt (lbs) | Stacking Washers ⁴ Plate Washers | Wt (lbs) | Rods ^{1,2,4} | Wt (lbs) | USP Wood Screws | Size | Box Qty |
| HFBX | 2 | HFxBP12 (Length = 18") | 13 | HFSW12 | 1.5 | HFTC12 STD | 15 | WS3-HF | 1/4 x 3 | 30 |
| HFBX46-L | 2.5 | HFxBP15 (Length = 21") | 15 | HFSW15-24 | 2.8 | HFTC15-24 STD | 20 | WS45-HF | 1/4 x 4 1/2 | 30 |
| HFBX46-R | 2.5 | HFxBP18 (Length = 24") | 17 | HFPW 7/8 | 1 | HFTC-7/8 STD | 9 | | | |
| HFBX66-L | 3 | HFxBP21 (Length = 27") | 19 | HFPW 1-1/8 | 1 | HFTC12 HS | 18 | | | |
| HFBX66-R | 3 | HFxBP24 (Length = 30") | 21 | | | HFTC15-24 HS | 21 | | | |
| | | | | | | HFTC-7/8 HS | 9 | | | |



| Tools | | | | Collector Splice | | Z4 Coupler | |
|-------|----------|------------|----------|------------------|----------|-------------|----------|
| T-Rod | Wt (lbs) | Bolt Lever | Wt (lbs) | Saddles | Wt (lbs) | CNW | Wt (lbs) |
| HFTR | 4 | HFBL | 21 | HFS24 | 3 | Z4-CNW 7 HS | 0.3 |
| | | | | HFS36 | 4 | Z4-CNW 9 HS | 0.5 |



Notes

- 1) STD Anchor Bolts are ASTM F1554 Grade 36.
- 2) HS Anchor Bolts are ASTM A193 Grade B7.
- 3) HFAB anchor bolt assemblies also available in 7/8" diameter for Brace Frames.
- 4) HFSW12 and HFTC12 apply to 12 inch Panel widths. HFSW15-24 and HFTC15-24 apply to 15, 18, 21 and 24 inch Panel widths.

General Information

The Hardy Frame® HFX Panels and Brace Frames combine the most desirable properties for a shear wall: strength, stiffness, and ductility. This revolutionary system has been tested and evaluated under the ICC-Evaluation Service AC322 Acceptance Criteria, and has been proven to provide the highest allowable shear loads in the industry combined with abundant ductility for a seismic "R" value of 6.5. Along with its superior engineering properties, the HFX system is easier than ever to install, is code listed for varied installations including on floor systems and stacking conditions with practical anchorage solutions for standard as well as high strength hold down rods.

Features presented in this catalog include:

- Allowable values for installations on 2500, 3000, and 4000 psi concrete are combined in one table.
- The allowable design values in this catalog have been increased in accordance with the 2012 IBC Code.
- Anchorage details have been revised.
- Includes reinforced anchorage solutions for single and back-to-back Panel installations.
- New accessories including templates for 2x6 wall framing, back-to-back installations and WS-Series Screws.
- New anchor bolt assemblies for threaded rod lengths of 3, 4, 5, and 6 foot.
- Tables are resequenced by height.
- Examples of plan specifications are shown at the end of each section.

Hardy Frame® HFX Panels are available in widths of 9, 12, 15, 18, 21 and 24-inches and in heights that correspond to a standard portal (78-inches) and standard wood stud lengths. For slab or curb installations simply secure to the foundation with two 1-1/8-inch diameter hold down anchors and connect the top channel to a collector above with 1/4-inch diameter screws through pre-punched holes. No connections are required to the edges or to either face.

Hardy Frame® HFX Brace Frames are either 32 or 44-inches wide and as with Panels, are fabricated to standard wood stud lengths. Hold down anchors for Brace Frames are 7/8-inch diameter and may be either standard or high strength for increased allowable loads. Connections to the foundation require two 7/8-inch diameter standard grade hold down anchors. Top connections are accomplished with 1/4-inch diameter screws into the collector above. No other connections are required but field studs are provided for easy attachment of surface finishes with self tapping screws.



Code Evaluations:

For the most current code report listings refer to our website www.hardyframe.com.

Product Use:

The Hardy Frame® products are designed and manufactured for the specific purposes described in this catalog. Any changes to the products or in the installation procedures must be approved by the Building Design Professional and are the sole responsibility of the designer.

Quality Statement:

Hardy Frames warrants to its customers that its products are free from material defects of manufacture or design, and will perform in substantial accordance with published specifications, if properly used.

Testing:

Hardy Frames performs extensive testing on all of the Hardy Frame® structurally rated products. All final testing is conducted by a third party testing laboratory.

Material:

Hardy Frame® Panels, Brace Frames and Posts are manufactured from prime quality steel which meets the requirements of ASTM A653 SS Grade 50 steel and ASTM A36 hot-rolled steel built in at hold down connections.

Finish:

All galvanized steel has a minimum G60 hot-dipped galvanized zinc coating.

Threaded Rod/Hold Down Bolts

Unless noted otherwise the “STD” hold downs are ASTM F1554 grade 36, and the “HS” (high strength) are ASTM A193 grade B7 or equivalent.



Notes to the Specifier:

- The allowable loads shown in this catalog are based on Allowable Stress Design (ASD) methodology.
- The published allowable design loads for the Hardy Frame® Panels and Brace Frames are based on calculations and testing.
- For the Hardy Frame® Panels and Brace Frames, the allowable design loads may change depending on the type of support below. Please be sure to refer to the proper table and installation details for accurate load values and proper installation.
- Please be clear as to the surface you want the Hardy Frame® Panel or Brace Frame to be installed on i.e.: on concrete, mudsill, etc.
- For a combination of over-turning and gravity loads the specifier must review and check the bearing pressure on the structure below.
- The allowable design values for the Hardy Frame® Panels and Brace Frames shown in these tables are for the 2012 IBC code.

Notes to the Framers:

- Install all specified fasteners in accordance with the instructions of this catalog.
- When necessary, all field welding should be done in accordance with A.W.S. standards.
WARNING: Welding galvanized steel may produce harmful fumes and should be performed in well-ventilated environments. Follow proper welding procedures and safety precautions.
- Washers are required under the head or nut of all bolted connections.
- Please refer to the proper installation specifications and details as provided in the plans.

General Notes:

- Hardy Frames reserves the right to change specifications, designs, and models without notice and liability of such changes.
- The information presented in this catalog supercedes all information published in previous documents and publications.
- This catalog is designed as a general reference for the Hardy Frame® products. For more specific and most up to date information, please visit our website at hardyframe.com or contact us directly at 800-754-3030.
- For installations involving unusual or extreme applications and conditions, please contact Hardy Frames at 800-754-3030.
- This catalog may not be reproduced in whole or in part without the written permission of Hardy Frames.

CUSTOMER SERVICE

Hardy Frame premanufactured shear walls are our core business. From the beginning, customer service has been a top priority. Because we are focused on shear walls and have a strong commitment to service, we can provide you with the best support in the industry.

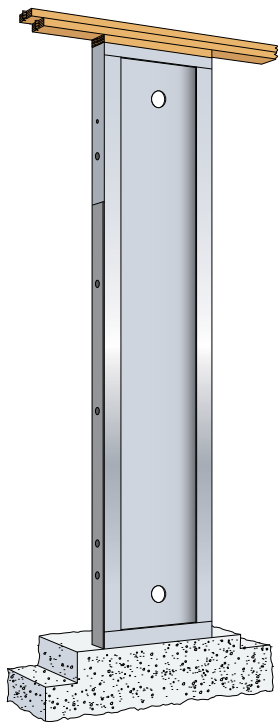
To the Design Professional this means prompt and correct technical answers and full design solutions that are backed by extensive testing and research. From providing allowable design loads to addressing specific repairs you can always count on our answers.

To the Building Official, our Code Reports and Typical Installation Details will make the plan check process and field inspection easier.

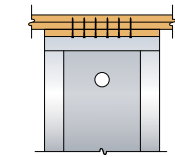
To the Installer, our background and knowledge in framing and construction allows us to communicate with the field and have an understanding of the installation from the point of view of the installer. Quick responses are a must and project delays are avoided at all costs. Help is available by telephone, or by one of our many field representatives with real field experience.

To all parties, in addition to literature, details and telephone support, our company provides jobsite visits, seminars, and personal training sessions. We respond to our customers and you can rest assured that we will be there for you when you need us.

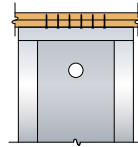
How can we help you today?



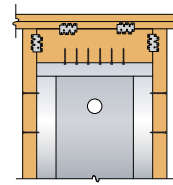
PANEL



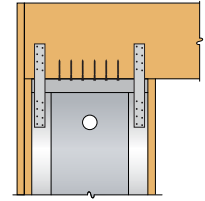
2x Filler
1/4 x 4 1/2" Screws



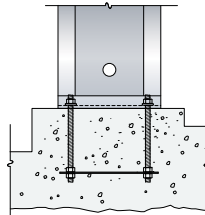
Top Plates
1/4 x 3" Screws



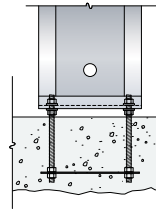
4x Filler
1/4 x 3" Screws



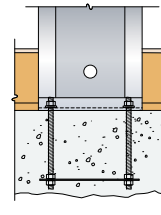
Portal
1/4 x 3" Screws. 78 Inch
Panel Heights Include
Welded Straps



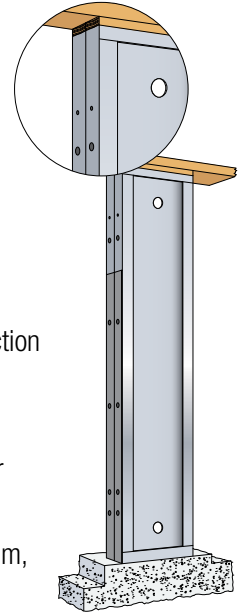
Concrete Bearing



Nuts And Washers
(Requires 5,000 psi
Non-Shrink Grout)

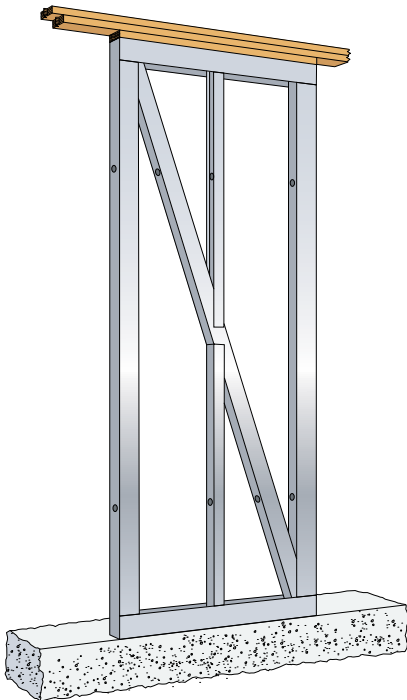


**Raised Floor
Head Out**

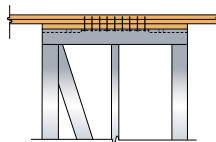


- Installation on nuts and washers provides for leveling at uneven concrete - open end box wrench may be used to secure connection from below
- Raised floor head out by passes wood framing to eliminate the effects of shrinkage and crushing, while providing a direct shear transfer to the foundation
- Raised floor head out requires less material by eliminating the rim, bearing plate and bottom screws
- The new HFX Brace Frame has relocated hold down bolts to be outside of the post. Hold down connections are now accessible even when wood or framing is in contact with the edge of the frame
- With proper detailing and anchorage "Back to Back" installations provide two times the allowable shear value without increasing the wall width

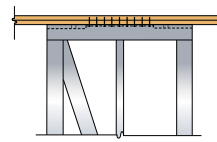
"Back to Back"
*installations provide two
times the allowable shear
value*



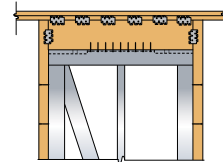
BRACE FRAME



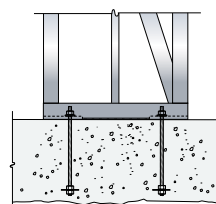
2x Filler
1/4 x 4 1/2" Screws



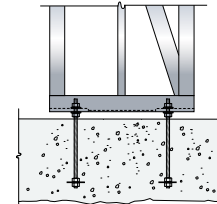
Top Plates
1/4 x 3" Screws



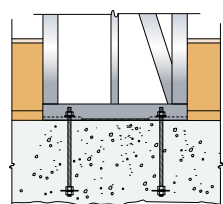
4x Filler
1/4 x 3" Screws



Concrete Bearing



Nuts And Washers
(Requires 5,000 psi
Non-Shrink Grout)



**Raised Floor
Head Out**

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-9x79.5 | 79 1/2 | 2,500 | 1 1/8" STD | 2,000 | 905 | 0.186 | 15,510 | 905 | 0.186 | 15,510 |
| | | 3,000 | | | 1,100 | 0.226 | 19,220 | 1,100 | 0.226 | 19,220 |
| | | 4,000 | | | 1,350 | 0.276 | 21,435 | 1,350 | 0.276 | 21,435 |
| HFX-12x78 | 78 | 2,500 | 1 1/8" STD | 1,000 | 1,750 | 0.193 | 19,595 | 1,750 | 0.193 | 19,595 |
| | | | | 3,500 | 1,610 | 0.178 | 17,005 | 1,610 | 0.178 | 17,005 |
| | | | | 6,500 | 1,440 | 0.159 | 14,325 | 1,440 | 0.159 | 14,325 |
| | | | 1 1/8" HS | 1,000 | 1,750 | 0.194 | 19,595 | 1,750 | 0.194 | 19,595 |
| | | | | 3,500 | 1,610 | 0.179 | 17,005 | 1,610 | 0.179 | 17,005 |
| | | | | 6,500 | 1,440 | 0.160 | 14,325 | 1,440 | 0.160 | 14,325 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,000 | 0.221 | 21,575 | 2,000 | 0.221 | 21,575 |
| | | | | 3,500 | 1,970 | 0.218 | 21,075 | 1,970 | 0.218 | 21,075 |
| | | | | 6,500 | 1,810 | 0.200 | 18,375 | 1,810 | 0.200 | 18,375 |
| | | | 1 1/8" HS | 1,000 | 2,110 | 0.234 | 23,750 | 2,110 | 0.234 | 23,750 |
| | | | | 3,500 | 1,970 | 0.219 | 21,075 | 1,970 | 0.219 | 21,075 |
| | | | | 6,500 | 1,810 | 0.201 | 18,375 | 1,810 | 0.201 | 18,375 |
| | | 4,000 | 1 1/8" STD | 1,000 | 2,210 | 0.245 | 21,620 | 2,210 | 0.244 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 2,830 | 0.314 | 32,065 | 2,830 | 0.314 | 32,065 |
| | | | | 3,500 | 2,695 | 0.299 | 29,275 | 2,695 | 0.299 | 29,275 |
| | | | | 6,500 | 2,530 | 0.281 | 26,380 | 2,530 | 0.281 | 26,380 |
| HFX-15x78 | 78 | 2,500 | 1 1/8" STD | 1,000 | 2,425 | 0.252 | 21,615 | 2,425 | 0.251 | 21,615 |
| | | | | 3,500 | 2,405 | 0.251 | 21,380 | 2,405 | 0.250 | 21,380 |
| | | | | 6,500 | 2,350 | 0.245 | 20,560 | 2,350 | 0.244 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 2,855 | 0.298 | 31,340 | 2,855 | 0.298 | 31,340 |
| | | | | 3,500 | 2,675 | 0.279 | 26,150 | 2,675 | 0.279 | 26,150 |
| | | | | 6,500 | 2,425 | 0.252 | 21,625 | 2,425 | 0.252 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,590 | 0.270 | 21,620 | 2,590 | 0.269 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,275 | 0.341 | 32,885 | 3,440 | 0.358 | 38,195 |
| | | | | 3,500 | 3,265 | 0.340 | 32,600 | 3,265 | 0.340 | 32,600 |
| | | | | 6,500 | 3,020 | 0.315 | 27,795 | 3,020 | 0.315 | 27,795 |
| | | 4,000 | 1 1/8" STD | 1,000 | 2,800 | 0.292 | 21,620 | 2,800 | 0.290 | 21,620 |
| | | | | 3,500 | 2,795 | 0.291 | 21,590 | 2,795 | 0.290 | 21,590 |
| | | | | 6,500 | 2,785 | 0.290 | 21,445 | 2,785 | 0.289 | 21,445 |
| | | | 1 1/8" HS | 1,000 | 3,275 | 0.341 | 26,695 | 4,160 | 0.433 | 39,380 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| HFX-18x78 | 78 | 2,500 | 1 1/8" STD | 1,000 | 3,050 | 0.185 | 19,725 | 3,195 | 0.193 | 21,055 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 4,425 | 0.269 | 39,500 | 4,425 | 0.269 | 39,500 |
| | | | | 3,500 | 4,195 | 0.255 | 33,700 | 4,195 | 0.255 | 33,700 |
| | | | | 6,500 | 3,885 | 0.236 | 28,745 | 3,885 | 0.236 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 3,050 | 0.185 | 18,635 | 3,305 | 0.200 | 20,645 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 4,660 | 0.283 | 34,455 | 4,660 | 0.283 | 34,455 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 4,000 | 1 1/8" STD | 1,000 | 3,050 | 0.185 | 17,585 | 3,450 | 0.209 | 20,335 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 4,660 | 0.283 | 29,645 | 4,660 | 0.283 | 29,645 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| HFX-21x78 | 78 | 2,500 | 1 1/8" STD | 1,000 | 3,805 | 0.198 | 19,685 | 3,805 | 0.198 | 19,685 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 6,005 | 0.315 | 40,495 | 6,230 | 0.327 | 44,825 |
| | | | | 3,500 | 6,005 | 0.315 | 40,495 | 6,040 | 0.317 | 41,070 |
| | | | | 6,500 | 5,690 | 0.299 | 36,045 | 5,690 | 0.299 | 36,045 |
| | | 3,000 | 1 1/8" STD | 1,000 | 3,925 | 0.204 | 19,585 | 3,925 | 0.204 | 19,585 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 6,005 | 0.315 | 34,645 | 6,875 | 0.361 | 43,835 |
| | | | | 3,500 | | | | 6,800 | 0.357 | 42,865 |
| | | | | 6,500 | | | | 6,680 | 0.351 | 41,480 |
| | | 4,000 | 1 1/8" STD | 1,000 | 4,075 | 0.212 | 19,460 | 4,075 | 0.212 | 19,460 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 6,005 | 0.315 | 30,985 | 7,295 | 0.383 | 40,220 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | | | | | | | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|--------|-------|-------|--------|-------|-------|--------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | | | | | | | |
| HFX-24x78 | 78 | 2,500 | 1 1/8" STD | 1,000 | 3,830 | 0.123 | 15,985 | 4,345 | 0.140 | 18,570 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | 1 1/8" HS | 1,000 | 6,990 | 0.227 | 35,310 | 7,605 | 0.246 | 40,940 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| | 3,000 | 1 1/8" STD | 1,000 | 3,830 | 0.123 | 15,565 | 4,465 | 0.143 | 18,540 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 6,990 | 0.227 | 32,375 | 8,365 | 0.271 | 42,200 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 3,830 | 0.123 | 15,095 | 4,620 | 0.148 | 18,540 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 6,990 | 0.227 | 29,900 | 8,490 | 0.275 | 38,125 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| HFX-9x8 | 93 3/4 | 2,500 | 1 1/8" STD | 2,000 | 770 | 0.258 | 15,510 | 770 | 0.258 | 15,510 | | | | | | | |
| | | 3,000 | | | 935 | | | 0.314 | | | 19,220 | 935 | 0.314 | 19,220 | | | |
| | | 4,000 | | | 1,040 | | | 0.349 | | | 18,235 | 1,145 | 0.384 | 21,435 | | | |
| HFX-12x8 | 92 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,480 | 0.223 | 19,595 | 1,480 | 0.224 | 19,595 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | 1,365 | 0.206 | 17,005 | 1,365 | 0.206 | 17,005 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,690 | 0.255 | 21,575 | 1,690 | 0.256 | 21,575 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | 1,665 | 0.252 | 21,075 | 1,665 | 0.252 | 21,075 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | 4,000 | 1 1/8" STD | 1,000 | 1,530 | 0.231 | 18,375 | 1,530 | 0.231 | 18,375 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| | | 1 1/8" HS | 1,000 | 1,780 | 0.271 | 23,750 | 1,780 | 0.271 | 23,750 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| HFX-15x8 | 92 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,050 | 0.311 | 21,620 | 2,050 | 0.309 | 21,620 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | | | 1 1/8" HS | | | | | | | 1,000 | 2,035 | 0.309 | 21,380 | 2,035 | 0.307 | 21,380 |
| | | | | | | | | | | | 3,500 | | | | | | |
| | | | | | | | | | | | 6,500 | | | | | | |
| 3,000 | 1 1/8" STD | 1,000 | 1,990 | 0.301 | 20,560 | 1,990 | 0.300 | 20,560 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 2,415 | 0.366 | 31,340 | 2,415 | 0.366 | 31,340 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,260 | 0.343 | 26,150 | 2,260 | 0.343 | 26,150 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 2,050 | 0.311 | 21,625 | 2,050 | 0.311 | 21,625 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| HFX-18x8 | 92 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,695 | 0.224 | 20,985 | 2,750 | 0.228 | 21,615 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,740 | 0.312 | 39,500 | 3,740 | 0.313 | 39,500 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| | 3,000 | 1 1/8" STD | 1,000 | 3,550 | 0.296 | 33,700 | 3,550 | 0.297 | 33,700 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,285 | 0.274 | 28,745 | 3,285 | 0.275 | 28,745 | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,695 | 0.224 | 19,710 | 2,890 | 0.240 | 21,600 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 4,250 | 0.355 | 40,280 | 2,880 | 0.239 | 21,475 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 4,060 | 0.339 | 36,500 | 4,420 | 0.370 | 44,815 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | 2,695 | 0.224 | 18,510 | 3,040 | 0.252 | 21,345 | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | |
| 1 1/8" HS | 1,000 | 4,250 | 0.355 | 32,890 | 3,025 | 0.251 | 21,230 | | | | | | | | | | |
| | 3,500 | | | | | | | | | | | | | | | | |
| | 6,500 | | | | | | | | | | | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | | | | | | | | | | | | | | | | | | | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|--------|-------|--------|--------|-------|--------|--------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | | | | | | | | | | | | | | | | | | | |
| HFX-21x8 | 92 1/4 | 2,500 | 1 1/8" STD | 1,000 | 3,355 | 0.254 | 20,795 | 3,355 | 0.254 | 20,795 | | | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | | | 5,080 | 0.388 | 40,495 | 5,270 | 0.402 | 44,825 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 3,430 | 0.260 | 20,395 | 3,430 | 0.260 | 20,395 | | | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | | | 5,080 | 0.388 | 34,645 | 5,955 | 0.455 | 46,095 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 3,555 | 0.269 | 20,175 | 3,555 | 0.269 | 20,175 | | | | | | | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | | | | | | | 5,080 | 0.388 | 30,985 | 6,170 | 0.471 | 40,220 | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HFX-24x8 | 92 1/4 | 2,500 | 1 1/8" STD | 1,000 | 3,420 | 0.151 | 17,045 | 3,860 | | | | | | | 0.171 | 19,700 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | 5,910 | 0.263 | 35,310 | 6,690 | 0.298 | 44,310 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 3,420 | 0.151 | 16,555 | 3,960 | | | | | | | 0.175 | 19,610 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | 5,910 | 0.263 | 32,375 | 7,175 | 0.320 | 43,185 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 4,000 | 1 1/8" STD | 1,000 | 3,420 | 0.151 | 16,020 | 4,085 | | | | | | | 0.181 | 19,500 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | 5,910 | 0.263 | 29,900 | 7,175 | 0.320 | 38,100 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| HFX-32x8 | 92 1/4 | 2,500 | 7/8" STD | 1,000 | 2,375 | 0.139 | 8,945 | 2,825 | | | | | | | 0.165 | 10,630 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7/8" HS | | | | | 1,000 | 3,000 | 0.176 | 11,295 | 3,000 | 0.176 | | | 11,295 | | | | | | | | | | | | |
| | | | | | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | |
| | | | 3,000 | 7/8" STD | | | | | 1,000 | | | | | | | | | 2,375 | 0.139 | 8,945 | 2,895 | 0.169 | 10,910 | | | | | | |
| | | | | | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | |
| | | | | 7/8" HS | | | | | 1,000 | | | | | | | | | | | | | | | 3,655 | 0.214 | 13,755 | 3,655 | 0.214 | 13,755 |
| | | | | | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | |
| | | 4,000 | 7/8" STD | 1,000 | 2,375 | 0.139 | 8,945 | 2,895 | 0.169 | | | | | | 10,910 | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 7/8" HS | 1,000 | | | | | | 4,390 | 0.257 | 16,530 | 4,870 | 0.285 | | 18,330 | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,500 | 7/8" STD | 1,000 | 2,950 | 0.094 | 7,610 | 3,660 | 0.117 | | | | | | 9,440 | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7/8" HS | | | | | | 1,000 | 4,510 | 0.144 | 11,645 | 4,510 | | 0.144 | 11,645 | | | | | | | | | | | | |
| | | | | | | | | | | 3,500 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 6,500 | | | | | | | | | | | | | | | | | | | |
| 3,000 | 7/8" STD | | | 1,000 | | | | | | 2,950 | | | | | | | | 0.094 | 7,610 | 3,660 | 0.117 | 9,440 | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7/8" HS | | | 1,000 | | | | | | | | | | | | | | | | | | | 5,490 | 0.175 | 14,175 | 5,490 | 0.175 | 14,175 | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4,000 | 7/8" STD | 1,000 | 2,950 | 0.094 | 7,610 | 3,660 | 0.117 | 9,440 | | | | | | | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7/8" HS | 1,000 | | | | | | | 5,655 | 0.180 | 14,590 | 6,405 | 0.204 | 16,530 | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2,500 | 7/8" STD | 1,000 | 2,950 | 0.094 | 7,610 | 3,660 | 0.117 | 9,440 | | | | | | | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 7/8" HS | | | | | | | 1,000 | 5,245 | 0.167 | 13,530 | 5,245 | 0.167 | 13,530 | | | | | | | | | | | | | | |
| | | | | | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-12x9 | 104 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,310 | 0.248 | 19,595 | 1,310 | 0.248 | 19,595 |
| | | | | 3,500 | 1,205 | 0.229 | 17,005 | 1,205 | 0.229 | 17,005 |
| | | | | 6,500 | 1,080 | 0.205 | 14,325 | 1,080 | 0.205 | 14,325 |
| | | | 1 1/8" HS | 1,000 | 1,310 | 0.250 | 19,595 | 1,310 | 0.250 | 19,595 |
| | | | | 3,500 | 1,205 | 0.230 | 17,005 | 1,205 | 0.230 | 17,005 |
| | | | | 6,500 | 1,080 | 0.206 | 14,325 | 1,080 | 0.206 | 14,325 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,475 | 0.280 | 21,065 | 1,495 | 0.284 | 21,575 |
| | | | | 3,500 | 1,475 | 0.280 | 21,065 | 1,475 | 0.280 | 21,075 |
| | | | | 6,500 | 1,355 | 0.257 | 18,375 | 1,355 | 0.257 | 18,375 |
| | | | 1 1/8" HS | 1,000 | 1,575 | 0.301 | 23,750 | 1,575 | 0.301 | 23,750 |
| | | | | 3,500 | 1,475 | 0.282 | 21,075 | 1,475 | 0.282 | 21,075 |
| | | | | 6,500 | 1,355 | 0.259 | 18,375 | 1,355 | 0.258 | 18,375 |
| 4,000 | 1 1/8" STD | 1,000 | 1,475 | 0.280 | 18,515 | 1,655 | 0.314 | 21,615 | | |
| | | 3,500 | 1,475 | 0.280 | 18,515 | 1,655 | 0.314 | 21,615 | | |
| | | 6,500 | 1,475 | 0.280 | 18,515 | 1,655 | 0.314 | 21,615 | | |
| | 1 1/8" HS | 1,000 | 1,680 | 0.321 | 22,085 | 2,115 | 0.404 | 32,065 | | |
| | | 3,500 | 1,680 | 0.321 | 22,085 | 2,015 | 0.385 | 29,275 | | |
| | | 6,500 | 1,680 | 0.321 | 22,085 | 1,890 | 0.361 | 26,380 | | |
| HFX-15x9 | 104 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,815 | 0.361 | 21,615 | 1,815 | 0.360 | 21,615 |
| | | | | 3,500 | 1,800 | 0.359 | 21,380 | 1,800 | 0.357 | 21,380 |
| | | | | 6,500 | 1,760 | 0.351 | 20,560 | 1,760 | 0.349 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 2,135 | 0.426 | 31,340 | 2,135 | 0.426 | 31,340 |
| | | | | 3,500 | 2,000 | 0.399 | 26,150 | 2,000 | 0.399 | 26,150 |
| | | | | 6,500 | 1,815 | 0.362 | 21,625 | 1,815 | 0.362 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,940 | 0.387 | 21,620 | 1,940 | 0.385 | 21,620 |
| | | | | 3,500 | 1,940 | 0.387 | 21,620 | 1,940 | 0.385 | 21,620 |
| | | | | 6,500 | 1,940 | 0.387 | 21,620 | 1,940 | 0.385 | 21,620 |
| | | | 1 1/8" HS | 1,000 | 2,285 | 0.456 | 28,390 | 2,575 | 0.513 | 38,195 |
| | | | | 3,500 | 2,285 | 0.456 | 28,390 | 2,440 | 0.487 | 32,600 |
| | | | | 6,500 | 2,260 | 0.451 | 27,795 | 2,260 | 0.451 | 27,795 |
| 4,000 | 1 1/8" STD | 1,000 | 2,095 | 0.418 | 21,615 | 2,095 | 0.416 | 21,615 | | |
| | | 3,500 | 2,095 | 0.418 | 21,615 | 2,095 | 0.416 | 21,615 | | |
| | | 6,500 | 2,095 | 0.418 | 21,615 | 2,095 | 0.416 | 21,615 | | |
| | 1 1/8" HS | 1,000 | 2,285 | 0.456 | 24,265 | 2,905 | 0.579 | 34,670 | | |
| | | 3,500 | 2,285 | 0.456 | 24,265 | 2,905 | 0.579 | 34,670 | | |
| | | 6,500 | 2,285 | 0.456 | 24,265 | 2,905 | 0.579 | 34,670 | | |
| HFX-18x9 | 104 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,435 | 0.256 | 21,615 | 2,435 | 0.256 | 21,615 |
| | | | | 3,500 | 2,435 | 0.256 | 21,615 | 2,435 | 0.256 | 21,615 |
| | | | | 6,500 | 2,435 | 0.256 | 21,615 | 2,435 | 0.256 | 21,615 |
| | | | 1 1/8" HS | 1,000 | 3,310 | 0.350 | 39,500 | 3,310 | 0.350 | 39,500 |
| | | | | 3,500 | 3,140 | 0.331 | 33,700 | 3,140 | 0.332 | 33,700 |
| | | | | 6,500 | 2,905 | 0.307 | 28,745 | 2,905 | 0.307 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,450 | 0.258 | 20,405 | 2,560 | 0.269 | 21,620 |
| | | | | 3,500 | 2,450 | 0.258 | 20,405 | 2,560 | 0.269 | 21,620 |
| | | | | 6,500 | 2,450 | 0.258 | 20,405 | 2,560 | 0.269 | 21,620 |
| | | | 1 1/8" HS | 1,000 | 3,760 | 0.397 | 40,260 | 3,915 | 0.414 | 44,955 |
| | | | | 3,500 | 3,760 | 0.397 | 40,260 | 3,805 | 0.402 | 41,385 |
| | | | | 6,500 | 3,595 | 0.379 | 36,500 | 3,595 | 0.380 | 36,500 |
| 4,000 | 1 1/8" STD | 1,000 | 2,450 | 0.258 | 19,105 | 2,715 | 0.286 | 21,620 | | |
| | | 3,500 | 2,450 | 0.258 | 19,105 | 2,715 | 0.286 | 21,620 | | |
| | | 6,500 | 2,450 | 0.258 | 19,105 | 2,715 | 0.286 | 21,620 | | |
| | 1 1/8" HS | 1,000 | 3,760 | 0.397 | 32,880 | 4,210 | 0.445 | 38,865 | | |
| | | 3,500 | 3,760 | 0.397 | 32,880 | 4,210 | 0.445 | 38,865 | | |
| | | 6,500 | 3,760 | 0.397 | 32,880 | 4,210 | 0.445 | 38,865 | | |
| HFX-21x9 | 104 1/4 | 2,500 | 1 1/8" STD | 1,000 | 3,050 | 0.304 | 21,565 | 3,050 | 0.304 | 21,565 |
| | | | | 3,500 | 3,020 | 0.300 | 21,255 | 3,020 | 0.300 | 21,255 |
| | | | | 6,500 | 3,010 | 0.299 | 21,175 | 3,010 | 0.299 | 21,175 |
| | | | 1 1/8" HS | 1,000 | 4,495 | 0.451 | 40,495 | 4,660 | 0.468 | 44,825 |
| | | | | 3,500 | 4,495 | 0.451 | 40,495 | 4,520 | 0.454 | 41,070 |
| | | | | 6,500 | 4,260 | 0.428 | 36,045 | 4,260 | 0.428 | 36,045 |
| | | 3,000 | 1 1/8" STD | 1,000 | 3,155 | 0.314 | 21,400 | 3,155 | 0.314 | 21,400 |
| | | | | 3,500 | 3,115 | 0.310 | 21,070 | 3,115 | 0.310 | 21,070 |
| | | | | 6,500 | 3,105 | 0.309 | 20,965 | 3,105 | 0.309 | 20,965 |
| | | | 1 1/8" HS | 1,000 | 4,495 | 0.451 | 34,645 | 5,270 | 0.529 | 46,095 |
| | | | | 3,500 | 4,495 | 0.451 | 34,645 | 5,195 | 0.522 | 44,690 |
| | | | | 6,500 | 4,495 | 0.451 | 34,645 | 5,080 | 0.510 | 42,755 |
| 4,000 | 1 1/8" STD | 1,000 | 3,285 | 0.327 | 21,220 | 3,285 | 0.327 | 21,220 | | |
| | | 3,500 | 3,240 | 0.322 | 20,865 | 3,240 | 0.322 | 20,865 | | |
| | | 6,500 | 3,225 | 0.321 | 20,770 | 3,225 | 0.321 | 20,770 | | |
| | 1 1/8" HS | 1,000 | 4,495 | 0.451 | 30,985 | 5,460 | 0.548 | 40,220 | | |
| | | 3,500 | 4,495 | 0.451 | 30,985 | 5,460 | 0.548 | 40,220 | | |
| | | 6,500 | 4,495 | 0.451 | 30,985 | 5,460 | 0.548 | 40,220 | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|-------------------------|--------------------------------------|---------------------|-------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^5,6$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^5,6$ (lbs) |
| HFX-24x9 | 104 1/4 | 2,500 | 1 1/8" STD | 1,000 | 3,140 | 0.175 | 17,810 | 3,525 | 0.197 | 20,490 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 5,230 | 0.294 | 35,310 | 6,015 | 0.338 | 45,935 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 3,000 | 1 1/8" STD | 1,000 | 3,140 | 0.175 | 17,270 | 3,620 | 0.202 | 20,380 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 1 1/8" HS | 1,000 | 5,230 | 0.294 | 32,375 | 6,350 | 0.357 | 43,195 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 3,140 | 0.175 | 16,680 | 3,685 | 0.206 | 19,925 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 1 1/8" HS | 1,000 | 5,230 | 0.294 | 29,900 | 6,350 | 0.357 | 38,105 | | | |
| | 3,500 | | | | | | | | | |
| | 6,500 | | | | | | | | | |
| HFX-32x9 | 104 1/4 | 2,500 | 7/8" STD | 1,000 | 2,190 | 0.181 | 9,320 | 2,500 | 0.207 | 10,630 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 7/8" HS | 1,000 | 2,655 | 0.220 | 11,295 | 2,655 | 0.220 | 11,295 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 3,000 | 7/8" STD | 1,000 | 2,190 | 0.181 | 9,320 | 2,665 | 0.221 | 11,350 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 7/8" HS | 1,000 | 3,230 | 0.268 | 13,755 | 3,230 | 0.268 | 13,755 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 4,000 | 7/8" STD | 1,000 | 2,190 | 0.181 | 9,320 | 2,665 | 0.221 | 11,350 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 7/8" HS | 1,000 | 3,885 | 0.322 | 16,530 | 4,310 | 0.357 | 18,330 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 3,000 | 7/8" STD | 1,000 | 2,190 | 0.181 | 9,320 | 2,550 | 0.211 | 10,845 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 7/8" HS | 1,000 | 3,720 | 0.308 | 15,830 | 3,720 | 0.308 | 15,830 | | | |
| | 3,500 | | | | | | | | | |
| | 6,500 | | | | | | | | | |
| 4,000 | 7/8" STD | 1,000 | 2,190 | 0.181 | 9,320 | 2,665 | 0.221 | 11,350 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 7/8" HS | 1,000 | 3,885 | 0.322 | 16,530 | 4,310 | 0.357 | 18,330 | | | |
| | 3,500 | | | | | | | | | |
| | 6,500 | | | | | | | | | |
| 3,000 | 7/8" STD | 1,000 | 2,745 | 0.121 | 8,005 | 3,405 | 0.151 | 9,930 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 7/8" HS | 1,000 | 3,995 | 0.177 | 11,645 | 3,995 | 0.177 | 11,645 | | | |
| | 3,500 | | | | | | | | | |
| | 6,500 | | | | | | | | | |
| 4,000 | 7/8" STD | 1,000 | 2,745 | 0.121 | 8,005 | 3,405 | 0.151 | 9,930 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| 7/8" HS | 1,000 | 4,640 | 0.206 | 13,530 | 4,640 | 0.205 | 13,530 | | | |
| | 3,500 | | | | | | | | | |
| | 6,500 | | | | | | | | | |
| HFX-44x9 | 104 1/4 | 2,500 | 7/8" STD | 1,000 | 2,745 | 0.121 | 8,005 | 3,405 | 0.151 | 9,930 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 7/8" HS | 1,000 | 3,995 | 0.177 | 11,645 | 3,995 | 0.177 | 11,645 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 3,000 | 7/8" STD | 1,000 | 2,745 | 0.121 | 8,005 | 3,405 | 0.151 | 9,930 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 7/8" HS | 1,000 | 4,860 | 0.215 | 14,175 | 4,860 | 0.215 | 14,175 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 4,000 | 7/8" STD | 1,000 | 2,745 | 0.121 | 8,005 | 3,405 | 0.151 | 9,930 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 7/8" HS | 1,000 | 5,260 | 0.233 | 15,340 | 5,260 | 0.233 | 15,340 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-12x10 | 116 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,175 | 0.273 | 19,595 | 1,175 | 0.273 | 19,595 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 1,080 | 0.252 | 17,005 | 965 | 0.225 | 14,325 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 3,000 | 1 1/8" STD | 1,000 | 1,185 | 0.276 | 17,740 | 1,340 | 0.313 | 21,575 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 1 1/8" HS | 1,000 | 1,350 | 0.316 | 21,810 | 1,415 | 0.331 | 23,750 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 4,000 | 1 1/8" STD | 1,000 | 1,185 | 0.276 | 16,095 | 1,215 | 0.284 | 18,375 | |
| | | | 3,500 | | | | | | | |
| | | | 6,500 | | | | | | | |
| | 1 1/8" HS | 1,000 | 1,350 | 0.316 | 19,015 | 1,900 | 0.444 | 32,065 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-15x10 | 116 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,625 | 0.414 | 21,620 | 1,625 | 0.412 | 21,620 |
| | | | | 3,500 | 1,615 | 0.411 | 21,380 | 1,615 | 0.409 | 21,380 |
| | | | | 6,500 | 1,580 | 0.402 | 20,560 | 1,580 | 0.400 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 1,915 | 0.488 | 31,340 | 1,915 | 0.488 | 31,340 |
| | | | | 3,500 | 1,795 | 0.457 | 26,150 | 1,795 | 0.457 | 26,150 |
| | | | | 6,500 | 1,625 | 0.414 | 21,625 | 1,625 | 0.414 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,740 | 0.442 | 21,615 | 1,740 | 0.440 | 21,615 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 2,000 | 0.509 | 27,060 | 2,310 | 0.587 | 38,195 |
| | | | | 3,500 | | | | 2,190 | 0.557 | 32,600 |
| | | | | 6,500 | | | | 2,030 | 0.516 | 27,795 |
| 4,000 | 1 1/8" STD | 1,000 | 1,880 | 0.478 | 21,620 | 1,880 | 0.476 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 2,000 | 0.509 | 23,435 | 2,540 | 0.646 | 33,185 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-18x10 | 116 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,185 | 0.282 | 21,620 | 2,185 | 0.282 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 2,970 | 0.386 | 39,500 | 2,970 | 0.386 | 39,500 |
| | | | | 3,500 | 2,815 | 0.366 | 33,700 | 2,815 | 0.366 | 33,700 |
| | | | | 6,500 | 2,605 | 0.339 | 28,745 | 2,605 | 0.339 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,255 | 0.291 | 21,110 | 2,295 | 0.296 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,370 | 0.438 | 40,205 | 3,510 | 0.456 | 44,955 |
| | | | | 3,500 | 3,220 | 0.419 | 36,500 | 3,410 | 0.443 | 41,385 |
| | | | | 6,500 | 3,220 | 0.419 | 36,500 | 3,220 | 0.419 | 36,500 |
| 4,000 | 1 1/8" STD | 1,000 | 2,255 | 0.291 | 19,700 | 2,435 | 0.314 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 3,370 | 0.438 | 32,855 | 4,070 | 0.529 | 44,000 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-21x10 | 116 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,740 | 0.348 | 21,615 | 2,740 | 0.348 | 21,615 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,970 | 0.509 | 39,075 | 4,180 | 0.536 | 44,825 |
| | | | | 3,500 | 3,820 | 0.489 | 36,045 | 4,055 | 0.519 | 41,070 |
| | | | | 6,500 | 3,820 | 0.489 | 36,045 | 3,820 | 0.489 | 36,045 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,855 | 0.362 | 21,620 | 2,855 | 0.362 | 21,620 |
| | | | | 3,500 | 2,845 | 0.361 | 21,545 | 2,845 | 0.361 | 21,545 |
| | | | | 6,500 | 2,835 | 0.360 | 21,430 | 2,835 | 0.360 | 21,430 |
| | | | 1 1/8" HS | 1,000 | 3,970 | 0.509 | 33,835 | 4,725 | 0.606 | 46,095 |
| | | | | 3,500 | 3,970 | 0.509 | 33,835 | 4,660 | 0.597 | 44,690 |
| | | | | 6,500 | | | | 4,555 | 0.584 | 42,755 |
| 4,000 | 1 1/8" STD | 1,000 | 2,975 | 0.378 | 21,465 | 2,975 | 0.378 | 21,465 | | |
| | | 3,500 | 2,965 | 0.376 | 21,365 | 2,965 | 0.376 | 21,365 | | |
| | | 6,500 | 2,950 | 0.375 | 21,260 | 2,950 | 0.375 | 21,260 | | |
| | 1 1/8" HS | 1,000 | 3,970 | 0.509 | 30,390 | 4,895 | 0.627 | 40,220 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-24x10 | 116 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,900 | 0.199 | 18,450 | 3,245 | 0.222 | 21,160 |
| | | | | 3,500 | | | | 3,215 | 0.220 | 20,910 |
| | | | | 6,500 | | | | 3,200 | 0.219 | 20,820 |
| | | | 1 1/8" HS | 1,000 | 4,690 | 0.325 | 35,285 | 5,395 | 0.373 | 45,935 |
| | | | | 3,500 | | | | 5,300 | 0.367 | 44,165 |
| | | | | 6,500 | | | | 5,165 | 0.357 | 41,850 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,900 | 0.199 | 17,865 | 3,335 | 0.229 | 21,040 |
| | | | | 3,500 | | | | 3,295 | 0.226 | 20,755 |
| | | | | 6,500 | | | | 3,285 | 0.225 | 20,660 |
| | | | 1 1/8" HS | 1,000 | 4,690 | 0.325 | 32,355 | 5,695 | 0.394 | 43,200 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,900 | 0.199 | 17,230 | 3,445 | 0.236 | 20,895 | | |
| | | 3,500 | | | | 3,400 | 0.233 | 20,580 | | |
| | | 6,500 | | | | 3,390 | 0.232 | 20,490 | | |
| | 1 1/8" HS | 1,000 | 4,690 | 0.325 | 29,885 | 5,695 | 0.394 | 38,110 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-32x10 | 116 1/4 | 2,500 | 7/8" STD | 1,000 | 2,030 | 0.230 | 9,630 | 2,240 | 0.254 | 10,630 |
| | | | | 3,500 | 1,715 | 0.194 | 8,130 | 1,715 | 0.194 | 8,130 |
| | | | | 6,500 | 1,080 | 0.122 | 5,130 | 1,080 | 0.122 | 5,130 |
| | | | 7/8" HS | 1,000 | 2,380 | 0.270 | 11,295 | 2,380 | 0.269 | 11,295 |
| | | | | 3,500 | 1,855 | 0.210 | 8,795 | 1,855 | 0.210 | 8,795 |
| | | | | 6,500 | 1,220 | 0.138 | 5,795 | 1,220 | 0.138 | 5,795 |
| | | 3,000 | 7/8" STD | 1,000 | 2,030 | 0.230 | 9,630 | 2,470 | 0.280 | 11,725 |
| | | | | 3,500 | 1,970 | 0.223 | 9,335 | 1,970 | 0.223 | 9,335 |
| | | | | 6,500 | 1,335 | 0.151 | 6,335 | 1,335 | 0.151 | 6,335 |
| | | | 7/8" HS | 1,000 | 2,900 | 0.329 | 13,755 | 2,900 | 0.328 | 13,755 |
| | | | | 3,500 | 2,370 | 0.269 | 11,255 | 2,370 | 0.268 | 11,255 |
| | | | | 6,500 | 1,740 | 0.197 | 8,255 | 1,740 | 0.197 | 8,255 |
| 4,000 | 7/8" STD | 1,000 | 2,030 | 0.230 | 9,630 | 2,470 | 0.280 | 11,725 | | |
| | | 3,500 | 2,030 | 0.230 | 9,630 | 2,285 | 0.259 | 10,845 | | |
| | | 6,500 | 1,655 | 0.187 | 7,845 | 1,655 | 0.187 | 7,845 | | |
| | 7/8" HS | 1,000 | 3,485 | 0.395 | 16,535 | 3,865 | 0.437 | 18,330 | | |
| | | 3,500 | 3,335 | 0.378 | 15,830 | 3,335 | 0.378 | 15,830 | | |
| | | 6,500 | 2,705 | 0.306 | 12,830 | 2,705 | 0.306 | 12,830 | | |
| HFX-44x10 | 116 1/4 | 2,500 | 7/8" STD | 1,000 | 2,570 | 0.154 | 8,355 | 3,185 | 0.191 | 10,355 |
| | | | | 3,500 | 2,570 | 0.154 | 8,355 | 2,575 | 0.154 | 8,365 |
| | | | | 6,500 | 1,650 | 0.099 | 5,365 | 1,650 | 0.099 | 5,365 |
| | | | 7/8" HS | 1,000 | 3,580 | 0.214 | 11,645 | 3,580 | 0.214 | 11,645 |
| | | | | 3,500 | 2,810 | 0.168 | 9,145 | 2,810 | 0.168 | 9,145 |
| | | | | 6,500 | 1,890 | 0.113 | 6,145 | 1,890 | 0.113 | 6,145 |
| | | 3,000 | 7/8" STD | 1,000 | 2,570 | 0.154 | 8,355 | 3,185 | 0.191 | 10,355 |
| | | | | 3,500 | 2,570 | 0.154 | 8,355 | 2,885 | 0.173 | 9,385 |
| | | | | 6,500 | 1,965 | 0.118 | 6,385 | 1,965 | 0.117 | 6,385 |
| | | | 7/8" HS | 1,000 | 4,360 | 0.261 | 14,175 | 4,360 | 0.261 | 14,175 |
| | | | | 3,500 | 3,590 | 0.215 | 11,675 | 3,590 | 0.215 | 11,675 |
| | | | | 6,500 | 2,665 | 0.160 | 8,675 | 2,665 | 0.160 | 8,675 |
| 4,000 | 7/8" STD | 1,000 | 2,570 | 0.154 | 8,355 | 3,185 | 0.191 | 10,355 | | |
| | | 3,500 | 2,570 | 0.154 | 8,355 | 2,355 | 0.141 | 7,655 | | |
| | | 6,500 | 2,355 | 0.141 | 7,655 | 2,355 | 0.141 | 7,655 | | |
| | 7/8" HS | 1,000 | 4,915 | 0.294 | 15,980 | 5,855 | 0.350 | 19,030 | | |
| | | 3,500 | 4,160 | 0.249 | 13,530 | 5,085 | 0.304 | 16,530 | | |
| | | 6,500 | 4,160 | 0.249 | 13,530 | 4,160 | 0.249 | 13,530 | | |
| HFX-15x11 | 128 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,475 | 0.466 | 21,615 | 1,475 | 0.465 | 21,615 |
| | | | | 3,500 | 1,465 | 0.463 | 21,380 | 1,465 | 0.462 | 21,380 |
| | | | | 6,500 | 1,430 | 0.452 | 20,560 | 1,430 | 0.451 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 1,735 | 0.549 | 31,340 | 1,735 | 0.549 | 31,340 |
| | | | | 3,500 | 1,625 | 0.515 | 26,150 | 1,625 | 0.515 | 26,150 |
| | | | | 6,500 | 1,475 | 0.466 | 21,625 | 1,475 | 0.466 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,575 | 0.498 | 21,620 | 1,575 | 0.497 | 21,620 |
| | | | | 3,500 | 1,575 | 0.498 | 21,620 | 2,090 | 0.662 | 38,195 |
| | | | | 6,500 | 1,575 | 0.498 | 21,620 | 1,985 | 0.628 | 32,600 |
| | | | 1 1/8" HS | 1,000 | 1,775 | 0.561 | 26,090 | 1,840 | 0.581 | 27,795 |
| | | | | 3,500 | 1,775 | 0.561 | 26,090 | 1,775 | 0.561 | 26,090 |
| | | | | 6,500 | 1,775 | 0.561 | 26,090 | 1,775 | 0.561 | 26,090 |
| 4,000 | 1 1/8" STD | 1,000 | 1,705 | 0.539 | 21,615 | 1,705 | 0.538 | 21,615 | | |
| | | 3,500 | 1,705 | 0.539 | 21,615 | 1,705 | 0.538 | 21,615 | | |
| | | 6,500 | 1,705 | 0.539 | 21,615 | 1,705 | 0.538 | 21,615 | | |
| | 1 1/8" HS | 1,000 | 1,775 | 0.561 | 22,800 | 2,255 | 0.713 | 32,090 | | |
| | | 3,500 | 1,775 | 0.561 | 22,800 | 1,775 | 0.561 | 22,800 | | |
| | | 6,500 | 1,775 | 0.561 | 22,800 | 1,775 | 0.561 | 22,800 | | |
| HFX-18x11 | 128 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,980 | 0.308 | 21,615 | 1,980 | 0.311 | 21,615 |
| | | | | 3,500 | 1,980 | 0.308 | 21,615 | 1,980 | 0.311 | 21,615 |
| | | | | 6,500 | 1,980 | 0.308 | 21,615 | 1,980 | 0.311 | 21,615 |
| | | | 1 1/8" HS | 1,000 | 2,690 | 0.420 | 39,500 | 2,690 | 0.420 | 39,500 |
| | | | | 3,500 | 2,550 | 0.399 | 33,700 | 2,550 | 0.399 | 33,700 |
| | | | | 6,500 | 2,365 | 0.369 | 28,745 | 2,365 | 0.369 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,080 | 0.324 | 21,600 | 2,080 | 0.327 | 21,620 |
| | | | | 3,500 | 2,080 | 0.324 | 21,600 | 2,080 | 0.327 | 21,620 |
| | | | | 6,500 | 2,080 | 0.324 | 21,600 | 2,080 | 0.327 | 21,620 |
| | | | 1 1/8" HS | 1,000 | 2,830 | 0.442 | 34,360 | 2,830 | 0.442 | 34,360 |
| | | | | 3,500 | 2,830 | 0.442 | 34,360 | 2,830 | 0.442 | 34,360 |
| | | | | 6,500 | 2,830 | 0.442 | 34,360 | 2,830 | 0.442 | 34,360 |
| 4,000 | 1 1/8" STD | 1,000 | 2,080 | 0.324 | 20,115 | 2,210 | 0.347 | 21,620 | | |
| | | 3,500 | 2,080 | 0.324 | 20,115 | 2,210 | 0.347 | 21,620 | | |
| | | 6,500 | 2,080 | 0.324 | 20,115 | 2,210 | 0.347 | 21,620 | | |
| | 1 1/8" HS | 1,000 | 2,830 | 0.442 | 29,585 | 2,830 | 0.442 | 29,585 | | |
| | | 3,500 | 2,830 | 0.442 | 29,585 | 2,830 | 0.442 | 29,585 | | |
| | | 6,500 | 2,830 | 0.442 | 29,585 | 2,830 | 0.442 | 29,585 | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-21x11 | 128 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,485 | 0.393 | 21,620 | 2,485 | 0.393 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,515 | 0.561 | 37,160 | 3,790 | 0.605 | 44,825 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,585 | 0.409 | 21,615 | 2,585 | 0.409 | 21,615 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,515 | 0.561 | 32,660 | 4,285 | 0.684 | 46,095 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,715 | 0.429 | 21,620 | 2,715 | 0.429 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 3,515 | 0.561 | 29,505 | 4,440 | 0.708 | 40,220 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-24x11 | 128 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,695 | 0.223 | 19,010 | 2,975 | 0.245 | 21,465 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,730 | 0.308 | 28,985 | 4,890 | 0.405 | 45,935 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,695 | 0.223 | 18,385 | 3,090 | 0.255 | 21,605 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,730 | 0.308 | 27,245 | 5,160 | 0.427 | 43,175 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,695 | 0.223 | 17,710 | 3,200 | 0.264 | 21,445 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 3,730 | 0.308 | 25,600 | 5,160 | 0.427 | 38,090 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-32x11 | 128 1/4 | 2,500 | 7/8" STD | 1,000 | 1,895 | 0.285 | 9,920 | 2,030 | 0.306 | 10,630 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 2,160 | 0.325 | 11,295 | 2,160 | 0.325 | 11,295 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 3,000 | 7/8" STD | 1,000 | 1,895 | 0.285 | 9,920 | 2,260 | 0.341 | 11,835 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 2,625 | 0.395 | 13,755 | 2,625 | 0.395 | 13,755 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 4,000 | 7/8" STD | 1,000 | 1,895 | 0.285 | 9,920 | 2,300 | 0.347 | 12,050 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 2,910 | 0.438 | 15,235 | 3,025 | 0.455 | 15,830 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| HFX-44x11 | 128 1/4 | 2,500 | 7/8" STD | 1,000 | 2,415 | 0.191 | 8,665 | 2,990 | 0.236 | 10,730 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 3,245 | 0.255 | 11,645 | 3,245 | 0.256 | 11,645 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 3,000 | 7/8" STD | 1,000 | 2,415 | 0.191 | 8,665 | 2,990 | 0.236 | 10,730 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 3,950 | 0.311 | 14,175 | 3,950 | 0.311 | 14,175 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | 4,000 | 7/8" STD | 1,000 | 2,415 | 0.191 | 8,665 | 2,990 | 0.236 | 10,730 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 7/8" HS | 1,000 | 4,155 | 0.327 | 14,905 | 4,875 | 0.384 | 17,490 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-15x12 | 140 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,345 | 0.521 | 21,615 | 1,345 | 0.520 | 21,615 |
| | | | | 3,500 | 1,340 | 0.517 | 21,380 | 1,340 | 0.516 | 21,380 |
| | | | | 6,500 | 1,310 | 0.505 | 20,560 | 1,310 | 0.504 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 1,590 | 0.614 | 31,310 | 1,590 | 0.614 | 31,340 |
| | | | | 3,500 | 1,490 | 0.575 | 26,150 | 1,490 | 0.575 | 26,150 |
| | | | | 6,500 | 1,350 | 0.521 | 21,625 | 1,350 | 0.521 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,440 | 0.557 | 21,615 | 1,440 | 0.556 | 21,615 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 1,590 | 0.614 | 25,160 | 1,915 | 0.739 | 38,195 |
| | | | | 3,500 | | | | 1,815 | 0.701 | 32,600 |
| | | | | 6,500 | | | | 1,680 | 0.650 | 27,795 |
| 4,000 | 1 1/8" STD | 1,000 | 1,555 | 0.602 | 21,620 | 1,555 | 0.601 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 1,590 | 0.614 | 22,165 | 2,015 | 0.779 | 31,020 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-18x12 | 140 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,810 | 0.334 | 21,620 | 1,810 | 0.334 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 2,460 | 0.456 | 39,500 | 2,460 | 0.456 | 39,500 |
| | | | | 3,500 | 2,335 | 0.432 | 33,700 | 2,335 | 0.432 | 33,700 |
| | | | | 6,500 | 2,160 | 0.400 | 28,745 | 2,160 | 0.400 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,905 | 0.351 | 21,615 | 1,905 | 0.351 | 21,615 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 2,585 | 0.479 | 34,295 | 2,585 | 0.479 | 34,295 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 1,935 | 0.357 | 20,530 | 2,020 | 0.373 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 2,585 | 0.479 | 29,545 | 2,585 | 0.479 | 29,545 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-21x12 | 140 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,270 | 0.470 | 21,620 | 2,270 | 0.470 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,030 | 0.633 | 33,190 | 3,465 | 0.724 | 44,825 |
| | | | | 3,500 | | | | 3,360 | 0.702 | 41,070 |
| | | | | 6,500 | | | | 3,165 | 0.661 | 36,045 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,365 | 0.490 | 21,620 | 2,365 | 0.490 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,030 | 0.633 | 29,955 | 3,730 | 0.779 | 41,750 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,480 | 0.514 | 21,620 | 2,480 | 0.514 | 21,620 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| | 1 1/8" HS | 1,000 | 3,030 | 0.633 | 27,410 | 3,730 | 0.779 | 35,785 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |
| HFX-24x12 | 140 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,515 | 0.246 | 19,490 | 2,735 | 0.268 | 21,620 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,410 | 0.334 | 28,975 | 4,470 | 0.439 | 45,935 |
| | | | | 3,500 | | | | 4,395 | 0.431 | 44,165 |
| | | | | 6,500 | | | | 4,280 | 0.420 | 41,850 |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,515 | 0.246 | 18,825 | 2,830 | 0.277 | 21,620 |
| | | | | 3,500 | | | | 2,825 | 0.277 | 21,605 |
| | | | | 6,500 | | | | 2,815 | 0.276 | 21,490 |
| | | | 1 1/8" HS | 1,000 | 3,410 | 0.334 | 27,235 | 4,720 | 0.463 | 43,195 |
| | | | | 3,500 | | | | | | |
| | | | | 6,500 | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,515 | 0.246 | 18,115 | 2,935 | 0.288 | 21,550 | | |
| | | 3,500 | | | | 2,925 | 0.287 | 21,460 | | |
| | | 6,500 | | | | 2,915 | 0.286 | 21,365 | | |
| | 1 1/8" HS | 1,000 | 3,410 | 0.334 | 25,595 | 4,720 | 0.463 | 38,105 | | |
| | | 3,500 | | | | | | | | |
| | | 6,500 | | | | | | | | |

Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) |
| HFX-32x12 | 140 1/4 | 2,500 | 7/8" STD | 1,000 | 1,775 | 0.347 | 10,160 | 1,855 | 0.364 | 10,630 |
| | | | | 3,500 | 1,420 | 0.278 | 8,130 | 1,420 | 0.278 | 8,130 |
| | | | | 6,500 | 895 | 0.175 | 5,130 | 895 | 0.175 | 5,130 |
| | | | 7/8" HS | 1,000 | 1,975 | 0.386 | 11,295 | 1,975 | 0.386 | 11,295 |
| | | | | 3,500 | 1,535 | 0.300 | 8,795 | 1,535 | 0.300 | 8,795 |
| | | | | 6,500 | 1,010 | 0.198 | 5,795 | 1,010 | 0.198 | 5,795 |
| | | 3,000 | 7/8" STD | 1,000 | 1,775 | 0.347 | 10,160 | 2,070 | 0.405 | 11,835 |
| | | | | 3,500 | 1,630 | 0.319 | 9,335 | 1,630 | 0.319 | 9,335 |
| | | | | 6,500 | 1,105 | 0.216 | 6,335 | 1,105 | 0.217 | 6,335 |
| | | | 7/8" HS | 1,000 | 2,405 | 0.470 | 13,755 | 2,405 | 0.470 | 13,755 |
| | | | | 3,500 | 1,965 | 0.384 | 11,255 | 1,965 | 0.385 | 11,255 |
| | | | | 6,500 | 1,440 | 0.282 | 8,255 | 1,440 | 0.282 | 8,255 |
| | | 4,000 | 7/8" STD | 1,000 | 1,775 | 0.347 | 10,160 | 2,155 | 0.422 | 12,335 |
| | | | | 3,500 | 1,775 | 0.347 | 10,160 | 1,895 | 0.371 | 10,845 |
| | | | | 6,500 | 1,370 | 0.268 | 7,845 | 1,370 | 0.268 | 7,845 |
| | | | 7/8" HS | 1,000 | 2,660 | 0.520 | 15,225 | 2,945 | 0.576 | 16,860 |
| | | | | 3,500 | 2,660 | 0.520 | 15,225 | 2,765 | 0.541 | 15,830 |
| | | | | 6,500 | 2,240 | 0.438 | 12,830 | 2,240 | 0.438 | 12,830 |
| HFX-44x12 | 140 1/4 | 2,500 | 7/8" STD | 1,000 | 2,280 | 0.231 | 8,945 | 2,770 | 0.281 | 10,865 |
| | | | | 3,500 | 2,135 | 0.216 | 8,365 | 2,135 | 0.216 | 8,365 |
| | | | | 6,500 | 1,370 | 0.139 | 5,365 | 1,370 | 0.139 | 5,365 |
| | | | 7/8" HS | 1,000 | 2,970 | 0.301 | 11,645 | 2,970 | 0.302 | 11,645 |
| | | | | 3,500 | 2,330 | 0.237 | 9,145 | 2,330 | 0.237 | 9,145 |
| | | | | 6,500 | 1,565 | 0.159 | 6,145 | 1,565 | 0.159 | 6,145 |
| | | 3,000 | 7/8" STD | 1,000 | 2,280 | 0.231 | 8,945 | 2,820 | 0.286 | 11,060 |
| | | | | 3,500 | 2,280 | 0.231 | 8,945 | 2,390 | 0.242 | 9,385 |
| | | | | 6,500 | 1,625 | 0.165 | 6,385 | 1,625 | 0.165 | 6,385 |
| | | | 7/8" HS | 1,000 | 3,615 | 0.367 | 14,175 | 3,615 | 0.367 | 14,175 |
| | | | | 3,500 | 2,975 | 0.302 | 11,675 | 2,975 | 0.302 | 11,675 |
| | | | | 6,500 | 2,210 | 0.225 | 8,675 | 2,210 | 0.225 | 8,675 |
| | | 4,000 | 7/8" STD | 1,000 | 2,280 | 0.231 | 8,945 | 2,820 | 0.286 | 11,060 |
| | | | | 3,500 | 2,280 | 0.231 | 8,945 | 2,715 | 0.275 | 10,655 |
| | | | | 6,500 | 1,950 | 0.198 | 7,655 | 1,950 | 0.198 | 7,655 |
| | | | 7/8" HS | 1,000 | 3,800 | 0.386 | 14,910 | 3,955 | 0.402 | 15,515 |
| | | | | 3,500 | 3,800 | 0.386 | 14,910 | 3,450 | 0.351 | 13,530 |
| | | | | 6,500 | 3,450 | 0.350 | 13,530 | 3,450 | 0.351 | 13,530 |
| HFX-15x13 | 152 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,240 | 0.576 | 21,615 | 1,240 | 0.575 | 21,615 |
| | | | | 3,500 | 1,235 | 0.573 | 21,380 | 1,235 | 0.572 | 21,380 |
| | | | | 6,500 | 1,205 | 0.559 | 20,560 | 1,205 | 0.558 | 20,560 |
| | | | 1 1/8" HS | 1,000 | 1,435 | 0.666 | 29,315 | 1,465 | 0.680 | 31,340 |
| | | | | 3,500 | 1,370 | 0.637 | 26,150 | 1,370 | 0.637 | 26,150 |
| | | | | 6,500 | 1,240 | 0.577 | 21,625 | 1,240 | 0.577 | 21,625 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,325 | 0.616 | 21,620 | 1,325 | 0.615 | 21,620 |
| | | | | 3,500 | 1,325 | 0.616 | 21,620 | 1,325 | 0.615 | 21,620 |
| | | | | 6,500 | 1,325 | 0.616 | 21,620 | 1,325 | 0.615 | 21,620 |
| | | | 1 1/8" HS | 1,000 | 1,435 | 0.666 | 24,360 | 1,765 | 0.819 | 38,195 |
| | | | | 3,500 | 1,435 | 0.666 | 24,360 | 1,670 | 0.777 | 32,600 |
| | | | | 6,500 | 1,435 | 0.666 | 24,360 | 1,550 | 0.719 | 27,795 |
| | | 4,000 | 1 1/8" STD | 1,000 | 1,435 | 0.666 | 21,605 | 1,435 | 0.665 | 21,620 |
| | | | | 3,500 | 1,435 | 0.666 | 21,605 | 1,435 | 0.665 | 21,620 |
| | | | | 6,500 | 1,435 | 0.666 | 21,605 | 1,435 | 0.665 | 21,620 |
| | | | 1 1/8" HS | 1,000 | 1,820 | 0.846 | 30,090 | 1,820 | 0.846 | 30,090 |
| | | | | 3,500 | 1,820 | 0.846 | 30,090 | 1,820 | 0.846 | 30,090 |
| | | | | 6,500 | 1,820 | 0.846 | 30,090 | 1,820 | 0.846 | 30,090 |
| HFX-18x13 | 152 1/4 | 2,500 | 1 1/8" STD | 1,000 | 1,665 | 0.358 | 21,615 | 1,665 | 0.359 | 21,615 |
| | | | | 3,500 | 1,665 | 0.358 | 21,615 | 1,665 | 0.359 | 21,615 |
| | | | | 6,500 | 1,665 | 0.358 | 21,615 | 1,665 | 0.359 | 21,615 |
| | | | 1 1/8" HS | 1,000 | 2,250 | 0.487 | 38,395 | 2,265 | 0.490 | 39,500 |
| | | | | 3,500 | 2,150 | 0.465 | 33,700 | 2,150 | 0.465 | 33,700 |
| | | | | 6,500 | 1,990 | 0.431 | 28,745 | 1,990 | 0.431 | 28,745 |
| | | 3,000 | 1 1/8" STD | 1,000 | 1,755 | 0.377 | 21,615 | 1,755 | 0.377 | 21,615 |
| | | | | 3,500 | 1,755 | 0.377 | 21,615 | 1,755 | 0.377 | 21,615 |
| | | | | 6,500 | 1,755 | 0.377 | 21,615 | 1,755 | 0.377 | 21,615 |
| | | | 1 1/8" HS | 1,000 | 2,250 | 0.487 | 31,080 | 2,380 | 0.515 | 34,260 |
| | | | | 3,500 | 2,250 | 0.487 | 31,080 | 2,380 | 0.515 | 34,260 |
| | | | | 6,500 | 2,250 | 0.487 | 31,080 | 2,380 | 0.515 | 34,260 |
| | | 4,000 | 1 1/8" STD | 1,000 | 1,805 | 0.388 | 20,840 | 1,860 | 0.400 | 21,615 |
| | | | | 3,500 | 1,805 | 0.388 | 20,840 | 1,860 | 0.400 | 21,615 |
| | | | | 6,500 | 1,805 | 0.388 | 20,840 | 1,860 | 0.400 | 21,615 |
| | | | 1 1/8" HS | 1,000 | 2,250 | 0.487 | 27,415 | 2,380 | 0.515 | 29,520 |
| | | | | 3,500 | 2,250 | 0.487 | 27,415 | 2,380 | 0.515 | 29,520 |
| | | | | 6,500 | 2,250 | 0.487 | 27,415 | 2,380 | 0.515 | 29,520 |

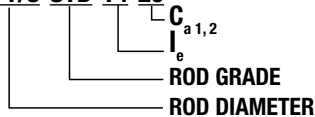
Table 1.1A Hardy Frame® Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|--------|--------|--------|--------|--------|--------|----------|---------|-------|--------|-------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | | | | | | | | | | | | | | | | | | | | | |
| HFX-21x13 | 152 1/4 | 2,500 | 1 1/8" STD | 1,000 | 2,095 | 0.518 | 21,620 | 2,095 | 0.518 | 21,620 | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | | | | | | | 2,850 | 0.666 | 34,445 | 3,190 | 0.747 | 44,825 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | 2,180 | 0.539 | 21,620 | 2,180 | 0.539 | 21,620 | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 1/8" HS | 1,000 | 2,850 | | | | | | | 0.666 | 30,845 | 3,610 | 0.844 | 46,095 | | | | | | | | | | | | | | | | |
| | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4,000 | 1 1/8" STD | 1,000 | 2,285 | | 0.566 | 21,620 | 2,285 | 0.566 | 21,620 | | | | | | | | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 1/8" HS | 1,000 | | 2,850 | | | | | | 0.666 | 28,110 | 3,615 | 0.846 | 38,380 | | | | | | | | | | | | | | | | | |
| | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HFX-24x13 | 152 1/4 | 2,500 | 1 1/8" STD | | 1,000 | 2,360 | 0.271 | 19,935 | 2,520 | | | | | | 0.289 | 21,615 | | | | | | | | | | | | | | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,140 | | | | | 0.360 | 28,960 | 4,120 | 0.473 | 45,935 | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3,000 | 1 1/8" STD | 1,000 | | 2,360 | 0.271 | 19,235 | 2,605 | | | | | | 0.299 | 21,620 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,140 | | | | | 0.360 | 27,220 | 4,350 | 0.499 | 43,230 | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 4,000 | 1 1/8" STD | 1,000 | | 2,360 | 0.271 | 18,490 | 2,715 | | | | | | 0.311 | 21,620 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 1/8" HS | 1,000 | 3,140 | | | | | 0.360 | 25,580 | 4,350 | 0.499 | 38,130 | | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HFX-32x13 | 152 1/4 | 2,500 | 7/8" STD | 1,000 | | 1,670 | 0.415 | 10,380 | 1,710 | | | | | | 0.425 | 10,630 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7/8" HS | 1,000 | | | | | 1,820 | 0.452 | 11,295 | 1,820 | 0.452 | | | 11,295 | | | | | | | | | | | | | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3,000 | 7/8" STD | 1,000 | | | | | | | | | | | | | 1,670 | 0.415 | 10,380 | 1,905 | 0.473 | 11,835 | | | | | | | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7/8" HS | 1,000 | | | | | | | | | | | | | | | | | | | 2,215 | 0.550 | 13,755 | 2,215 | 0.550 | 13,755 | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 4,000 | 7/8" STD | 1,000 | 1,670 | 0.415 | 10,380 | 2,025 | 0.503 | | | | | | 12,585 | | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 7/8" HS | 1,000 | | | | | | 2,305 | 0.573 | 14,325 | 2,305 | 0.573 | | 14,325 | | | | | | | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | HFX-44x13 | 152 1/4 | 2,500 | | | | | | | | | | | | | 7/8" STD | 1,000 | 2,160 | 0.277 | 9,200 | 2,550 | 0.327 | | | | | | | 10,865 | |
| | | | | | | | | | | | | | | | | | | 3,500 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 6,500 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 7/8" HS | | | | | | 1,000 | 2,735 | 0.351 | 11,645 | 2,735 | 0.351 | | 11,645 |
| | | | | | | | | | | | | | | | | | | | | | | | | 3,500 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 6,500 | | | | | | | |
| 3,000 | 7/8" STD | | | | 1,000 | 2,160 | 0.277 | 9,200 | 2,665 | | | | | | 0.342 | | 11,355 | | | | | | | | | | | | | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7/8" HS | | | | 1,000 | | | | | 3,110 | 0.399 | 13,245 | 3,110 | 0.399 | | 13,245 | | | | | | | | | | | | | | | |
| | | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4,000 | 7/8" STD | | | 1,000 | 2,160 | | | | | | | | | | | | | 0.277 | 9,200 | 2,665 | 0.342 | 11,355 | | | | | | | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7/8" HS | | | 1,000 | | | | | | | | | | | | | | | | | | | 3,110 | 0.399 | 13,245 | 3,110 | 0.399 | 13,245 | | | |
| | | | | 3,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6,500 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 1.1A Hardy Frame® Balloon Wall Installation - on Concrete^{1,2}

| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | | | | | | | | | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|---------------------------|--------------------------------------|---------------------|---------------------------|-------|-----------|--------|-------|-------|--------|-------|-------|--------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^{5,6}$ (lbs) | | | | | | | | | |
| HFX-15x14 | 164 1/4 | 2,500 | 1 1/8" HS | 4,000 | 1,120 | 0.611 | 20,680 | 1,250 | 0.767 | 25,325 | | | | | | | | | |
| | | 3,000 | | | | | 18,925 | | | 29,870 | | | | | | | | | |
| | | 4,000 | | | | | 17,460 | | | 25,135 | | | | | | | | | |
| HFX-18x14 | | 164 1/4 | | | 2,500 | 1 1/8" HS | 4,000 | 1,380 | 0.642 | 18,475 | 1,960 | 0.912 | 32,455 | | | | | | |
| | | | | | 3,000 | | | | | 17,545 | | | 28,170 | | | | | | |
| | | | | | 4,000 | | | | | 16,630 | | | 25,320 | | | | | | |
| HFX-21x14 | | | | | 164 1/4 | | | 2,500 | 1 1/8" HS | 4,000 | 2,115 | 0.512 | 24,300 | 2,850 | 0.862 | 40,385 | | | |
| | | | | | | | | 3,000 | | | | | 22,895 | | | 37,905 | | | |
| | | | | | | | | 4,000 | | | | | 21,555 | | | 33,290 | | | |
| HFX-24x14 | | | | | | | | 164 1/4 | | | 2,500 | 1 1/8" HS | 4,000 | 2,090 | 0.527 | 18,855 | 3,190 | 0.805 | 33,155 |
| | | | | | | | | | | | 3,000 | | | | | 18,240 | | | 30,680 |
| | | | | | | | | | | | 4,000 | | | | | 17,580 | | | 28,505 |
| HFX-15x15 | 176 1/4 | | 2,500 | 1 1/8" HS | | | | | | | 3,500 | | | 1,045 | 0.655 | 20,745 | 1,185 | 0.833 | 26,150 |
| | | | 3,000 | | | | | | | | | | | | | 18,975 | | | 29,995 |
| | | | 4,000 | | | | | | | | | | | | | 17,500 | | | 25,205 |
| HFX-18x15 | | 176 1/4 | 2,500 | | | 1 1/8" HS | 3,500 | | | | | | | 1,310 | 0.701 | 18,935 | 1,830 | 0.979 | 32,595 |
| | | | 3,000 | | | | | | | | | | | | | 17,955 | | | 28,250 |
| | | | 4,000 | | | | | | | | | | | | | 16,990 | | | 25,380 |
| HFX-21x15 | | | 176 1/4 | | 2,500 | | | | 1 1/8" HS | 3,500 | | | | 1,975 | 0.591 | 24,370 | 2,620 | 0.979 | 39,120 |
| | | | | | 3,000 | | | | | | | | | | | 22,955 | | | 33,860 |
| | | | | | 4,000 | | | | | | | | | | | 21,605 | | | 30,405 |
| HFX-24x15 | | | | | 176 1/4 | | | 2,500 | | | | 1 1/8" HS | 3,500 | 1,960 | 0.597 | 19,000 | 2,830 | 0.859 | 30,790 |
| | | | | | | | | 3,000 | | | | | | | | 18,375 | | | 28,750 |
| | | | | | | | | 4,000 | | | | | | | | 17,700 | | | 26,890 |
| HFX-15x16 | 188 1/4 | | | 2,500 | | | | 1 1/8" HS | | | 3,000 | | | 980 | 0.700 | 20,805 | 1,125 | 0.901 | 27,015 |
| | | | | 3,000 | | | | | | | | | | | | 19,025 | | | 30,105 |
| | | | | 4,000 | | | | | | | | | | | | 17,540 | | | 25,265 |
| HFX-18x16 | | 188 1/4 | | 2,500 | | 1 1/8" HS | 3,000 | | | | | | | 1,250 | 0.760 | 19,435 | 1,715 | 1.046 | 32,655 |
| | | | | 3,000 | | | | | | | | | | | | 18,385 | | | 28,285 |
| | | | | 4,000 | | | | | | | | | | | | 17,365 | | | 25,410 |
| HFX-21x16 | | | 188 1/4 | 2,500 | | | | | 1 1/8" HS | 3,000 | | | | 1,850 | 0.675 | 24,430 | 2,295 | 1.046 | 34,255 |
| | | | | 3,000 | | | | | | | | | | | | 23,005 | | | 30,715 |
| | | | | 4,000 | | | | | | | | | | | | 21,650 | | | 28,005 |
| HFX-24x16 | | | | 188 1/4 | 2,500 | | | | | | | 1 1/8" HS | 3,000 | 1,825 | 0.625 | 18,875 | 2,670 | 0.913 | 31,140 |
| | | | | | 3,000 | | | | | | | | | | | 18,255 | | | 29,040 |
| | | | | | 4,000 | | | | | | | | | | | 17,595 | | | 27,130 |
| HFX-15x17 | 200 1/4 | | | | 2,500 | | | 1 1/8" HS | | | 2,500 | | | 925 | 0.745 | 20,860 | 1,070 | 0.970 | 27,940 |
| | | | | | 3,000 | | | | | | | | | | | 19,065 | | | 30,200 |
| | | | | | 4,000 | | | | | | | | | | | 17,570 | | | 25,320 |
| HFX-18x17 | | 200 1/4 | | | 2,500 | 1 1/8" HS | 2,500 | | | | | | | 1,195 | 0.824 | 19,890 | 1,230 | 1.113 | 32,780 |
| | | | | | 3,000 | | | | | | | | | | | 18,775 | | | 28,360 |
| | | | | | 4,000 | | | | | | | | | | | 17,705 | | | 25,465 |
| HFX-21x17 | | | 200 1/4 | | 2,500 | | | | 1 1/8" HS | 2,500 | | | | 1,745 | 0.765 | 24,485 | 2,260 | 1.112 | 37,390 |
| | | | | | 3,000 | | | | | | | | | | | 23,050 | | | 32,810 |
| | | | | | 4,000 | | | | | | | | | | | 21,690 | | | 29,620 |
| HFX-24x17 | | | | 200 1/4 | 2,500 | | | | | | | 1 1/8" HS | 2,500 | 1,695 | 0.660 | 18,600 | 2,485 | 0.967 | 30,685 |
| | | | | | 3,000 | | | | | | | | | | | 18,005 | | | 28,665 |
| | | | | | 4,000 | | | | | | | | | | | 17,360 | | | 26,815 |
| HFX-15x18 | 212 1/4 | | | | 2,500 | | | 1 1/8" HS | | | 2,000 | | | 875 | 0.789 | 20,905 | 1,025 | 1.041 | 28,940 |
| | | | | | 3,000 | | | | | | | | | | | 19,100 | | | 30,285 |
| | | | | | 4,000 | | | | | | | | | | | 17,600 | | | 25,365 |
| HFX-18x18 | | 212 1/4 | | | 2,500 | 1 1/8" HS | 2,000 | | | | | | | 1,150 | 0.887 | 20,445 | 1,530 | 1.179 | 33,090 |
| | | | | | 3,000 | | | | | | | | | | | 19,250 | | | 28,545 |
| | | | | | 4,000 | | | | | | | | | | | 18,120 | | | 25,600 |
| HFX-21x18 | | | 212 1/4 | | 2,500 | | | | 1 1/8" HS | 2,000 | | | | 1,645 | 0.860 | 24,530 | 2,010 | 1.179 | 33,445 |
| | | | | | 3,000 | | | | | | | | | | | 23,090 | | | 30,135 |
| | | | | | 4,000 | | | | | | | | | | | 21,725 | | | 27,555 |
| HFX-24x18 | | | | 212 1/4 | 2,500 | | | | | | | 1 1/8" HS | 2,000 | 1,595 | 0.697 | 18,540 | 2,335 | 1.020 | 30,505 |
| | | | | | 3,000 | | | | | | | | | | | 17,950 | | | 28,515 |
| | | | | | 4,000 | | | | | | | | | | | 17,310 | | | 26,685 |

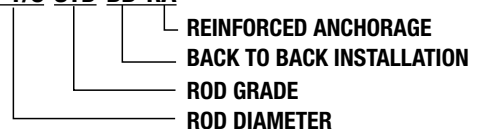
UNREINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-14-20



REINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-RA



BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-BB-RA

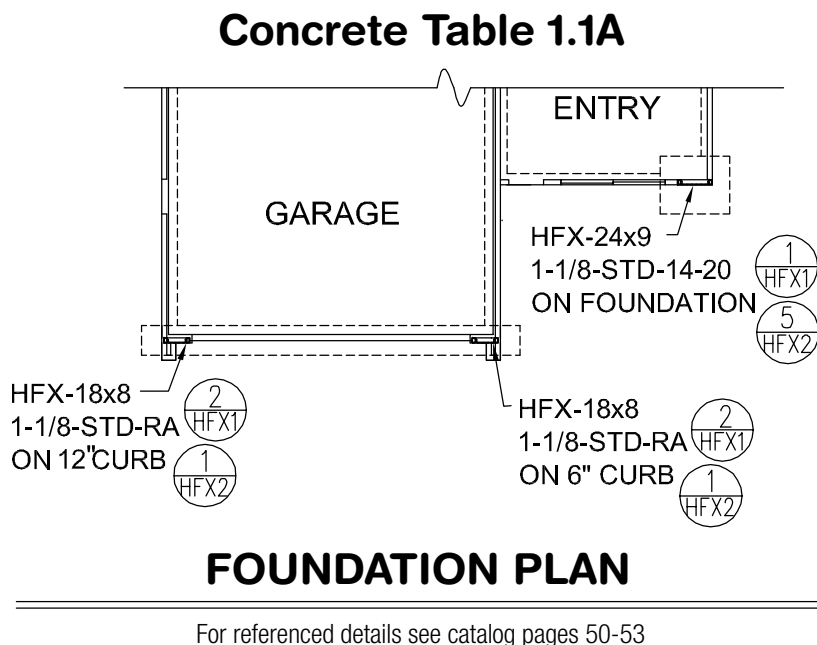
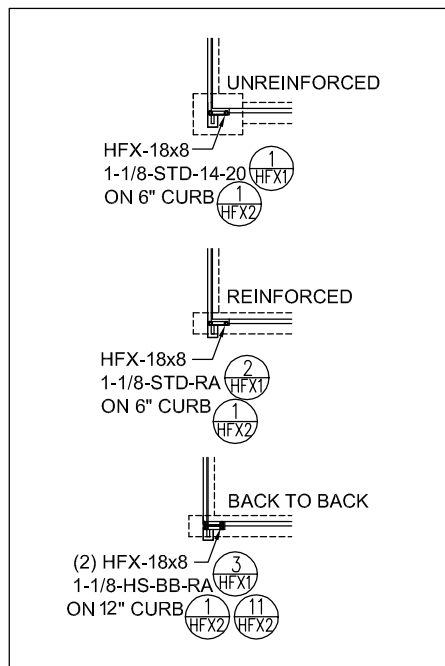


| Model Number | Net Height H (in) | Concrete Compressive Strength f'_c (psi) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | | | | | | | |
|--------------|-------------------|--|---|---------------------------------|--------------------------------------|---------------------|-------------------------|--------------------------------------|---------------------|-------------------------|-------|-------|--------|-------|-------|--------|
| | | | | | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^5,6$ (lbs) | Allowable In-Plane Shear V^5 (lbs) | Drift at V^5 (in) | Uplift at $V^5,6$ (lbs) | | | | | | |
| HFX-15x19 | 224 1/4 | 2,500 | 1 1/8" HS | 2,000 | 825 | 0.834 | 20,950 | 970 | 1.098 | 28,940 | | | | | | |
| | | 3,000 | | | | | 19,130 | | | 30,360 | | | | | | |
| | | 4,000 | | | | | 17,625 | | | 25,410 | | | | | | |
| HFX-18x19 | | 224 1/4 | | | 2,500 | 1 1/8" HS | 2,000 | 1,105 | 0.953 | 20,885 | 1,450 | 1.246 | 33,190 | | | |
| | | | | | 3,000 | | | | | 19,625 | | | 28,600 | | | |
| | | | | | 4,000 | | | | | 18,440 | | | 25,640 | | | |
| HFX-21x19 | | | | | 224 1/4 | | | 2,500 | 1 1/8" HS | 2,000 | 1,560 | 0.961 | 24,575 | 1,800 | 1.246 | 30,460 |
| | | | | | | | | 3,000 | | | | | 23,130 | | | 27,910 |
| | | | | | | | | 4,000 | | | | | 21,755 | | | 25,770 |
| HFX-24x19 | 224 1/4 | | 2,500 | 1 1/8" HS | | | | 2,000 | | | 1,515 | 0.734 | 18,620 | 2,220 | 1.072 | 30,700 |
| | | | 3,000 | | | | | | | | | | 18,020 | | | 28,680 |
| | | | 4,000 | | | | | | | | | | 17,380 | | | 26,825 |
| HFX-15x20 | | 236 1/4 | 2,500 | | | 1 1/8" HS | 2,000 | | | | 785 | 0.879 | 20,985 | 920 | 1.156 | 28,940 |
| | | | 3,000 | | | | | | | | | | 19,160 | | | 30,430 |
| | | | 4,000 | | | | | | | | | | 17,650 | | | 25,445 |
| HFX-18x20 | | | 236 1/4 | | 2,500 | | | | 1 1/8" HS | 2,000 | 1,070 | 1.020 | 21,490 | 1,220 | 1.166 | 26,315 |
| | | | | | 3,000 | | | | | | | | 20,135 | | | 23,990 |
| | | | | | 4,000 | | | | | | | | 18,875 | | | 22,075 |
| HFX-21x20 | 236 1/4 | | | 2,500 | 1 1/8" HS | | | 2,000 | | | 1,485 | 1.068 | 24,610 | 1,620 | 1.313 | 28,060 |
| | | | | 3,000 | | | | | | | | | 23,160 | | | 26,020 |
| | | | | 4,000 | | | | | | | | | 21,785 | | | 24,210 |
| HFX-24x20 | | 236 1/4 | | 2,500 | | 1 1/8" HS | 2,000 | | | | 1,460 | 0.770 | 18,965 | 2,130 | 1.124 | 31,190 |
| | | | | 3,000 | | | | | | | | | 18,340 | | | 29,085 |
| | | | | 4,000 | | | | | | | | | 17,670 | | | 27,170 |

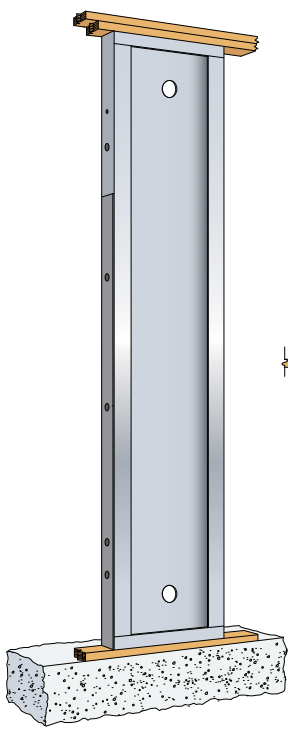
For Sl: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb = 4.45 N, 1 psi = 6.89 kPa.

Notes

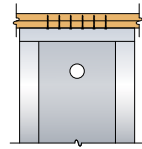
- 1) The values in this table are Allowable Stress Design (ASD) excluding a 1.33 stress increase and pertain to installation on 2500, 3000, and 4000 psi concrete or nut & washer with 5,000 psi minimum non-shrink grout.
- 2) For installation on a nut & washer (only) table values must be multiplied by 0.80.
- 3) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.
- 4) The applied vertical axial loads are concurrent with the allowable shear load. For Panels the axial load must be applied within the middle 1/3 of the Panel width or be uniformly distributed across the entire Panel width. For Brace Frame the axial load is acting and along the centerline of the post.
- 5) Allowable Shear, Drift @ V and Uplift @ V values may be linearly interpolated for intermediate height or axial loads.
- 6) The Uplift values listed assume no resisting axial load. To determine anchor tension loads in Panels at design shear values and including the effect of axial loads, refer to the equation on page 40 of this catalog. For Brace Frames the anchor tension load equals uplift minus P, where P is the axial load in the Post.



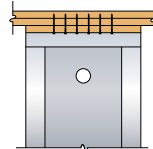
For referenced details see catalog pages 50-53



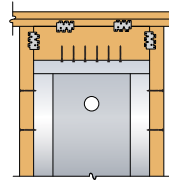
PANEL



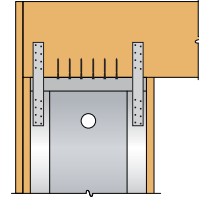
Top Plates
1/4 x 3" Screws



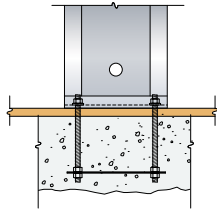
2x Filler
1/4 x 4 1/2" Screws



4x Filler
1/4 x 3" Screws
*Custom Heights Available



Portal
1/4 x 3" Screws. 78 Inch
Panel Heights Include
Welded Straps

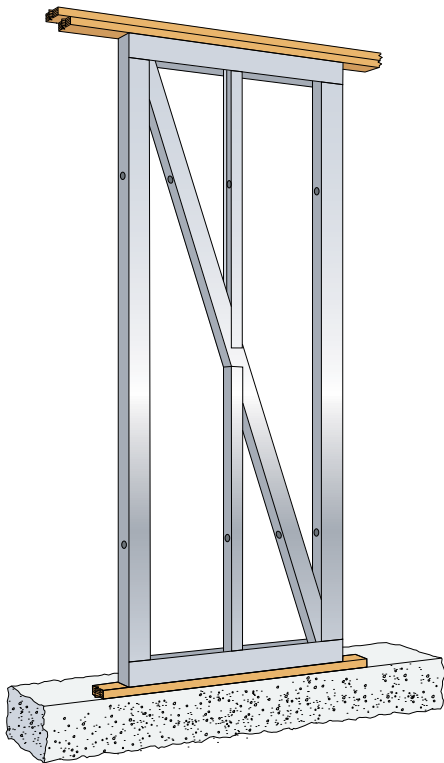


Wood Sill

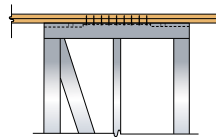
- Panels installed on wood sill plates have more ductility but, for some sizes the allowable shear is less to account for crushing of wood below.
- Allowable values in Table 1.2 have been reduced when necessary to maintain code drift limit.
- Because the Brace Frame base is wider, overturning forces cause less compression on wood sill.

Installation:

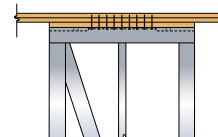
- Set bolts 4 1/4" inches above concrete
- Moisture barrier (15# felt, Moist Stop, Etc.) recommended when installing on treated wood.



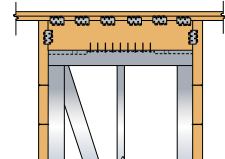
BRACE FRAME



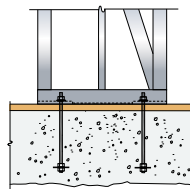
Top Plates
1/4 x 3" Screws



2x Filler
1/4 x 4 1/2" Screws



4x Filler
1/4 x 3" Screws
*Custom Heights Available



Wood Sill

Table 1.2 Hardy Frame® Installation - on 2x Sill Plate^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-12x78 | 78 | 1 1/8" STD | 1,000 | 1,065 | 0.341 | 11,500 | 1,130 | 0.373 | 12,220 |
| | | | 3,500 | 770 | 0.278 | 7,220 | 770 | 0.278 | 7,220 |
| | | | 6,500 | 340 | 0.167 | 1,220 | 340 | 0.167 | 1,220 |
| HFX-15x78 | 78 | 1 1/8" STD | 1,000 | 1,445 | 0.341 | 11,875 | 1,485 | 0.353 | 12,220 |
| | | | 3,500 | 1,035 | 0.269 | 7,220 | 1,035 | 0.268 | 7,220 |
| | | | 6,500 | 495 | 0.166 | 1,220 | 495 | 0.166 | 1,220 |
| HFX-18x78 | 78 | 1 1/8" STD | 1,000 | 1,975 | 0.287 | 12,220 | 1,975 | 0.286 | 12,220 |
| | | | 3,500 | 1,380 | 0.219 | 7,220 | 1,380 | 0.219 | 7,220 |
| | | | 6,500 | 670 | 0.137 | 1,220 | 670 | 0.137 | 1,220 |
| HFX-21x78 | 78 | 1 1/8" STD | 1,000 | 2,460 | 0.267 | 12,220 | 2,460 | 0.267 | 12,220 |
| | | | 3,500 | 1,725 | 0.203 | 7,220 | 1,725 | 0.203 | 7,220 |
| | | | 6,500 | 840 | 0.126 | 1,220 | 840 | 0.126 | 1,220 |
| HFX-24x78 | 78 | 1 1/8" STD | 1,000 | 2,950 | 0.220 | 12,220 | 2,950 | 0.220 | 12,220 |
| | | | 3,500 | 2,070 | 0.168 | 7,220 | 2,070 | 0.168 | 7,220 |
| | | | 6,500 | 1,010 | 0.106 | 1,220 | 1,010 | 0.106 | 1,220 |
| HFX-12x8 | 92 1/4 | 1 1/8" STD | 1,000 | 905 | 0.404 | 11,565 | 955 | 0.438 | 12,220 |
| | | | 3,500 | 650 | 0.327 | 7,220 | 650 | 0.327 | 7,220 |
| | | | 6,500 | 285 | 0.196 | 1,220 | 285 | 0.196 | 1,220 |
| HFX-15x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,205 | 0.404 | 11,725 | 1,255 | 0.426 | 12,220 |
| | | | 3,500 | 875 | 0.324 | 7,220 | 875 | 0.323 | 7,220 |
| | | | 6,500 | 420 | 0.199 | 1,220 | 420 | 0.199 | 1,220 |
| HFX-18x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,670 | 0.336 | 12,220 | 1,670 | 0.336 | 12,220 |
| | | | 3,500 | 1,165 | 0.257 | 7,220 | 1,165 | 0.257 | 7,220 |
| | | | 6,500 | 565 | 0.161 | 1,220 | 565 | 0.161 | 1,220 |
| HFX-21x8 | 92 1/4 | 1 1/8" STD | 1,000 | 2,080 | 0.322 | 12,220 | 2,080 | 0.322 | 12,220 |
| | | | 3,500 | 1,460 | 0.244 | 7,220 | 1,460 | 0.244 | 7,220 |
| | | | 6,500 | 710 | 0.151 | 1,220 | 710 | 0.151 | 1,220 |
| HFX-24x8 | 92 1/4 | 1 1/8" STD | 1,000 | 2,495 | 0.259 | 12,220 | 2,495 | 0.259 | 12,220 |
| | | | 3,500 | 1,750 | 0.198 | 7,220 | 1,750 | 0.198 | 7,220 |
| | | | 6,500 | 855 | 0.125 | 1,220 | 855 | 0.125 | 1,220 |
| HFX-32x8 | 92 1/4 | 7/8" STD | 1,000 | 2,135 | 0.183 | 8,040 | 2,135 | 0.183 | 8,040 |
| | | | 3,500 | 1,470 | 0.134 | 5,540 | 1,470 | 0.134 | 5,540 |
| | | | 6,500 | 675 | 0.075 | 2,540 | 675 | 0.075 | 2,540 |
| HFX-44x8 | 92 1/4 | 7/8" STD | 1,000 | 2,950 | 0.159 | 7,610 | 3,215 | 0.156 | 8,295 |
| | | | 3,500 | 2,245 | 0.112 | 5,795 | 2,245 | 0.112 | 5,795 |
| | | | 6,500 | 1,085 | 0.065 | 2,795 | 1,085 | 0.065 | 2,795 |
| | | 7/8" HS | 1,000 | 3,215 | 0.156 | 8,295 | 3,215 | 0.156 | 8,295 |
| | | | 3,500 | 2,245 | 0.112 | 5,795 | 2,245 | 0.112 | 5,795 |
| | | | 6,500 | 1,085 | 0.065 | 2,795 | 1,085 | 0.065 | 2,795 |
| HFX-12x9 | 104 1/4 | 1 1/8" STD | 1,000 | 805 | 0.456 | 11,610 | 845 | 0.492 | 12,220 |
| | | | 3,500 | 575 | 0.368 | 7,220 | 575 | 0.368 | 7,220 |
| | | | 6,500 | 255 | 0.221 | 1,220 | 255 | 0.221 | 1,220 |
| HFX-15x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,055 | 0.456 | 11,610 | 1,110 | 0.488 | 12,220 |
| | | | 3,500 | 775 | 0.370 | 7,220 | 775 | 0.369 | 7,220 |
| | | | 6,500 | 370 | 0.227 | 1,220 | 370 | 0.227 | 1,220 |
| HFX-18x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,475 | 0.379 | 12,220 | 1,475 | 0.379 | 12,220 |
| | | | 3,500 | 1,035 | 0.289 | 7,220 | 1,035 | 0.289 | 7,220 |
| | | | 6,500 | 500 | 0.182 | 1,220 | 500 | 0.182 | 1,220 |
| HFX-21x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,840 | 0.369 | 12,220 | 1,840 | 0.369 | 12,220 |
| | | | 3,500 | 1,290 | 0.280 | 7,220 | 1,290 | 0.280 | 7,220 |
| | | | 6,500 | 630 | 0.172 | 1,220 | 630 | 0.172 | 1,220 |
| HFX-24x9 | 104 1/4 | 1 1/8" STD | 1,000 | 2,210 | 0.291 | 12,220 | 2,210 | 0.291 | 12,220 |
| | | | 3,500 | 1,550 | 0.222 | 7,220 | 1,550 | 0.223 | 7,220 |
| | | | 6,500 | 755 | 0.140 | 1,220 | 755 | 0.141 | 1,220 |
| HFX-32x9 | 104 1/4 | 7/8" STD | 1,000 | 1,890 | 0.222 | 8,040 | 1,890 | 0.222 | 8,040 |
| | | | 3,500 | 1,300 | 0.162 | 5,540 | 1,300 | 0.162 | 5,540 |
| | | | 6,500 | 595 | 0.090 | 2,540 | 595 | 0.090 | 2,540 |
| HFX-44x9 | 104 1/4 | 7/8" STD | 1,000 | 2,745 | 0.188 | 8,005 | 2,845 | 0.186 | 8,295 |
| | | | 3,500 | 1,990 | 0.133 | 5,795 | 1,990 | 0.133 | 5,795 |
| | | | 6,500 | 960 | 0.077 | 2,795 | 960 | 0.077 | 2,795 |
| | | 7/8" HS | 1,000 | 2,845 | 0.186 | 8,295 | 2,845 | 0.186 | 8,295 |
| | | | 3,500 | 1,990 | 0.133 | 5,795 | 1,990 | 0.133 | 5,795 |
| | | | 6,500 | 960 | 0.077 | 2,795 | 960 | 0.077 | 2,795 |
| HFX-12x10 | 116 1/4 | 1 1/8" STD | 1,000 | 725 | 0.508 | 11,640 | 760 | 0.546 | 12,220 |
| | | | 3,500 | 515 | 0.408 | 7,220 | 515 | 0.408 | 7,220 |
| | | | 6,500 | 225 | 0.246 | 1,220 | 225 | 0.246 | 1,220 |
| HFX-15x10 | 116 1/4 | 1 1/8" STD | 1,000 | 940 | 0.509 | 11,510 | 995 | 0.551 | 12,220 |
| | | | 3,500 | 695 | 0.417 | 7,220 | 695 | 0.416 | 7,220 |
| | | | 6,500 | 335 | 0.256 | 1,220 | 335 | 0.255 | 1,220 |
| HFX-18x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,325 | 0.420 | 12,220 | 1,325 | 0.420 | 12,220 |
| | | | 3,500 | 925 | 0.321 | 7,220 | 925 | 0.321 | 7,220 |
| | | | 6,500 | 450 | 0.202 | 1,220 | 450 | 0.202 | 1,220 |
| HFX-21x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,650 | 0.417 | 12,220 | 1,650 | 0.417 | 12,220 |
| | | | 3,500 | 1,155 | 0.315 | 7,220 | 1,155 | 0.315 | 7,220 |
| | | | 6,500 | 565 | 0.194 | 1,220 | 565 | 0.194 | 1,220 |

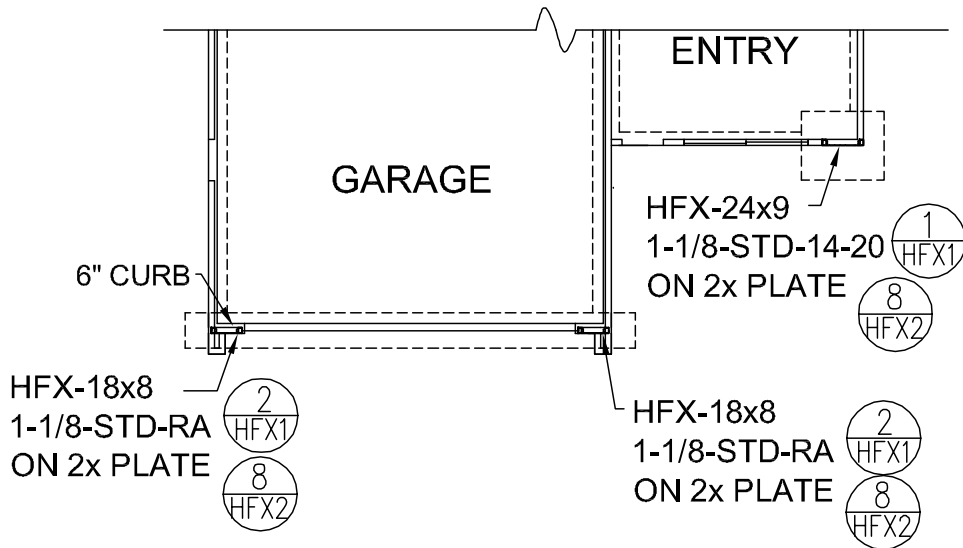
Table 1.2 Hardy Frame® Installation - on 2x Sill Plate^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-24x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,980 | 0.323 | 12,220 | 1,980 | 0.323 | 12,220 |
| | | | 3,500 | 1,390 | 0.247 | 7,220 | 1,390 | 0.247 | 7,220 |
| | | | 6,500 | 680 | 0.156 | 1,220 | 680 | 0.156 | 1,220 |
| HFX-32x10 | 116 1/4 | 7/8" STD | 1,000 | 1,695 | 0.265 | 8,040 | 1,695 | 0.265 | 8,040 |
| | | | 3,500 | 1,170 | 0.193 | 5,540 | 1,170 | 0.192 | 5,540 |
| | | | 6,500 | 535 | 0.106 | 2,540 | 535 | 0.106 | 2,540 |
| HFX-44x10 | 116 1/4 | 7/8" STD | 1,000 | 2,550 | 0.220 | 8,295 | 2,550 | 0.220 | 8,295 |
| | | | 3,500 | 1,785 | 0.157 | 5,795 | 1,785 | 0.157 | 5,795 |
| | | | 6,500 | 860 | 0.090 | 2,795 | 860 | 0.090 | 2,795 |
| HFX-15x11 | 128 1/4 | 1 1/8" STD | 1,000 | 845 | 0.561 | 11,430 | 905 | 0.614 | 12,220 |
| | | | 3,500 | 630 | 0.464 | 7,220 | 630 | 0.464 | 7,220 |
| | | | 6,500 | 300 | 0.284 | 1,220 | 300 | 0.284 | 1,220 |
| HFX-18x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,200 | 0.462 | 12,220 | 1,200 | 0.463 | 12,220 |
| | | | 3,500 | 840 | 0.353 | 7,220 | 840 | 0.354 | 7,220 |
| | | | 6,500 | 405 | 0.222 | 1,220 | 405 | 0.223 | 1,220 |
| HFX-21x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,500 | 0.465 | 12,220 | 1,500 | 0.465 | 12,220 |
| | | | 3,500 | 1,050 | 0.352 | 7,220 | 1,050 | 0.352 | 7,220 |
| | | | 6,500 | 510 | 0.216 | 1,220 | 510 | 0.216 | 1,220 |
| HFX-24x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,795 | 0.355 | 12,220 | 1,795 | 0.354 | 12,220 |
| | | | 3,500 | 1,260 | 0.272 | 7,220 | 1,260 | 0.271 | 7,220 |
| | | | 6,500 | 615 | 0.172 | 1,220 | 615 | 0.172 | 1,220 |
| HFX-32x11 | 128 1/4 | 7/8" STD | 1,000 | 1,535 | 0.311 | 8,040 | 1,535 | 0.311 | 8,040 |
| | | | 3,500 | 1,060 | 0.226 | 5,540 | 1,060 | 0.226 | 5,540 |
| | | | 6,500 | 485 | 0.123 | 2,540 | 485 | 0.123 | 2,540 |
| HFX-44x11 | 128 1/4 | 7/8" STD | 1,000 | 2,315 | 0.257 | 8,295 | 2,315 | 0.257 | 8,295 |
| | | | 3,500 | 1,615 | 0.184 | 5,795 | 1,615 | 0.183 | 5,795 |
| | | | 6,500 | 780 | 0.104 | 2,795 | 780 | 0.104 | 2,795 |
| HFX-15x12 | 140 1/4 | 1 1/8" STD | 1,000 | 770 | 0.613 | 11,345 | 825 | 0.678 | 12,220 |
| | | | 3,500 | 575 | 0.513 | 7,220 | 575 | 0.512 | 7,220 |
| | | | 6,500 | 275 | 0.313 | 1,220 | 275 | 0.313 | 1,220 |
| HFX-18x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,095 | 0.503 | 12,220 | 1,095 | 0.503 | 12,220 |
| | | | 3,500 | 770 | 0.385 | 7,220 | 770 | 0.385 | 7,220 |
| | | | 6,500 | 370 | 0.243 | 1,220 | 370 | 0.243 | 1,220 |
| HFX-21x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,370 | 0.532 | 12,220 | 1,370 | 0.532 | 12,220 |
| | | | 3,500 | 960 | 0.401 | 7,220 | 960 | 0.401 | 7,220 |
| | | | 6,500 | 465 | 0.244 | 1,220 | 465 | 0.244 | 1,220 |
| HFX-24x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,640 | 0.386 | 12,220 | 1,640 | 0.387 | 12,220 |
| | | | 3,500 | 1,150 | 0.296 | 7,220 | 1,150 | 0.296 | 7,220 |
| | | | 6,500 | 565 | 0.187 | 1,220 | 565 | 0.187 | 1,220 |
| HFX-32x12 | 140 1/4 | 7/8" STD | 1,000 | 1,405 | 0.362 | 8,040 | 1,405 | 0.362 | 8,040 |
| | | | 3,500 | 970 | 0.262 | 5,540 | 970 | 0.262 | 5,540 |
| | | | 6,500 | 445 | 0.141 | 2,540 | 445 | 0.141 | 2,540 |
| HFX-44x12 | 140 1/4 | 7/8" STD | 1,000 | 2,115 | 0.296 | 8,295 | 2,115 | 0.296 | 8,295 |
| | | | 3,500 | 1,480 | 0.211 | 5,795 | 1,480 | 0.211 | 5,795 |
| | | | 6,500 | 715 | 0.119 | 2,795 | 715 | 0.119 | 2,795 |
| HFX-15x13 | 152 1/4 | 1 1/8" STD | 1,000 | 705 | 0.666 | 11,265 | 760 | 0.743 | 12,220 |
| | | | 3,500 | 530 | 0.561 | 7,220 | 530 | 0.561 | 7,220 |
| | | | 6,500 | 255 | 0.342 | 1,220 | 255 | 0.342 | 1,220 |
| HFX-18x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,010 | 0.543 | 12,220 | 1,010 | 0.544 | 12,220 |
| | | | 3,500 | 705 | 0.416 | 7,220 | 705 | 0.416 | 7,220 |
| | | | 6,500 | 345 | 0.262 | 1,220 | 345 | 0.263 | 1,220 |
| HFX-21x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,260 | 0.582 | 12,220 | 1,260 | 0.582 | 12,220 |
| | | | 3,500 | 885 | 0.439 | 7,220 | 885 | 0.439 | 7,220 |
| | | | 6,500 | 430 | 0.266 | 1,220 | 430 | 0.266 | 1,220 |
| HFX-24x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,510 | 0.419 | 12,220 | 1,510 | 0.418 | 12,220 |
| | | | 3,500 | 1,060 | 0.321 | 7,220 | 1,060 | 0.320 | 7,220 |
| | | | 6,500 | 520 | 0.203 | 1,220 | 520 | 0.203 | 1,220 |
| HFX-32x13 | 152 1/4 | 7/8" STD | 1,000 | 1,295 | 0.417 | 8,040 | 1,295 | 0.417 | 8,040 |
| | | | 3,500 | 890 | 0.300 | 5,540 | 890 | 0.300 | 5,540 |
| | | | 6,500 | 410 | 0.161 | 2,540 | 410 | 0.161 | 2,540 |
| HFX-44x13 | 152 1/4 | 7/8" STD | 1,000 | 1,950 | 0.338 | 8,295 | 1,950 | 0.338 | 8,295 |
| | | | 3,500 | 1,360 | 0.241 | 5,795 | 1,360 | 0.241 | 5,795 |
| | | | 6,500 | 655 | 0.135 | 2,795 | 655 | 0.135 | 2,795 |

For Sl: 1 inch = 25.4 mm, 1 lbf = 4.45 N

- The values in this table are Allowable Stress Design (ASD) excluding a 1.33 stress increase and pertain to installation on a Wood Sill Plate supported on concrete or masonry foundations.
- Wood Sill Plate assumes 2x wood sill plate ($F_c \perp = 625$ psi) below the Panel or Brace Frame.
- STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.
- The additional vertical axial loads are concurrent with the allowable shear load. For Panels the axial load must be applied within the middle 1/3 of the Panel width or be uniformly distributed across the entire Panel width. For Brace Frames the axial load is acting along the centerline of the post.
- Allowable Shear, Drift @ V and Uplift @ V values may be linearly interpolated for intermediate height or axial loads.
- The Uplift values listed assume no resisting axial load. To determine the anchor tension load in Panels at design shear values and including the effect of axial loads, the tension load equals uplift minus P/2, where P is the axial load on the Panel. For Brace Frames the anchor tension load equals uplift minus P, where P is the axial load on the Post.

On 2x Plate Table 1.2



FOUNDATION PLAN

For referenced details see catalog pages 50-53

UNREINFORCED ANCHORAGE NOMENCLATURE

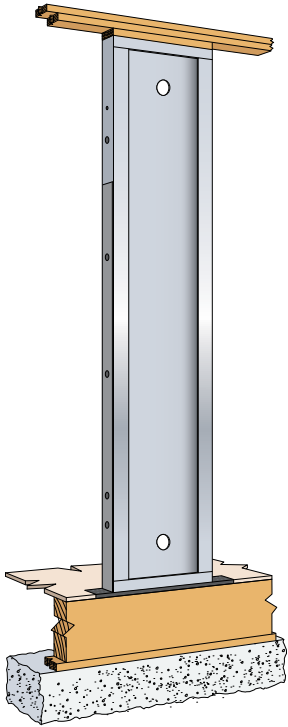
1 1/8-STD-14-20
 $C_{a1,2}$
 I_e
 ROD GRADE
 ROD DIAMETER

REINFORCED ANCHORAGE NOMENCLATURE

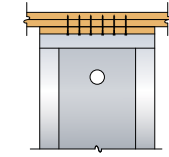
1 1/8-STD-RA
 REINFORCED ANCHORAGE
 ROD GRADE
 ROD DIAMETER

BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE

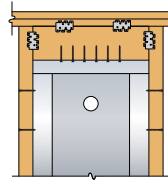
1 1/8-STD-BB-RA
 REINFORCED ANCHORAGE
 BACK TO BACK INSTALLATION
 ROD GRADE
 ROD DIAMETER



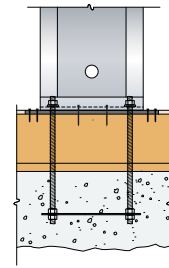
PANEL



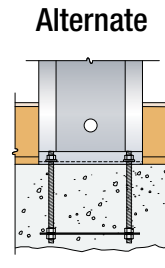
2x Filler
1/4 x 4 1/2" Screws



4x Filler
1/4 x 3" Screws
*Custom Heights Available



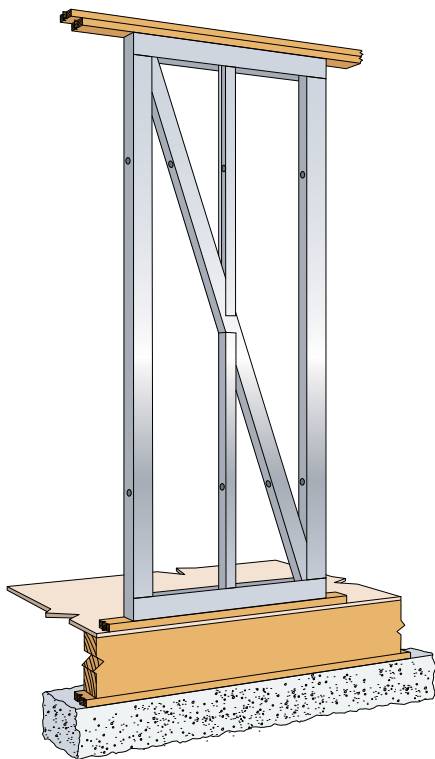
Raised Floor
1/4 x 4 1/2" Screws



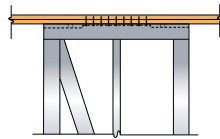
Alternate

**Raised Floor
Head Out**

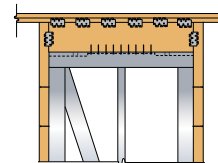
- Allowable values in Table 1.2A have been reduced when necessary to maintain code drift limit.
- Table values for Panels installed on a wood floor system assume installation of a Hardy Frame® Bearing Plate.
- Installing at raised floor head-out
 - Provides allowable values from Table 1.1A.
 - Provides a direct shear transfer to the foundation.
 - Requires less material by eliminating rim, Bearing Plate and bottom screw
- Because Brace Frames are wider, overturning forces cause less compression on wood below.
- Unlike Panels, Brace Frames install on the bottom plate above floor systems. Hardy Frame® Bearing Plates are not necessary.



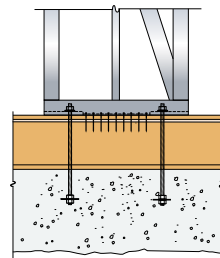
BRACE FRAME



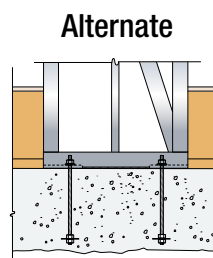
Top Plates
1/4 x 3" Screws



4x Filler
1/4 x 3" Screws
*Custom Heights Available



Raised Floor
1/4 x 4 1/2" Screws



Alternate

**Raised Floor
Head Out**

Table 1.2A Hardy Frame® Installation - on Raised Floors^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-12x78 | 78 | 1 1/8" STD | 1,000 | 1,380 | 0.341 | 12,165 | 1,755 | 0.433 | 15,585 |
| | | | 3,500 | 1,350 | | 10,625 | 1,685 | | 13,720 |
| | | | 6,500 | 1,310 | | 8,775 | 1,400 | | 9,610 |
| HFX-15x78 | 78 | 1 1/8" STD | 1,000 | 1,780 | 0.341 | 12,545 | 2,245 | 0.433 | 15,945 |
| | | | 3,500 | 1,750 | | 10,965 | 2,175 | | 14,065 |
| | | | 6,500 | 1,715 | | 9,070 | 1,790 | | 9,610 |
| HFX-18x78 | 78 | 1 1/8" STD | 1,000 | 2,875 | 0.341 | 15,935 | 3,430 | 0.433 | 19,100 |
| | | | 3,500 | 2,780 | | 14,055 | 3,050 | | 15,610 |
| | | | 6,500 | 2,285 | | 9,610 | 2,285 | | 9,610 |
| HFX-21x78 | 78 | 1 1/8" STD | 1,000 | 3,635 | 0.341 | 16,520 | 4,355 | 0.433 | 19,915 |
| | | | 3,500 | 3,525 | | 14,690 | 3,720 | | 15,610 |
| | | | 6,500 | 2,775 | | 9,610 | 2,775 | | 9,610 |
| HFX-24x78 | 78 | 1 1/8" STD | 1,000 | 3,830 | 0.236 | 14,700 | 5,105 | 0.343 | 19,770 |
| | | | 3,500 | | 0.243 | 13,395 | 4,385 | 0.292 | 15,610 |
| | | | 6,500 | | 0.210 | 9,610 | 3,270 | 0.210 | 9,610 |
| | | 1 1/8" HS | 1,000 | 5,070 | 0.341 | 19,620 | 5,315 | 0.363 | 20,610 |
| | | | 3,500 | 4,385 | 0.293 | 15,610 | 4,385 | 0.293 | 15,610 |
| | | | 6,500 | 3,270 | 0.211 | 9,610 | 3,270 | 0.211 | 9,610 |
| HFX-12x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,180 | 0.404 | 12,305 | 1,490 | 0.512 | 15,690 |
| | | | 3,500 | 1,155 | | 10,760 | 1,435 | | 13,820 |
| | | | 6,500 | 1,120 | | 8,910 | 1,185 | | 9,610 |
| HFX-15x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,475 | 0.404 | 12,260 | 1,870 | 0.512 | 15,690 |
| | | | 3,500 | 1,450 | | 10,685 | 1,810 | | 13,815 |
| | | | 6,500 | 1,420 | | 8,795 | 1,510 | | 9,610 |
| HFX-18x8 | 92 1/4 | 1 1/8" STD | 1,000 | 2,450 | 0.404 | 16,055 | 2,920 | 0.512 | 19,230 |
| | | | 3,500 | 2,370 | | 14,170 | 2,580 | | 15,610 |
| | | | 6,500 | 1,930 | | 9,610 | 1,930 | | 9,610 |
| HFX-21x8 | 92 1/4 | 1 1/8" STD | 1,000 | 3,025 | 0.404 | 16,245 | 3,625 | 0.512 | 19,585 |
| | | | 3,500 | 2,930 | | 14,425 | 3,145 | | 15,610 |
| | | | 6,500 | 2,350 | | 9,610 | 2,350 | | 9,610 |
| HFX-24x8 | 92 1/4 | 1 1/8" STD | 1,000 | 3,420 | 0.292 | 15,555 | 4,495 | 0.425 | 20,610 |
| | | | 3,500 | | 0.307 | 14,250 | 3,710 | 0.343 | 15,610 |
| | | | 6,500 | | 0.246 | 9,610 | 2,765 | 0.247 | 9,610 |
| | | 1 1/8" HS | 1,000 | 4,315 | 0.404 | 19,770 | 4,495 | 0.426 | 20,610 |
| | | | 3,500 | 3,710 | 0.344 | 15,610 | 3,710 | 0.344 | 15,610 |
| | | | 6,500 | 2,765 | 0.247 | 9,610 | 2,765 | 0.248 | 9,610 |
| HFX-32x8 | 92 1/4 | 7/8" STD | 1,000 | 2,135 | 0.310 | 8,040 | 2,135 | 0.310 | 8,040 |
| | | | 3,500 | 1,470 | 0.229 | 5,540 | 1,470 | 0.229 | 5,540 |
| | | | 6,500 | 675 | 0.139 | 2,540 | 675 | 0.139 | 2,540 |
| HFX-44x8 | 92 1/4 | 7/8" STD | 1,000 | 2,950 | 0.269 | 7,610 | 3,215 | 0.264 | 8,295 |
| | | | 3,500 | 2,245 | 0.188 | 5,795 | 2,245 | 0.188 | 5,795 |
| | | | 6,500 | 1,085 | 0.118 | 2,795 | 1,085 | 0.118 | 2,795 |
| | | 7/8" HS | 1,000 | 3,215 | 0.263 | 8,295 | 3,215 | 0.263 | 8,295 |
| | | | 3,500 | 2,245 | 0.188 | 5,795 | 2,245 | 0.188 | 5,795 |
| | | | 6,500 | 1,085 | 0.118 | 2,795 | 1,085 | 0.118 | 2,795 |
| HFX-12x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,050 | 0.456 | 12,395 | 1,325 | 0.579 | 15,770 |
| | | | 3,500 | 1,030 | | 10,850 | 1,275 | | 13,900 |
| | | | 6,500 | 1,000 | | 8,995 | 1,050 | | 9,610 |
| HFX-15x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,285 | 0.456 | 12,050 | 1,635 | 0.579 | 15,500 |
| | | | 3,500 | 1,260 | | 10,480 | 1,585 | | 13,635 |
| | | | 6,500 | 1,235 | | 8,595 | 1,340 | | 9,610 |
| HFX-18x9 | 104 1/4 | 1 1/8" STD | 1,000 | 2,175 | 0.456 | 16,100 | 2,590 | 0.579 | 19,285 |
| | | | 3,500 | 2,100 | | 14,215 | 2,285 | | 15,610 |
| | | | 6,500 | 1,710 | | 9,610 | 1,710 | | 9,610 |
| HFX-21x9 | 104 1/4 | 1 1/8" STD | 1,000 | 2,640 | 0.456 | 16,040 | 3,170 | 0.579 | 19,340 |
| | | | 3,500 | 2,565 | | 14,230 | 2,785 | | 15,610 |
| | | | 6,500 | 2,080 | | 9,610 | 2,080 | | 9,610 |
| HFX-24x9 | 104 1/4 | 1 1/8" STD | 1,000 | 3,140 | 0.346 | 16,160 | 3,980 | 0.477 | 20,610 |
| | | | 3,500 | | 0.362 | 14,850 | 3,285 | 0.385 | 15,610 |
| | | | 6,500 | | 0.277 | 9,610 | 2,450 | 0.277 | 9,610 |
| | | 1 1/8" HS | 1,000 | 3,835 | 0.456 | 19,855 | 3,980 | 0.478 | 20,610 |
| | | | 3,500 | 3,285 | 0.386 | 15,610 | 3,285 | 0.386 | 15,610 |
| | | | 6,500 | 2,450 | 0.278 | 9,610 | 2,450 | 0.278 | 9,610 |
| HFX-32x9 | 104 1/4 | 7/8" STD | 1,000 | 1,890 | 0.365 | 8,040 | 1,890 | 0.365 | 8,040 |
| | | | 3,500 | 1,300 | 0.269 | 5,540 | 1,300 | 0.269 | 5,540 |
| | | | 6,500 | 595 | 0.162 | 2,540 | 595 | 0.162 | 2,540 |
| HFX-44x9 | 104 1/4 | 7/8" STD | 1,000 | 2,745 | 0.312 | 8,005 | 2,845 | 0.308 | 8,295 |
| | | | 3,500 | 1,990 | 0.219 | 5,795 | 1,990 | 0.220 | 5,795 |
| | | | 6,500 | 960 | 0.136 | 2,795 | 960 | 0.136 | 2,795 |
| | | 7/8" HS | 1,000 | 2,845 | 0.308 | 8,295 | 2,845 | 0.308 | 8,295 |
| | | | 3,500 | 1,990 | 0.220 | 5,795 | 1,990 | 0.220 | 5,795 |
| | | | 6,500 | 960 | 0.136 | 2,795 | 960 | 0.136 | 2,795 |
| HFX-12x10 | 116 1/4 | 1 1/8" STD | 1,000 | 950 | 0.509 | 12,475 | 1,195 | 0.646 | 15,835 |
| | | | 3,500 | 925 | | 10,925 | 1,150 | | 13,965 |
| | | | 6,500 | 900 | | 9,070 | 940 | | 9,610 |

Table 1.2A Hardy Frame® Installation - on Raised Floors^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-15x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,135 | 0.509 | 11,865 | 1,445 | 0.646 | 15,280 |
| | | | 3,500 | 1,115 | | 10,295 | 1,405 | | 13,470 |
| | | | 6,500 | 1,090 | | 8,415 | 1,200 | | 9,610 |
| HFX-18x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,960 | 0.509 | 16,190 | 2,335 | 0.646 | 19,380 |
| | | | 3,500 | 1,895 | | 14,300 | 2,050 | | 15,610 |
| | | | 6,500 | 1,530 | | 9,610 | 1,530 | | 9,610 |
| HFX-21x10 | 116 1/4 | 1 1/8" STD | 1,000 | 2,345 | 0.509 | 15,860 | 2,810 | 0.646 | 19,125 |
| | | | 3,500 | 2,275 | | 14,050 | 2,495 | | 15,610 |
| | | | 6,500 | 1,865 | | 9,610 | 1,865 | | 9,610 |
| HFX-24x10 | 116 1/4 | 1 1/8" STD | 1,000 | 2,900 | 0.400 | 16,655 | 3,565 | 0.529 | 20,610 |
| | | | 3,500 | 2,900 | | 15,350 | 2,945 | | 15,610 |
| | | | 6,500 | 2,195 | | 9,610 | 2,195 | | 9,610 |
| | | 1 1/8" HS | 1,000 | 3,450 | 0.509 | 19,910 | 3,565 | 0.531 | 20,610 |
| | | | 3,500 | 2,945 | 0.429 | 15,610 | 2,945 | 0.429 | 15,610 |
| | | | 6,500 | 2,195 | 0.309 | 9,610 | 2,195 | 0.308 | 9,610 |
| HFX-32x10 | 116 1/4 | 7/8" STD | 1,000 | 1,695 | 0.425 | 8,040 | 1,695 | 0.425 | 8,040 |
| | | | 3,500 | 1,170 | 0.312 | 5,540 | 1,170 | 0.312 | 5,540 |
| | | | 6,500 | 535 | 0.186 | 2,540 | 535 | 0.186 | 2,540 |
| HFX-44x10 | 116 1/4 | 7/8" STD | 1,000 | 2,550 | 0.356 | 8,295 | 2,550 | 0.356 | 8,295 |
| | | | 3,500 | 1,785 | 0.254 | 5,795 | 1,785 | 0.254 | 5,795 |
| | | | 6,500 | 860 | 0.156 | 2,795 | 860 | 0.156 | 2,795 |
| HFX-15x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,015 | 0.561 | 11,720 | 1,295 | 0.712 | 15,065 |
| | | | 3,500 | 1,000 | | 10,155 | 1,260 | | 13,320 |
| | | | 6,500 | 975 | | 8,275 | 1,090 | | 9,610 |
| HFX-18x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,780 | 0.561 | 16,240 | 2,115 | 0.712 | 19,375 |
| | | | 3,500 | 1,720 | | 14,345 | 1,855 | | 15,610 |
| | | | 6,500 | 1,390 | | 9,610 | 1,390 | | 9,610 |
| HFX-21x11 | 128 1/4 | 1 1/8" STD | 1,000 | 2,105 | 0.561 | 15,695 | 2,520 | 0.712 | 18,925 |
| | | | 3,500 | 2,040 | | 13,890 | 2,260 | | 15,610 |
| | | | 6,500 | 1,690 | | 9,610 | 1,690 | | 9,610 |
| HFX-24x11 | 128 1/4 | 1 1/8" STD | 1,000 | 2,695 | 0.455 | 17,090 | 3,235 | 0.580 | 20,610 |
| | | | 3,500 | 2,670 | 0.469 | 15,610 | 2,670 | 0.468 | 15,610 |
| | | | 6,500 | 1,990 | 0.337 | 9,610 | 1,990 | 0.337 | 9,610 |
| | | 1 1/8" HS | 1,000 | 3,150 | 0.561 | 20,070 | 3,235 | 0.581 | 20,610 |
| | | | 3,500 | 2,670 | 0.468 | 15,610 | 2,670 | 0.469 | 15,610 |
| | | | 6,500 | 1,990 | 0.337 | 9,610 | 1,990 | 0.337 | 9,610 |
| HFX-32x11 | 128 1/4 | 7/8" STD | 1,000 | 1,535 | 0.488 | 8,040 | 1,535 | 0.488 | 8,040 |
| | | | 3,500 | 1,060 | 0.358 | 5,540 | 1,060 | 0.358 | 5,540 |
| | | | 6,500 | 485 | 0.211 | 2,540 | 485 | 0.212 | 2,540 |
| HFX-44x11 | 128 1/4 | 7/8" STD | 1,000 | 2,315 | 0.407 | 8,295 | 2,315 | 0.406 | 8,295 |
| | | | 3,500 | 1,615 | 0.290 | 5,795 | 1,615 | 0.289 | 5,795 |
| | | | 6,500 | 780 | 0.177 | 2,795 | 780 | 0.177 | 2,795 |
| HFX-15x12 | 140 1/4 | 1 1/8" STD | 1,000 | 915 | 0.614 | 11,565 | 1,170 | 0.779 | 14,870 |
| | | | 3,500 | 900 | | 10,005 | 1,140 | | 13,185 |
| | | | 6,500 | 880 | | 8,130 | 995 | | 9,610 |
| HFX-18x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,635 | 0.614 | 16,295 | 1,945 | 0.779 | 19,505 |
| | | | 3,500 | 1,580 | | 14,400 | 1,695 | | 15,610 |
| | | | 6,500 | 1,270 | | 9,610 | 1,270 | | 9,610 |
| HFX-21x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,830 | 0.614 | 14,900 | 2,215 | 0.779 | 18,155 |
| | | | 3,500 | 1,790 | | 13,270 | 2,070 | | 15,610 |
| | | | 6,500 | 1,545 | | 9,610 | 1,545 | | 9,610 |
| HFX-24x12 | 140 1/4 | 1 1/8" STD | 1,000 | 2,515 | 0.509 | 17,450 | 2,955 | 0.633 | 20,610 |
| | | | 3,500 | 2,440 | 0.510 | 15,610 | 2,440 | 0.511 | 15,610 |
| | | | 6,500 | 1,820 | 0.367 | 9,610 | 1,820 | 0.367 | 9,610 |
| | | 1 1/8" HS | 1,000 | 2,890 | 0.614 | 20,130 | 2,955 | 0.633 | 20,610 |
| | | | 3,500 | 2,440 | 0.510 | 15,610 | 2,440 | 0.511 | 15,610 |
| | | | 6,500 | 1,820 | 0.367 | 9,610 | 1,820 | 0.367 | 9,610 |
| HFX-32x12 | 140 1/4 | 7/8" STD | 1,000 | 1,405 | 0.556 | 8,040 | 1,405 | 0.556 | 8,040 |
| | | | 3,500 | 970 | 0.406 | 5,540 | 970 | 0.407 | 5,540 |
| | | | 6,500 | 445 | 0.238 | 2,540 | 445 | 0.238 | 2,540 |
| HFX-44x12 | 140 1/4 | 7/8" STD | 1,000 | 2,115 | 0.459 | 8,295 | 2,115 | 0.459 | 8,295 |
| | | | 3,500 | 1,480 | 0.327 | 5,795 | 1,480 | 0.327 | 5,795 |
| | | | 6,500 | 715 | 0.199 | 2,795 | 715 | 0.199 | 2,795 |
| HFX-15x13 | 152 1/4 | 1 1/8" STD | 1,000 | 835 | 0.666 | 11,425 | 1,065 | 0.846 | 14,695 |
| | | | 3,500 | 820 | | 9,865 | 1,045 | | 13,060 |
| | | | 6,500 | 805 | | 7,995 | 915 | | 9,610 |
| HFX-18x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,510 | 0.666 | 16,360 | 1,800 | 0.846 | 19,580 |
| | | | 3,500 | 1,460 | | 14,465 | 1,565 | | 15,610 |
| | | | 6,500 | 1,170 | | 9,610 | 1,170 | | 9,610 |
| HFX-21x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,670 | 0.666 | 14,765 | 2,025 | 0.846 | 18,030 |
| | | | 3,500 | 1,640 | | 13,170 | 1,905 | | 15,610 |
| | | | 6,500 | 1,425 | | 9,610 | 1,425 | | 9,610 |
| | | 1 1/8" HS | 1,000 | 1,730 | 0.666 | 15,305 | 2,080 | 0.846 | 18,510 |
| | | | 3,500 | 1,680 | | 13,555 | 1,905 | | 15,610 |
| | | | 6,500 | 1,425 | | 9,610 | 1,425 | | 9,610 |

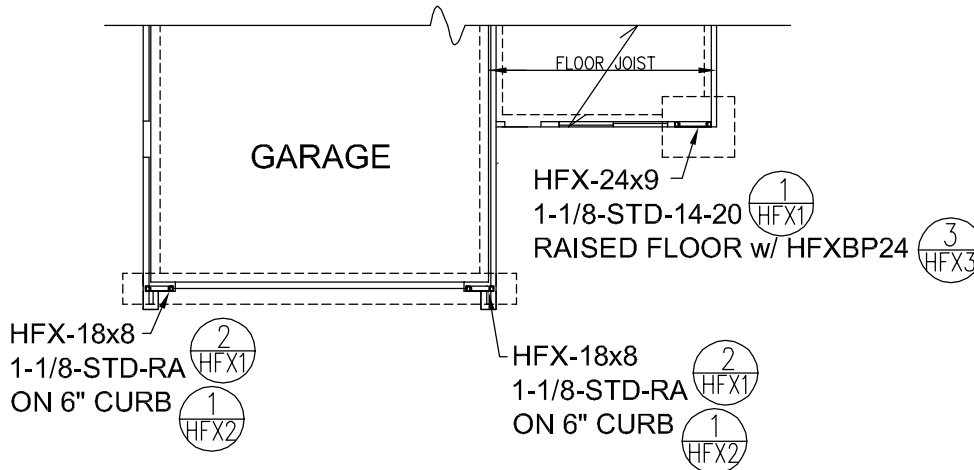
| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-24x13 | 152 1/4 | 1 1/8" STD | 1,000 | 2,360 | 0.566 | 17,785 | 2,725 | 0.684 | 20,610 |
| | | | 3,500 | 2,250 | 0.553 | 15,610 | 2,250 | 0.552 | 15,610 |
| | | | 6,500 | 1,675 | 0.397 | 9,610 | 1,675 | 0.397 | 9,610 |
| | | 1 1/8" HS | 1,000 | 2,670 | 0.666 | 20,180 | 2,725 | 0.684 | 20,610 |
| | | | 3,500 | 2,250 | 0.552 | 15,610 | 2,250 | 0.552 | 15,610 |
| | | | 6,500 | 1,675 | 0.397 | 9,610 | 1,675 | 0.397 | 9,610 |
| HFX-32x13 | 152 1/4 | 7/8" STD | 1,000 | 1,295 | 0.626 | 8,040 | 1,295 | 0.626 | 8,040 |
| | | | 3,500 | 890 | 0.457 | 5,540 | 890 | 0.457 | 5,540 |
| | | | 6,500 | 410 | 0.266 | 2,540 | 410 | 0.266 | 2,540 |
| HFX-44x13 | 152 1/4 | 7/8" STD | 1,000 | 1,950 | 0.516 | 8,295 | 1,950 | 0.516 | 8,295 |
| | | | 3,500 | 1,360 | 0.367 | 5,795 | 1,360 | 0.367 | 5,795 |
| | | | 6,500 | 655 | 0.221 | 2,795 | 655 | 0.221 | 2,795 |

For St: 1 inch = 25.4 mm, 1 lbf = 4.45 N

Notes

- 1) The values in this table are Allowable Stress Design (ASD) excluding a 1.33 stress increase and pertain to installation on Raised Floor Systems supported on concrete or masonry foundations.
- 2) Raised Floor System for Panels assumes a 2x wood sill plate, EWP rim board (Fc⊥ = 680 psi, 12 inch depth) with a Hardy Frame Bearing Plate installed below. For EWP rim boards up to 18 inches deep the allowable shear value must be multiplied by 0.96 for 12 inch Panel widths and by 0.98 for 18 and 24 inch widths. For all Panel widths the corresponding drift does not change. Raised Floor System for Brace Frames assume a 2x wood sill plate, EWP rim board (Fc⊥ = 680 psi, 12 inch deep), floor sheathing and a 2x wood bottom plate (Fc⊥ = 625 psi) below. For EWP rim boards up to 18 inches deep the allowable shear value does not change and the corresponding drift must be multiplied by 1.03.
- 3) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.
- 4) The applied vertical axial loads are concurrent with the allowable shear load. For Panels the axial load must be applied within the middle 1/3 of the Panel width or be uniformly distributed across the entire Panel width. For Brace Frame the axial load is acting along the centerline of the post.
- 5) Allowable Shear, Drift @ V and Uplift @ V values may be linearly interpolated for intermediate height or axial loads.
- 6) The Uplift values listed assume no resisting axial load. To determine the anchor tension load in Panels at design shear values and including the effect of axial loads, the tension load equals uplift minus P/2, where P is the axial load on the Panel. For Brace Frames the anchor tension load equals uplift minus P where P is the axial load on the Post.

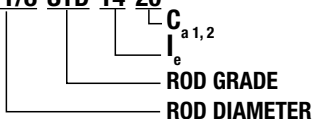
On Raised Floor Table 1.2A



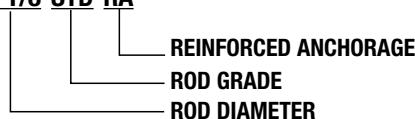
FOUNDATION PLAN

For referenced details see catalog pages 50-55

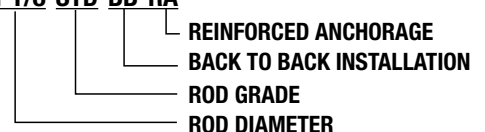
UNREINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-14-20

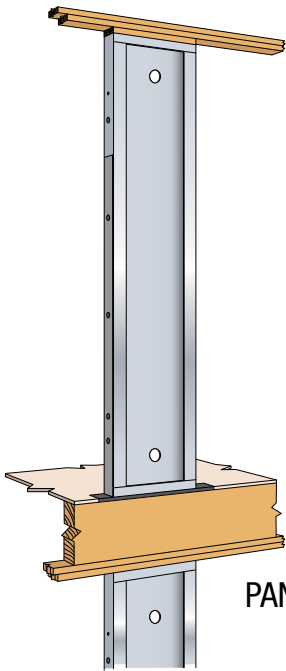


REINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-RA

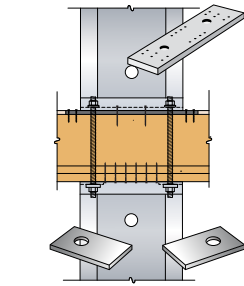


BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE
1 1/8-STD-BB-RA

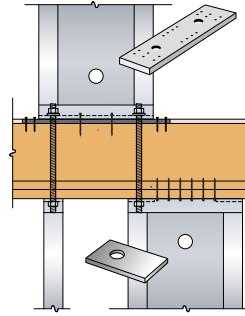




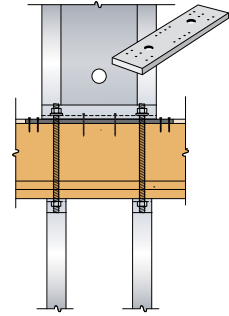
2x Filler
1/4 x 4 1/2" Screws



**Straight Stack Installation
With Stacking Panel (STK)
Below (Check Cumulative
Forces-See Example 2)**



**Stagger-Stack
Installation
With Stacking Panel
(STK) Below**



Two Posts Below

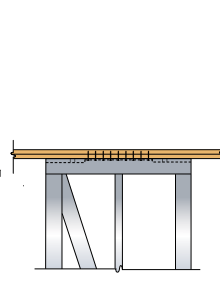
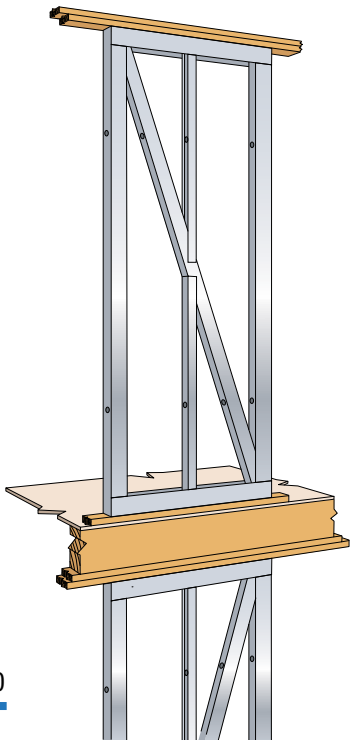
PANELS

Hardy Frame® "STK Washers" are required in the top of Panels when connecting to a hold down rod from above. Hardy Frame® "STK Panels" include STK Washers pre-welded in the top channel.

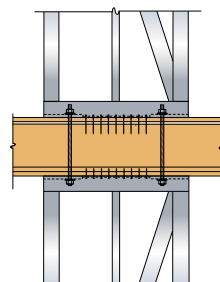
**MODEL NUMBER
HFX-18 x 9 - STK**

STACKING
NOMINAL HEIGHT
ACTUAL WIDTH
PRODUCT

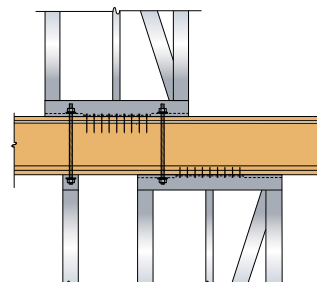
- Allowable values in Table 1.3A have been adjusted to maintain code drift limit while including the effects of crushing in wood members below.
- For "straight stack" installations, cumulative forces must be considered by the building design professional.
- For discontinuous systems, amplification factors must be considered by the Building Design Professional.
- Table values for Panels installed on a wood floor system assume installation of a Hardy Frame® Bearing Plate.
- For installations on beams, size plate washers on underside of wood beam to prevent crushing and include deflection from the overturning couple in the drift procedure.
- Because Brace Frames are wider, overturning forces cause less compression on wood below and shrinkage has less effect on horizontal drift.
- Unlike Panels, Brace Frames install on the bottom plate above floor systems. Hardy Frame® Bearing Plates are not necessary.



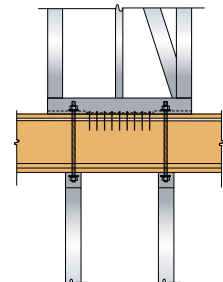
Top Plate



**Straight Stack Installation
(Check Cumulative Forces)**



**Stagger-Stack
Installation**



Two Posts Below

BRACE FRAMES

Table 1.3A Hardy Frame® Installation - on Upper Floors^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-12x78 | 78 | 1 1/8" STD | 1,000 | 1,245 | 0.341 | 10,930 | 1,590 | 0.433 | 14,075 |
| | | | 3,500 | 1,210 | | 9,340 | 1,550 | | 12,485 |
| | | | 6,500 | 1,165 | | 7,425 | 1,400 | | 9,610 |
| HFX-15x78 | 78 | 1 1/8" STD | 1,000 | 1,640 | 0.341 | 11,485 | 2,090 | 0.433 | 14,800 |
| | | | 3,500 | 1,600 | | 9,860 | 2,040 | | 13,085 |
| | | | 6,500 | 1,555 | | 7,905 | 1,790 | | 9,610 |
| HFX-18x78 | 78 | 1 1/8" STD | 1,000 | 2,665 | 0.341 | 14,715 | 3,225 | 0.388 | 17,920 |
| | | | 3,500 | 2,600 | | 13,035 | 3,050 | | 15,610 |
| | | | 6,500 | 2,285 | | 9,610 | 2,285 | | 9,610 |
| HFX-21x78 | 78 | 1 1/8" STD | 1,000 | 3,415 | 0.307 | 15,500 | 4,115 | 0.433 | 18,770 |
| | | | 3,500 | 3,305 | | 13,660 | 3,720 | | 15,610 |
| | | | 6,500 | 2,775 | | 9,610 | 2,775 | | 9,610 |
| HFX-24x78 | 78 | 1 1/8" STD | 1,000 | 3,830 | 0.290 | 14,700 | 5,105 | 0.289 | 19,770 |
| | | | 3,500 | | 0.257 | 13,395 | 4,385 | | 15,610 |
| | | | 6,500 | | 0.265 | 9,610 | 3,270 | | 9,610 |
| | | 1 1/8" HS | 1,000 | 0.341 | 18,420 | 5,315 | 0.392 | 20,610 | |
| | | | 3,500 | 0.319 | 15,610 | 4,385 | | 15,610 | |
| | | | 6,500 | 0.232 | 9,610 | 3,270 | | 9,610 | |
| HFX-12x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,065 | 0.404 | 11,060 | 1,355 | 0.512 | 14,205 |
| | | | 3,500 | 1,035 | | 9,460 | 1,325 | | 12,610 |
| | | | 6,500 | 995 | | 7,545 | 1,185 | | 9,610 |
| HFX-15x8 | 92 1/4 | 1 1/8" STD | 1,000 | 1,355 | 0.404 | 11,245 | 1,730 | 0.468 | 14,490 |
| | | | 3,500 | 1,325 | | 9,620 | 1,700 | | 12,865 |
| | | | 6,500 | 1,290 | | 7,680 | 1,510 | | 9,610 |
| HFX-18x8 | 92 1/4 | 1 1/8" STD | 1,000 | 2,275 | 0.404 | 14,875 | 2,740 | 0.512 | 18,030 |
| | | | 3,500 | 2,215 | | 13,145 | 2,580 | | 15,610 |
| | | | 6,500 | 1,930 | | 9,610 | 1,930 | | 9,610 |
| HFX-21x8 | 92 1/4 | 1 1/8" STD | 1,000 | 2,845 | 0.360 | 15,260 | 3,425 | 0.512 | 18,475 |
| | | | 3,500 | 2,760 | | 13,480 | 3,145 | | 15,610 |
| | | | 6,500 | 2,350 | | 9,610 | 2,350 | | 9,610 |
| HFX-24x8 | 92 1/4 | 1 1/8" STD | 1,000 | 3,420 | 0.404 | 15,555 | 4,495 | 0.460 | 20,610 |
| | | | 3,500 | | 0.319 | 14,250 | 3,710 | | 15,610 |
| | | | 6,500 | | 0.335 | 9,610 | 2,765 | | 9,610 |
| | | 1 1/8" HS | 1,000 | 0.404 | 18,555 | 4,495 | 0.461 | 20,610 | |
| | | | 3,500 | 0.374 | 15,610 | 3,710 | | 15,610 | |
| | | | 6,500 | 0.272 | 9,610 | 2,765 | | 9,610 | |
| HFX-32x8 | 92 1/4 | 7/8" STD | 1,000 | 2,135 | 0.321 | 8,040 | 2,135 | 0.321 | 8,040 |
| | | | 3,500 | 1,470 | | 5,540 | 1,470 | | 5,540 |
| | | | 6,500 | 675 | | 2,540 | 675 | | 2,540 |
| HFX-44x8 | 92 1/4 | 7/8" STD | 1,000 | 2,950 | 0.238 | 7,610 | 3,215 | 0.272 | 8,295 |
| | | | 3,500 | 2,245 | | 5,795 | 2,245 | | 5,795 |
| | | | 6,500 | 1,085 | | 2,795 | 1,085 | | 2,795 |
| | | 7/8" HS | 1,000 | 0.195 | 8,295 | 3,215 | 0.195 | 8,295 | |
| | | | 3,500 | 0.272 | 5,795 | 2,245 | | 5,795 | |
| | | | 6,500 | 0.122 | 2,795 | 1,085 | | 2,795 | |
| HFX-12x9 | 104 1/4 | 1 1/8" STD | 1,000 | 950 | 0.456 | 11,135 | 1,205 | 0.579 | 14,305 |
| | | | 3,500 | 920 | | 9,535 | 1,180 | | 12,705 |
| | | | 6,500 | 885 | | 7,615 | 1,050 | | 9,610 |
| HFX-15x9 | 104 1/4 | 1 1/8" STD | 1,000 | 1,185 | 0.456 | 11,065 | 1,510 | 0.533 | 14,265 |
| | | | 3,500 | 1,155 | | 9,450 | 1,480 | | 12,650 |
| | | | 6,500 | 1,125 | | 7,510 | 1,340 | | 9,610 |
| HFX-18x9 | 104 1/4 | 1 1/8" STD | 1,000 | 2,020 | 0.579 | 14,930 | 2,430 | 0.537 | 18,080 |
| | | | 3,500 | 1,965 | | 13,185 | 2,285 | | 15,610 |
| | | | 6,500 | 1,710 | | 9,610 | 1,710 | | 9,610 |
| HFX-21x9 | 104 1/4 | 1 1/8" STD | 1,000 | 2,480 | 0.405 | 15,015 | 2,995 | 0.579 | 18,260 |
| | | | 3,500 | 2,415 | | 13,305 | 2,785 | | 15,610 |
| | | | 6,500 | 2,080 | | 9,610 | 2,080 | | 9,610 |
| HFX-24x9 | 104 1/4 | 1 1/8" STD | 1,000 | 3,140 | 0.399 | 16,160 | 3,980 | 0.399 | 20,610 |
| | | | 3,500 | | 0.378 | 14,850 | 3,285 | | 15,610 |
| | | | 6,500 | | 0.395 | 9,610 | 2,450 | | 9,610 |
| | | 1 1/8" HS | 1,000 | 0.456 | 18,625 | 3,980 | 0.518 | 20,610 | |
| | | | 3,500 | 0.421 | 15,610 | 3,285 | | 15,610 | |
| | | | 6,500 | 0.306 | 9,610 | 2,450 | | 9,610 | |
| HFX-32x9 | 104 1/4 | 7/8" STD | 1,000 | 1,890 | 0.378 | 8,040 | 1,890 | 0.378 | 8,040 |
| | | | 3,500 | 1,300 | | 5,540 | 1,300 | | 5,540 |
| | | | 6,500 | 595 | | 2,540 | 595 | | 2,540 |
| HFX-44x9 | 104 1/4 | 7/8" STD | 1,000 | 2,845 | 0.279 | 8,005 | 2,845 | 0.318 | 8,295 |
| | | | 3,500 | 1,990 | | 5,795 | 1,990 | | 5,795 |
| | | | 6,500 | 960 | | 2,795 | 960 | | 2,795 |
| HFX-12x10 | 116 1/4 | 1 1/8" STD | 1,000 | 855 | 0.509 | 11,195 | 1,090 | 0.646 | 14,390 |
| | | | 3,500 | 830 | | 9,595 | 1,065 | | 12,790 |
| | | | 6,500 | 800 | | 7,675 | 940 | | 9,610 |
| HFX-15x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,045 | 0.592 | 10,910 | 1,335 | 0.646 | 14,065 |
| | | | 3,500 | 1,025 | | 9,295 | 1,310 | | 12,450 |
| | | | 6,500 | 995 | | 7,360 | 1,200 | | 9,610 |

Table 1.3A Hardy Frame® Installation - on Upper Floors^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ^{5,6} (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-18x10 | 116 1/4 | 1 1/8" STD | 1,000 | 1,825 | 0.509 | 15,040 | 2,190 | 0.646 | 18,165 |
| | | | 3,500 | 1,770 | | 13,255 | 2,050 | 0.616 | 15,610 |
| | | | 6,500 | 1,530 | | 9,610 | 1,530 | 0.449 | 9,610 |
| HFX-21x10 | 116 1/4 | 1 1/8" STD | 1,000 | 2,190 | 0.509 | 14,795 | 2,660 | 0.646 | 18,065 |
| | | | 3,500 | 2,145 | | 13,145 | 2,495 | 0.618 | 15,610 |
| | | | 6,500 | 1,865 | | 9,610 | 1,865 | 0.451 | 9,610 |
| HFX-24x10 | 116 1/4 | 1 1/8" STD | 1,000 | 2,900 | 0.436 | 16,655 | 3,565 | 0.573 | 20,610 |
| | | | 3,500 | | 0.456 | 15,350 | 2,945 | 0.465 | 15,610 |
| | | | 6,500 | | 0.338 | 9,610 | 2,195 | 0.338 | 9,610 |
| | | 1 1/8" HS | 1,000 | 3,240 | 0.509 | 18,680 | 3,565 | 0.575 | 20,610 |
| | | | 3,500 | 2,945 | 0.467 | 15,610 | 2,945 | 0.467 | 15,610 |
| | | | 6,500 | 2,195 | 0.340 | 9,610 | 2,195 | 0.340 | 9,610 |
| HFX-32x10 | 116 1/4 | 7/8" STD | 1,000 | 1,695 | 0.439 | 8,040 | 1,695 | 0.439 | 8,040 |
| | | | 3,500 | 1,170 | 0.323 | 5,540 | 1,170 | 0.323 | 5,540 |
| | | | 6,500 | 535 | 0.193 | 2,540 | 535 | 0.193 | 2,540 |
| HFX-44x10 | 116 1/4 | 7/8" STD | 1,000 | 2,550 | 0.367 | 8,295 | 2,550 | 0.366 | 8,295 |
| | | | 3,500 | 1,785 | 0.262 | 5,795 | 1,785 | 0.262 | 5,795 |
| | | | 6,500 | 860 | 0.162 | 2,795 | 860 | 0.162 | 2,795 |
| HFX-15x11 | 128 1/4 | 1 1/8" STD | 1,000 | 940 | 0.561 | 10,785 | 1,195 | 0.712 | 13,885 |
| | | | 3,500 | 915 | | 9,175 | 1,175 | | 12,270 |
| | | | 6,500 | 890 | | 7,240 | 1,090 | | 9,610 |
| HFX-18x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,660 | 0.561 | 15,100 | 1,985 | 0.712 | 18,160 |
| | | | 3,500 | 1,610 | | 13,300 | 1,855 | 0.680 | 15,610 |
| | | | 6,500 | 1,390 | | 9,610 | 1,390 | 0.495 | 9,610 |
| HFX-21x11 | 128 1/4 | 1 1/8" STD | 1,000 | 1,960 | 0.561 | 14,600 | 2,385 | 0.712 | 17,885 |
| | | | 3,500 | 1,925 | | 13,005 | 2,260 | 0.690 | 15,610 |
| | | | 6,500 | 1,690 | | 9,610 | 1,690 | 0.504 | 9,610 |
| HFX-24x11 | 128 1/4 | 1 1/8" STD | 1,000 | 2,695 | 0.496 | 17,090 | 3,235 | 0.629 | 20,610 |
| | | | 3,500 | 2,670 | 0.511 | 15,610 | 2,670 | 0.510 | 15,610 |
| | | | 6,500 | 1,990 | 0.372 | 9,610 | 1,990 | 0.371 | 9,610 |
| | | 1 1/8" HS | 1,000 | 2,960 | 0.561 | 18,815 | 3,235 | 0.630 | 20,610 |
| | | | 3,500 | 2,670 | 0.511 | 15,610 | 2,670 | 0.511 | 15,610 |
| | | | 6,500 | 1,990 | 0.371 | 9,610 | 1,990 | 0.372 | 9,610 |
| HFX-32x11 | 128 1/4 | 7/8" STD | 1,000 | 1,535 | 0.503 | 8,040 | 1,535 | 0.504 | 8,040 |
| | | | 3,500 | 1,060 | 0.370 | 5,540 | 1,060 | 0.370 | 5,540 |
| | | | 6,500 | 485 | 0.219 | 2,540 | 485 | 0.219 | 2,540 |
| HFX-44x11 | 128 1/4 | 7/8" STD | 1,000 | 2,315 | 0.419 | 8,295 | 2,315 | 0.418 | 8,295 |
| | | | 3,500 | 1,615 | 0.299 | 5,795 | 1,615 | 0.298 | 5,795 |
| | | | 6,500 | 780 | 0.183 | 2,795 | 780 | 0.183 | 2,795 |
| HFX-15x12 | 140 1/4 | 1 1/8" STD | 1,000 | 850 | 0.614 | 10,655 | 1,080 | 0.779 | 13,720 |
| | | | 3,500 | 830 | 9,045 | 1,060 | 12,110 | | |
| | | | 6,500 | 805 | 7,115 | 995 | 9,610 | | |
| HFX-18x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,525 | 0.614 | 15,165 | 1,825 | 0.779 | 18,275 |
| | | | 3,500 | 1,480 | | 13,350 | 1,695 | 0.738 | 15,610 |
| | | | 6,500 | 1,270 | | 9,610 | 1,270 | 0.537 | 9,610 |
| HFX-21x12 | 140 1/4 | 1 1/8" STD | 1,000 | 1,705 | 0.614 | 13,845 | 2,100 | 0.779 | 17,195 |
| | | | 3,500 | 1,675 | | 12,290 | 2,045 | 15,390 | |
| | | | 6,500 | 1,545 | | 9,610 | 1,545 | 0.579 | 9,610 |
| HFX-24x12 | 140 1/4 | 1 1/8" STD | 1,000 | 2,515 | 0.554 | 17,450 | 2,955 | 0.686 | 20,610 |
| | | | 3,500 | 2,440 | 0.556 | 15,610 | 2,440 | 0.557 | 15,610 |
| | | | 6,500 | 1,820 | 0.404 | 9,610 | 1,820 | 0.405 | 9,610 |
| | | 1 1/8" HS | 1,000 | 2,715 | 0.614 | 18,870 | 2,955 | 0.686 | 20,610 |
| | | | 3,500 | 2,440 | 0.557 | 15,610 | 2,440 | 0.557 | 15,610 |
| | | | 6,500 | 1,820 | 0.405 | 9,610 | 1,820 | 0.405 | 9,610 |
| HFX-32x12 | 140 1/4 | 7/8" STD | 1,000 | 1,405 | 0.572 | 8,040 | 1,405 | 0.573 | 8,040 |
| | | | 3,500 | 970 | 0.419 | 5,540 | 970 | 0.420 | 5,540 |
| | | | 6,500 | 445 | 0.247 | 2,540 | 445 | 0.247 | 2,540 |
| HFX-44x12 | 140 1/4 | 7/8" STD | 1,000 | 2,115 | 0.472 | 8,295 | 2,115 | 0.472 | 8,295 |
| | | | 3,500 | 1,480 | 0.337 | 5,795 | 1,480 | 0.337 | 5,795 |
| | | | 6,500 | 715 | 0.205 | 2,795 | 715 | 0.205 | 2,795 |
| HFX-15x13 | 152 1/4 | 1 1/8" STD | 1,000 | 775 | 0.666 | 10,535 | 985 | 0.846 | 13,565 |
| | | | 3,500 | 755 | | 8,930 | 965 | | 11,960 |
| | | | 6,500 | 735 | | 7,000 | 915 | | 9,610 |
| HFX-18x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,410 | 0.666 | 15,250 | 1,690 | 0.846 | 18,340 |
| | | | 3,500 | 1,365 | | 13,400 | 1,565 | 0.797 | 15,610 |
| | | | 6,500 | 1,170 | | 9,610 | 1,170 | 0.580 | 9,610 |
| HFX-21x13 | 152 1/4 | 1 1/8" STD | 1,000 | 1,555 | 0.666 | 13,725 | 1,925 | 0.846 | 17,080 |
| | | | 3,500 | 1,530 | | 12,175 | 1,870 | 15,280 | |
| | | | 6,500 | 1,425 | | 9,610 | 1,425 | 0.633 | 9,610 |
| HFX-24x13 | 152 1/4 | 1 1/8" STD | 1,000 | 2,360 | 0.616 | 17,785 | 2,725 | 0.742 | 20,610 |
| | | | 3,500 | 2,250 | 0.603 | 15,610 | 2,250 | 0.602 | 15,610 |
| | | | 6,500 | 1,675 | 0.438 | 9,610 | 1,675 | 0.438 | 9,610 |
| | | 1 1/8" HS | 1,000 | 2,505 | 0.666 | 18,915 | 2,725 | 0.742 | 20,610 |
| | | | 3,500 | 2,250 | 0.602 | 15,610 | 2,250 | 0.603 | 15,610 |
| | | | 6,500 | 1,675 | 0.438 | 9,610 | 1,675 | 0.438 | 9,610 |

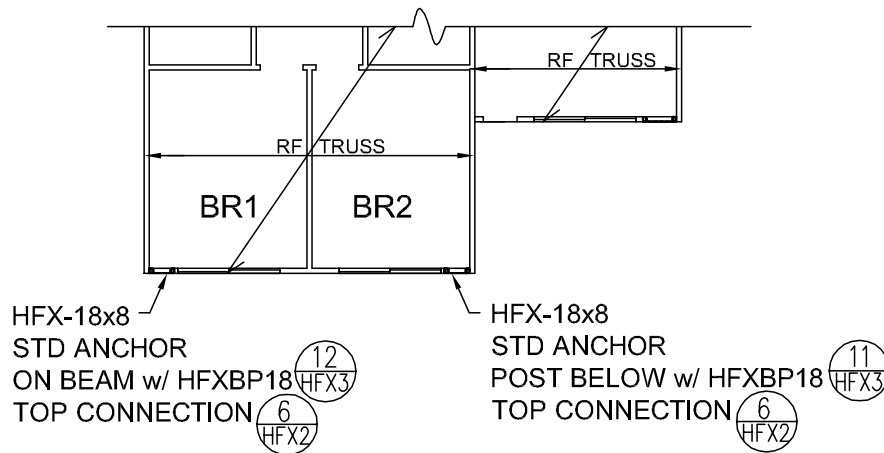
| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX-32x13 | 152 1/4 | 7/8" STD | 1,000 | 1,295 | 0.645 | 8,040 | 1,295 | 0.645 | 8,040 |
| | | | 3,500 | 890 | 0.471 | 5,540 | 890 | 0.471 | 5,540 |
| | | | 6,500 | 410 | 0.275 | 2,540 | 410 | 0.275 | 2,540 |
| HFX-44x13 | 152 1/4 | 7/8" STD | 1,000 | 1,950 | 0.530 | 8,295 | 1,950 | 0.530 | 8,295 |
| | | | 3,500 | 1,360 | 0.378 | 5,795 | 1,360 | 0.378 | 5,795 |
| | | | 6,500 | 655 | 0.228 | 2,795 | 655 | 0.229 | 2,795 |

For Sl: 1 inch = 25.4 mm, 1 lbf = 4.45 N

Notes

- 1) The values in this table are Allowable Stress Design (ASD) excluding a 1.33 stress increase and pertain to installation on Upper Floor Systems that bear on wood frame walls below.
- 2) Upper Floor System for Panels assumes double 2x wood sill plates in the wall below, EWP rim board (F_{c⊥} = 680 psi, 12 inch depth) with a Hardy Frame® Bearing Plate installed below. For EWP rim boards up to 18 inches deep the allowable shear value and the corresponding drift do not change. Upper Floor System for Brace Frames assumes double 2x wood plates in the wall below, EWP rim board (F_{c⊥} = 680 psi 12 inch deep), floor sheathing and a 2x wood bottom plate (F_{c⊥} = 625 psi) below. For EWP rim boards up to 18 inch deep the allowable shear value does not change and the corresponding drift must be multiplied by 1.03.
- 3) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.
- 4) The applied vertical axial loads are concurrent with the allowable shear load. For Panels the axial load must be applied within the middle 1/3 of the Panel width or be uniformly distributed across the entire Panel width. For Brace Frame the axial load is acting along the centerline of the post.
- 5) Allowable Shear, Drift @ V and Uplift @ V values may be linearly interpolated for intermediate height or axial loads.
- 6) The Uplift values listed assume no resisting axial load. To determine the anchor tension load in Panels at design shear values and including the effect of axial loads, the tension load equals uplift minus P/2, where P is the axial load on the Panel. For Brace Frames the anchor tension load equals uplift minus P where P is the axial load on the Post.

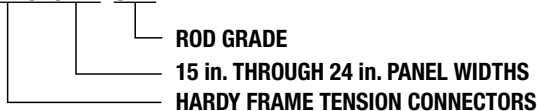
On Upper Floors Table 1.3A



2nd STORY FRAMING PLAN

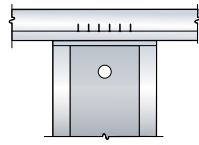
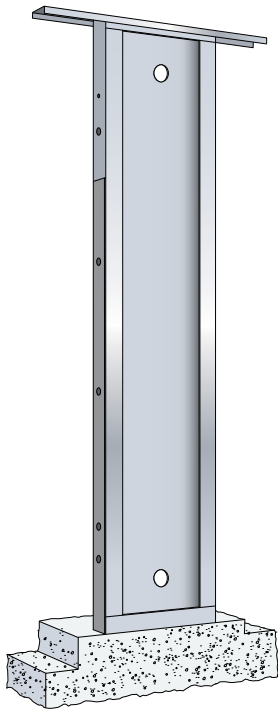
For referenced details see catalog pages 52-55

HFTC15-24 STD

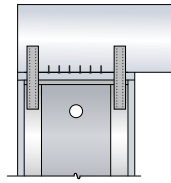


HFTC12 STD

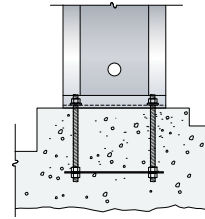




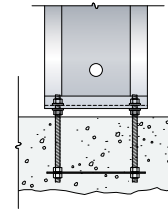
c-fs Channel



c-fs Portal



Concrete Bearing

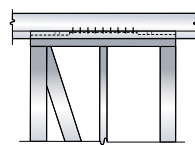
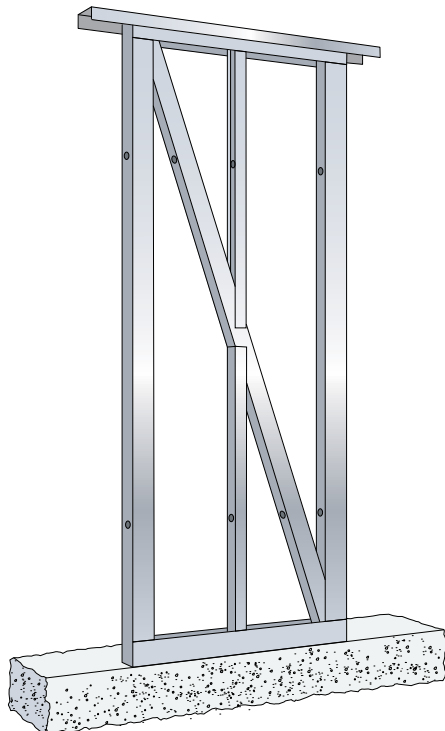


**Nuts And Washers
(Requires 5,000 psi
Non-Shrink Grout)**

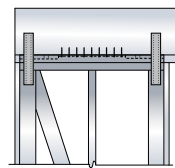
- HFX/S products are manufactured to cold formed steel stud heights. Nominal 8' heights are 96 5/8" net, nominal 9' is 108 5/8", etc.
- Installation can be directly on concrete (moisture barrier recommended), with a c-fs channel below, or a nut and washer for leveling or height adjustment up to $\pm 1-1/2"$
- Top connections are made with 1/4" diameter self tapping screws after installing floor or roof members above.
- Panels and Brace Frames are 3 1/2" net depth.

PANEL

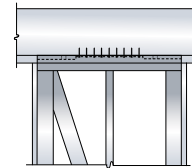
The new HFX Brace Frame has relocated hold down bolts to be outside of the post. Hold down connections are now accessible even when wood or framing is in contact with the edge of the frame.



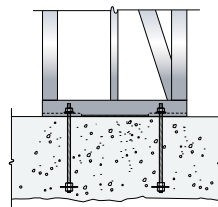
c-fs Channel



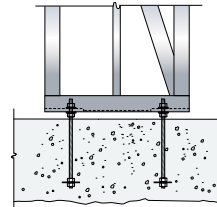
c-fs Portal



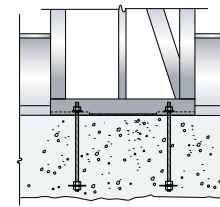
c-fs Portal



Concrete Bearing



**Nuts And Washers
(Requires 5,000 psi
Non-Shrink Grout)**



**Raised Floor
Head Out**

BRACE FRAME

Table 2.1A Hardy Frame® HFX/S Installation - on 2500 psi Concrete^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX/S-9x8 | 96 5/8 | 1 1/8" STD | 2,000 | 770 | 0.258 | 15,510 | 770 | 0.258 | 15,510 |
| HFX/S-12x8 | 96 5/8 | 1 1/8" STD | 1,000 | 1,410 | 0.213 | 19,595 | 1,410 | 0.213 | 19,595 |
| | | | 3,500 | 1,300 | 0.197 | 17,005 | 1,300 | 0.197 | 17,005 |
| | | | 6,500 | 1,160 | 0.176 | 14,320 | 1,160 | 0.176 | 14,320 |
| | | 1 1/8" HS | 1,000 | 1,410 | 0.214 | 19,595 | 1,410 | 0.214 | 19,595 |
| | | | 3,500 | 1,300 | 0.198 | 17,005 | 1,300 | 0.198 | 17,005 |
| | | | 6,500 | 1,160 | 0.177 | 14,320 | 1,160 | 0.177 | 14,320 |
| HFX/S-15x8 | 96 5/8 | 1 1/8" STD | 1,000 | 1,955 | 0.330 | 21,615 | 1,955 | 0.327 | 21,615 |
| | | | 3,500 | 1,945 | 0.327 | 21,380 | 1,945 | 0.325 | 21,380 |
| | | | 6,500 | 1,900 | 0.320 | 20,560 | 1,900 | 0.318 | 20,560 |
| | | 1 1/8" HS | 1,000 | 2,305 | 0.388 | 31,340 | 2,305 | 0.388 | 31,340 |
| | | | 3,500 | 2,160 | 0.364 | 26,150 | 2,160 | 0.364 | 26,150 |
| | | | 6,500 | 1,955 | 0.330 | 21,625 | 1,955 | 0.330 | 21,625 |
| HFX/S-18x8 | 96 5/8 | 1 1/8" STD | 1,000 | | | | | | |
| | | | 3,500 | 2,625 | 0.218 | 21,615 | 2,625 | 0.218 | 21,615 |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,570 | 0.298 | 39,500 | 3,570 | 0.299 | 39,500 |
| | | | 3,500 | 3,385 | 0.283 | 33,700 | 3,385 | 0.284 | 33,700 |
| | | | 6,500 | 3,135 | 0.262 | 28,745 | 3,135 | 0.263 | 28,745 |
| HFX/S-21x8 | 96 5/8 | 1 1/8" STD | 1,000 | | | | | | |
| | | | 3,500 | 3,210 | 0.272 | 21,090 | 3,210 | 0.272 | 21,090 |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 4,970 | 0.423 | 43,265 | 5,030 | 0.428 | 44,825 |
| | | | 3,500 | 4,875 | 0.415 | 41,070 | 4,875 | 0.415 | 41,070 |
| | | | 6,500 | 4,595 | 0.391 | 36,045 | 4,595 | 0.391 | 36,045 |
| HFX/S-24x8 | 96 5/8 | 1 1/8" STD | 1,000 | | | | | | |
| | | | 3,500 | 3,420 | 0.151 | 18,010 | 3,730 | 0.165 | 20,005 |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | | | | 6,450 | 0.288 | 45,290 |
| | | | 3,500 | 5,910 | 0.263 | 38,175 | 6,360 | 0.284 | 43,925 |
| | | | 6,500 | | | | 6,210 | 0.277 | 41,850 |
| HFX/S-32x8 | 96 5/8 | 7/8" STD | 1,000 | 2,265 | 0.133 | 8,540 | 2,825 | 0.165 | 10,630 |
| | | | 3,500 | 2,160 | 0.126 | 8,130 | 2,160 | 0.126 | 8,130 |
| | | | 6,500 | 1,360 | 0.080 | 5,130 | 1,360 | 0.080 | 5,130 |
| | | 7/8" HS | 1,000 | 3,000 | 0.176 | 11,295 | 3,000 | 0.176 | 11,295 |
| | | | 3,500 | 2,335 | 0.137 | 8,795 | 2,335 | 0.137 | 8,795 |
| | | | 6,500 | 1,540 | 0.090 | 5,795 | 1,540 | 0.090 | 5,795 |
| HFX/S-44x8 | 96 5/8 | 7/8" STD | 1,000 | 2,815 | 0.090 | 7,270 | 3,660 | 0.117 | 9,440 |
| | | | 3,500 | | | | 3,240 | 0.103 | 8,365 |
| | | | 6,500 | 2,080 | 0.066 | 5,365 | 2,080 | 0.066 | 5,365 |
| | | 7/8" HS | 1,000 | 4,510 | 0.144 | 11,645 | 4,510 | 0.144 | 11,645 |
| | | | 3,500 | 3,545 | 0.113 | 9,145 | 3,545 | 0.113 | 9,145 |
| | | | 6,500 | 2,380 | 0.076 | 6,145 | 2,380 | 0.076 | 6,145 |
| HFX/S-12x9 | 108 5/8 | 1 1/8" STD | 1,000 | 1,255 | 0.238 | 19,595 | 1,255 | 0.238 | 19,595 |
| | | | 3,500 | 1,155 | 0.220 | 17,005 | 1,155 | 0.220 | 17,005 |
| | | | 6,500 | 1,035 | 0.196 | 14,325 | 1,035 | 0.196 | 14,325 |
| | | 1 1/8" HS | 1,000 | 1,255 | 0.240 | 19,595 | 1,255 | 0.240 | 19,595 |
| | | | 3,500 | 1,155 | 0.221 | 17,005 | 1,155 | 0.221 | 17,005 |
| | | | 6,500 | 1,035 | 0.198 | 14,325 | 1,035 | 0.197 | 14,325 |
| HFX/S-15x9 | 108 5/8 | 1 1/8" STD | 1,000 | 1,740 | 0.381 | 21,615 | 1,740 | 0.379 | 21,615 |
| | | | 3,500 | 1,730 | 0.378 | 21,380 | 1,730 | 0.376 | 21,380 |
| | | | 6,500 | 1,690 | 0.370 | 20,560 | 1,690 | 0.367 | 20,560 |
| | | 1 1/8" HS | 1,000 | 2,050 | 0.449 | 31,340 | 2,050 | 0.449 | 31,340 |
| | | | 3,500 | 1,920 | 0.421 | 26,150 | 1,920 | 0.421 | 26,150 |
| | | | 6,500 | 1,740 | 0.381 | 21,625 | 1,740 | 0.381 | 21,625 |
| HFX/S-18x9 | 108 5/8 | 1 1/8" STD | 1,000 | | | | | | |
| | | | 3,500 | 2,335 | 0.246 | 21,615 | 2,335 | 0.246 | 21,615 |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,175 | 0.335 | 39,500 | 3,175 | 0.336 | 39,500 |
| | | | 3,500 | 3,015 | 0.318 | 33,700 | 3,015 | 0.318 | 33,700 |
| | | | 6,500 | 2,790 | 0.295 | 28,745 | 2,790 | 0.295 | 28,745 |
| HFX/S-21x9 | 108 5/8 | 1 1/8" STD | 1,000 | 2,925 | 0.319 | 21,545 | 2,925 | 0.319 | 21,545 |
| | | | 3,500 | 2,915 | 0.318 | 21,435 | 2,915 | 0.318 | 21,435 |
| | | | 6,500 | 2,905 | 0.317 | 21,345 | 2,905 | 0.317 | 21,345 |
| | | 1 1/8" HS | 1,000 | | | | 4,475 | 0.494 | 44,825 |
| | | | 3,500 | 4,305 | 0.475 | 40,285 | 4,340 | 0.479 | 41,070 |
| | | | 6,500 | 4,085 | 0.451 | 36,045 | 4,085 | 0.451 | 36,045 |
| HFX/S-24x9 | 108 5/8 | 1 1/8" STD | 1,000 | | | | | | |
| | | | 3,500 | 3,140 | 0.175 | 18,710 | 3,385 | 0.191 | 20,745 |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | | | | 5,775 | 0.325 | 45,935 |
| | | | 3,500 | 5,230 | 0.294 | 37,830 | 5,675 | 0.319 | 44,165 |
| | | | 6,500 | | | | 5,525 | 0.311 | 41,850 |

Table 2.1A Hardy Frame® HFX/S Installation - on 2500 psi Concrete^{1,2}

| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX/S-32x9 | 108 5/8 | 7/8" STD | 1,000 | 2,100 | 0.174 | 8,945 | 2,500 | 0.207 | 10,630 |
| | | | 3,500 | 1,910 | 0.158 | 8,130 | 1,910 | 0.158 | 8,130 |
| | | | 6,500 | 1,205 | 0.100 | 5,130 | 1,205 | 0.100 | 5,130 |
| | | 7/8" HS | 1,000 | 2,655 | 0.220 | 11,295 | 2,655 | 0.220 | 11,295 |
| | | | 3,500 | 2,065 | 0.171 | 8,795 | 2,065 | 0.171 | 8,795 |
| | | | 6,500 | 1,360 | 0.113 | 5,795 | 1,360 | 0.113 | 5,795 |
| HFX/S-44x9 | 108 5/8 | 7/8" STD | 1,000 | 2,635 | 0.116 | 7,680 | 3,405 | 0.151 | 9,930 |
| | | | 3,500 | 1,840 | 0.081 | 5,365 | 2,870 | 0.127 | 8,365 |
| | | | 6,500 | 1,840 | 0.081 | 5,365 | 1,840 | 0.081 | 5,365 |
| | | 7/8" HS | 1,000 | 3,995 | 0.177 | 11,645 | 3,995 | 0.177 | 11,645 |
| | | | 3,500 | 3,135 | 0.139 | 9,145 | 3,135 | 0.139 | 9,145 |
| | | | 6,500 | 2,105 | 0.093 | 6,145 | 2,105 | 0.093 | 6,145 |
| HFX/S-12x10 | 120 5/8 | 1 1/8" STD | 1,000 | 1,130 | 0.263 | 19,595 | 1,130 | 0.263 | 19,595 |
| | | | 3,500 | 1,040 | 0.243 | 17,005 | 1,040 | 0.243 | 17,005 |
| | | | 6,500 | 930 | 0.217 | 14,325 | 930 | 0.217 | 14,325 |
| | | 1 1/8" HS | 1,000 | 1,130 | 0.265 | 19,595 | 1,130 | 0.265 | 19,595 |
| | | | 3,500 | 1,040 | 0.244 | 17,005 | 1,040 | 0.244 | 17,005 |
| | | | 6,500 | 930 | 0.218 | 14,325 | 930 | 0.218 | 14,325 |
| HFX/S-15x10 | 120 5/8 | 1 1/8" STD | 1,000 | 1,565 | 0.434 | 21,620 | 1,565 | 0.431 | 21,620 |
| | | | 3,500 | 1,555 | 0.431 | 21,380 | 1,555 | 0.428 | 21,380 |
| | | | 6,500 | 1,520 | 0.421 | 20,560 | 1,520 | 0.418 | 20,560 |
| | | 1 1/8" HS | 1,000 | 1,845 | 0.511 | 31,340 | 1,845 | 0.511 | 31,340 |
| | | | 3,500 | 1,730 | 0.479 | 26,150 | 1,730 | 0.479 | 26,150 |
| | | | 6,500 | 1,565 | 0.434 | 21,625 | 1,565 | 0.434 | 21,625 |
| HFX/S-18x10 | 120 5/8 | 1 1/8" STD | 1,000 | 2,105 | 0.272 | 21,615 | 2,105 | 0.272 | 21,615 |
| | | | 3,500 | 2,860 | 0.372 | 39,500 | 2,860 | 0.372 | 39,500 |
| | | | 6,500 | 2,715 | 0.353 | 33,700 | 2,715 | 0.353 | 33,700 |
| | | 1 1/8" HS | 1,000 | 2,515 | 0.327 | 28,745 | 2,515 | 0.327 | 28,745 |
| | | | 3,500 | 2,640 | 0.364 | 21,620 | 2,640 | 0.364 | 21,620 |
| | | | 6,500 | 3,780 | 0.528 | 38,105 | 3,780 | 0.528 | 38,105 |
| HFX/S-21x10 | 120 5/8 | 1 1/8" STD | 1,000 | 3,680 | 0.514 | 36,045 | 3,680 | 0.514 | 36,045 |
| | | | 3,500 | 2,640 | 0.364 | 21,620 | 2,640 | 0.364 | 21,620 |
| | | | 6,500 | 4,030 | 0.562 | 44,825 | 4,030 | 0.562 | 44,825 |
| | | 1 1/8" HS | 1,000 | 3,905 | 0.545 | 41,070 | 3,905 | 0.545 | 41,070 |
| | | | 3,500 | 3,680 | 0.514 | 36,045 | 3,680 | 0.514 | 36,045 |
| | | | 6,500 | 3,150 | 0.216 | 21,385 | 3,150 | 0.216 | 21,385 |
| HFX/S-24x10 | 120 5/8 | 1 1/8" STD | 1,000 | 2,900 | 0.199 | 19,290 | 3,115 | 0.214 | 21,080 |
| | | | 3,500 | 2,900 | 0.199 | 19,290 | 3,105 | 0.213 | 20,985 |
| | | | 6,500 | 4,690 | 0.325 | 37,530 | 5,200 | 0.360 | 45,935 |
| | | 1 1/8" HS | 1,000 | 4,690 | 0.325 | 37,530 | 5,110 | 0.353 | 44,165 |
| | | | 3,500 | 4,975 | 0.344 | 41,850 | 4,975 | 0.344 | 41,850 |
| | | | 6,500 | 1,955 | 0.222 | 9,285 | 2,240 | 0.254 | 10,630 |
| HFX/S-32x10 | 120 5/8 | 7/8" STD | 1,000 | 1,715 | 0.194 | 8,130 | 1,715 | 0.194 | 8,130 |
| | | | 3,500 | 1,080 | 0.122 | 5,130 | 1,080 | 0.122 | 5,130 |
| | | | 6,500 | 1,080 | 0.122 | 5,130 | 1,080 | 0.122 | 5,130 |
| | | 7/8" HS | 1,000 | 2,380 | 0.270 | 11,295 | 2,380 | 0.269 | 11,295 |
| | | | 3,500 | 1,855 | 0.210 | 8,795 | 1,855 | 0.210 | 8,795 |
| | | | 6,500 | 1,220 | 0.138 | 5,795 | 1,220 | 0.138 | 5,795 |
| HFX/S-44x10 | 120 5/8 | 7/8" STD | 1,000 | 2,475 | 0.148 | 8,055 | 3,185 | 0.191 | 10,355 |
| | | | 3,500 | 1,650 | 0.099 | 5,365 | 2,575 | 0.154 | 8,365 |
| | | | 6,500 | 1,650 | 0.099 | 5,365 | 1,650 | 0.099 | 5,365 |
| | | 7/8" HS | 1,000 | 3,580 | 0.214 | 11,645 | 3,580 | 0.214 | 11,645 |
| | | | 3,500 | 2,810 | 0.168 | 9,145 | 2,810 | 0.168 | 9,145 |
| | | | 6,500 | 1,890 | 0.113 | 6,145 | 1,890 | 0.113 | 6,145 |
| HFX/S-15x11 | 132 5/8 | 1 1/8" STD | 1,000 | 1,425 | 0.486 | 21,615 | 1,425 | 0.485 | 21,615 |
| | | | 3,500 | 1,415 | 0.483 | 21,380 | 1,415 | 0.482 | 21,380 |
| | | | 6,500 | 1,385 | 0.471 | 20,560 | 1,385 | 0.471 | 20,560 |
| | | 1 1/8" HS | 1,000 | 1,680 | 0.573 | 31,340 | 1,680 | 0.573 | 31,340 |
| | | | 3,500 | 1,575 | 0.536 | 26,150 | 1,575 | 0.536 | 26,150 |
| | | | 6,500 | 1,425 | 0.486 | 21,625 | 1,425 | 0.486 | 21,625 |
| HFX/S-18x11 | 132 5/8 | 1 1/8" STD | 1,000 | 1,915 | 0.298 | 21,615 | 1,915 | 0.301 | 21,615 |
| | | | 3,500 | 2,600 | 0.406 | 39,500 | 2,600 | 0.406 | 39,500 |
| | | | 6,500 | 2,470 | 0.385 | 33,700 | 2,470 | 0.385 | 33,700 |
| | | 1 1/8" HS | 1,000 | 2,285 | 0.357 | 28,745 | 2,285 | 0.357 | 28,745 |
| | | | 3,500 | 2,405 | 0.410 | 21,620 | 2,405 | 0.410 | 21,620 |
| | | | 6,500 | 3,365 | 0.580 | 36,380 | 3,365 | 0.580 | 36,380 |
| HFX/S-21x11 | 132 5/8 | 1 1/8" STD | 1,000 | 3,345 | 0.577 | 36,045 | 3,345 | 0.577 | 36,045 |
| | | | 3,500 | 3,345 | 0.577 | 36,045 | 3,345 | 0.577 | 36,045 |
| | | | 6,500 | 3,345 | 0.577 | 36,045 | 3,345 | 0.577 | 36,045 |
| | | 1 1/8" HS | 1,000 | 3,665 | 0.632 | 44,825 | 3,665 | 0.632 | 44,825 |
| | | | 3,500 | 3,555 | 0.613 | 41,070 | 3,555 | 0.613 | 41,070 |
| | | | 6,500 | 3,345 | 0.577 | 36,045 | 3,345 | 0.577 | 36,045 |

Table 2.1A Hardy Frame® HFX/S Installation - on 2500 psi Concrete^{1,2}

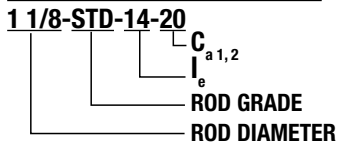
| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX/S-24x11 | 132 5/8 | 1 1/8" STD | 1,000 | 2,695 | 0.223 | 19,805 | 2,890 | 0.238 | 21,615 |
| | | | 3,500 | | | | 2,880 | 0.237 | 21,500 |
| | | | 6,500 | | | | 2,870 | 0.236 | 21,390 |
| | | 1 1/8" HS | 1,000 | 3,730 | 0.308 | 30,420 | 4,730 | 0.391 | 45,935 |
| | | | 3,500 | | | | 4,645 | 0.384 | 44,165 |
| | | | 6,500 | | | | 4,525 | 0.374 | 41,850 |
| HFX/S-32x11 | 132 5/8 | 7/8" STD | 1,000 | 1,830 | 0.276 | 9,595 | 2,030 | 0.306 | 10,630 |
| | | | 3,500 | 1,555 | 0.234 | 8,130 | 1,555 | 0.234 | 8,130 |
| | | | 6,500 | 980 | 0.147 | 5,130 | 980 | 0.148 | 5,130 |
| | | 7/8" HS | 1,000 | 2,160 | 0.325 | 11,295 | 2,160 | 0.325 | 11,295 |
| | | | 3,500 | 1,680 | 0.253 | 8,795 | 1,680 | 0.253 | 8,795 |
| | | | 6,500 | 1,105 | 0.167 | 5,795 | 1,105 | 0.167 | 5,795 |
| HFX/S-44x11 | 132 5/8 | 7/8" STD | 1,000 | 2,335 | 0.185 | 8,380 | 2,990 | 0.236 | 10,730 |
| | | | 3,500 | 2,330 | 0.184 | 8,365 | 2,330 | 0.184 | 8,365 |
| | | | 6,500 | 1,495 | 0.118 | 5,365 | 1,495 | 0.118 | 5,365 |
| | | 7/8" HS | 1,000 | 3,245 | 0.255 | 11,645 | 3,245 | 0.256 | 11,645 |
| | | | 3,500 | 2,550 | 0.201 | 9,145 | 2,550 | 0.201 | 9,145 |
| | | | 6,500 | 1,715 | 0.135 | 6,145 | 1,715 | 0.135 | 6,145 |
| HFX/S-15x12 | 144 5/8 | 1 1/8" STD | 1,000 | 1,305 | 0.541 | 21,615 | 1,305 | 0.540 | 21,615 |
| | | | 3,500 | 1,300 | 0.537 | 21,380 | 1,300 | 0.536 | 21,380 |
| | | | 6,500 | 1,270 | 0.525 | 20,560 | 1,270 | 0.524 | 20,560 |
| | | 1 1/8" HS | 1,000 | 1,530 | 0.633 | 30,485 | 1,540 | 0.638 | 31,340 |
| | | | 3,500 | 1,445 | 0.597 | 26,150 | 1,445 | 0.597 | 26,150 |
| | | | 6,500 | 1,305 | 0.541 | 21,625 | 1,305 | 0.541 | 21,625 |
| HFX/S-18x12 | 144 5/8 | 1 1/8" STD | 1,000 | 1,755 | 0.324 | 21,615 | 1,755 | 0.324 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 2,385 | 0.442 | 39,500 | 2,385 | 0.442 | 39,500 |
| | | | 3,500 | 2,265 | 0.419 | 33,700 | 2,265 | 0.419 | 33,700 |
| | | | 6,500 | 2,095 | 0.388 | 28,745 | 2,095 | 0.388 | 28,745 |
| HFX/S-21x12 | 144 5/8 | 1 1/8" STD | 1,000 | 2,205 | 0.456 | 21,615 | 2,205 | 0.456 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,030 | 0.633 | 35,115 | 3,360 | 0.702 | 44,825 |
| | | | 3,500 | | | | 3,260 | 0.681 | 41,070 |
| | | | 6,500 | | | | 3,070 | 0.641 | 36,045 |
| HFX/S-24x12 | 144 5/8 | 1 1/8" STD | 1,000 | 2,515 | 0.246 | 20,235 | 2,650 | 0.260 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,410 | 0.334 | 30,285 | 4,335 | 0.425 | 45,935 |
| | | | 3,500 | | | | 4,260 | 0.418 | 44,165 |
| | | | 6,500 | | | | 4,150 | 0.407 | 41,850 |
| HFX/S-32x12 | 144 5/8 | 7/8" STD | 1,000 | 1,720 | 0.337 | 9,855 | 1,855 | 0.364 | 10,630 |
| | | | 3,500 | 1,420 | 0.278 | 8,130 | 1,420 | 0.278 | 8,130 |
| | | | 6,500 | 895 | 0.175 | 5,130 | 895 | 0.175 | 5,130 |
| | | 7/8" HS | 1,000 | 1,975 | 0.386 | 11,295 | 1,975 | 0.386 | 11,295 |
| | | | 3,500 | 1,535 | 0.300 | 8,795 | 1,535 | 0.300 | 8,795 |
| | | | 6,500 | 1,010 | 0.198 | 5,795 | 1,010 | 0.198 | 5,795 |
| HFX/S-44x12 | 144 5/8 | 7/8" STD | 1,000 | 2,210 | 0.224 | 8,675 | 2,770 | 0.281 | 10,865 |
| | | | 3,500 | 2,135 | 0.216 | 8,365 | 2,135 | 0.216 | 8,365 |
| | | | 6,500 | 1,370 | 0.139 | 5,365 | 1,370 | 0.139 | 5,365 |
| | | 7/8" HS | 1,000 | 2,970 | 0.301 | 11,645 | 2,970 | 0.302 | 11,645 |
| | | | 3,500 | 2,330 | 0.237 | 9,145 | 2,330 | 0.237 | 9,145 |
| | | | 6,500 | 1,565 | 0.159 | 6,145 | 1,565 | 0.159 | 6,145 |
| HFX/S-15x13 | 156 5/8 | 1 1/8" STD | 1,000 | 1,205 | 0.597 | 21,615 | 1,205 | 0.597 | 21,615 |
| | | | 3,500 | 1,200 | 0.593 | 21,380 | 1,200 | 0.593 | 21,380 |
| | | | 6,500 | 1,170 | 0.579 | 20,560 | 1,170 | 0.579 | 20,560 |
| | | 1 1/8" HS | 1,000 | 1,385 | 0.685 | 28,750 | 1,420 | 0.704 | 31,340 |
| | | | 3,500 | 1,330 | 0.659 | 26,150 | 1,330 | 0.659 | 26,150 |
| | | | 6,500 | 1,205 | 0.597 | 21,625 | 1,205 | 0.597 | 21,625 |
| HFX/S-18x13 | 156 5/8 | 1 1/8" STD | 1,000 | 1,620 | 0.348 | 21,615 | 1,620 | 0.348 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 2,205 | 0.477 | 39,500 | 2,205 | 0.477 | 39,500 |
| | | | 3,500 | 2,090 | 0.452 | 33,700 | 2,090 | 0.452 | 33,700 |
| | | | 6,500 | 1,935 | 0.419 | 28,745 | 1,935 | 0.419 | 28,745 |
| HFX/S-21x13 | 156 5/8 | 1 1/8" STD | 1,000 | 2,035 | 0.503 | 21,615 | 2,035 | 0.503 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 2,745 | 0.685 | 33,895 | 3,105 | 0.775 | 44,825 |
| | | | 3,500 | | | | 3,010 | 0.751 | 41,070 |
| | | | 6,500 | | | | 2,835 | 0.708 | 36,045 |

Table 2.1A Hardy Frame® HFX/S Installation - on 2500 psi Concrete^{1,2}

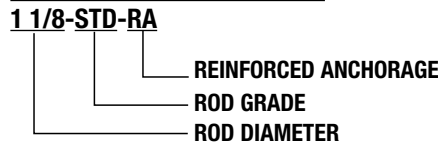
| Model Number | Net Height H (in) | HD Bolt Dia (in) and Grade ³ | Applied Axial Load ⁴ | Seismic | | | Wind | | |
|--------------|-------------------|---|---------------------------------|---|------------------------------|----------------------------------|---|------------------------------|----------------------------------|
| | | | | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) | Allowable In-Plane Shear V ⁵ (lbs) | Drift at V ⁵ (in) | Uplift at V ^{5,6} (lbs) |
| HFX/S-24x13 | 156 5/8 | 1 1/8" STD | 1,000 | 2,360 | 0.271 | 20,645 | 2,450 | 0.281 | 21,615 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 1 1/8" HS | 1,000 | 3,140 | 0.360 | 30,160 | 4,005 | 0.459 | 45,935 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| HFX/S-32x13 | 156 5/8 | 7/8" STD | 1,000 | 1,625 | 0.403 | 10,090 | 1,710 | 0.425 | 10,630 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 7/8" HS | 1,000 | 1,820 | 0.452 | 11,295 | 1,820 | 0.452 | 11,295 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| HFX/S-44x13 | 156 5/8 | 7/8" STD | 1,000 | 2,100 | 0.269 | 8,940 | 2,550 | 0.327 | 10,865 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |
| | | 7/8" HS | 1,000 | 2,735 | 0.351 | 11,645 | 2,735 | 0.351 | 11,645 |
| | | | 3,500 | | | | | | |
| | | | 6,500 | | | | | | |

For Sl: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb = 4.45 N, 1 psi 6.89 kPa.

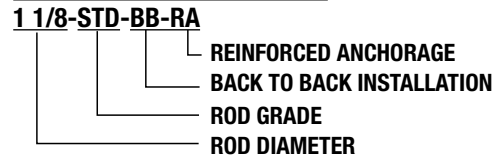
UNREINFORCED ANCHORAGE NOMENCLATURE



REINFORCED ANCHORAGE NOMENCLATURE

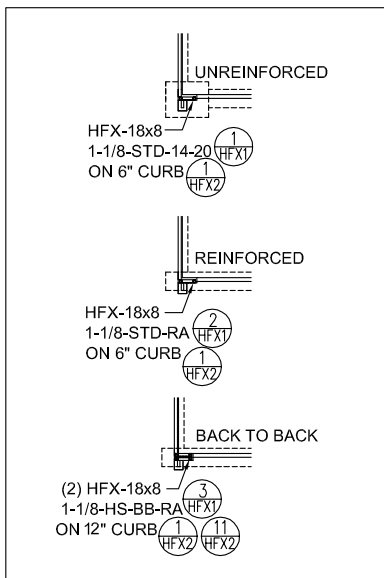


BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE

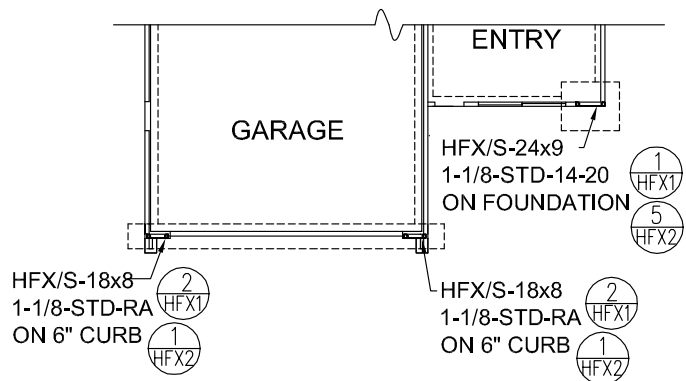


Notes

- 1) The values in this table are Allowable Stress Design (ASD) excluding a 1.33 stress increase and pertain to installation on 2500 psi concrete or nut & washer with 5,000 psi minimum non-shrink grout.
- 2) For installation on a nut & washer (only) table values must be multiplied by 0.80.
- 3) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.
- 4) The additional vertical axial loads are concurrent with the allowable shear load. For Panels the axial load must be applied within the middle 1/3 of the Panel width or be uniformly distributed across the entire Panel width. For Brace Frame the axial load is acting and along the centerline of the post.
- 5) Allowable Shear, Drift @ V and Uplift @ V values may be linearly interpolated for intermediate height or axial loads.
- 6) The Uplift values listed assume no resisting axial load. To determine anchor tension loads in Panels at design shear values and including the effect of axial loads, refer to the equation on page 40 of this catalog. For Brace Frames the anchor tension load equals uplift minus P, where P is the axial load in the Post.



HFX/S Table 2.1A



FOUNDATION PLAN

For referenced details see catalog pages 50-53

Hardy Frame® HFX Panels in Prescriptive Braced Walls - 2012 IRC Code Compliance and Manufacturer Recommendations

To resist **wind** and **seismic** loads strategic wall lines must be structurally braced. The International Residential Code (IRC) provides prescriptive guidelines for bracing conventional light frame structures that must consider the following:

- 1) Identify wall lines that require bracing**
- 2) Determine Braced Wall Panel locations and quantities**
- 3) Select construction method, or material for Braced Wall Panels in each wall line and calculate the length of bracing required.**

1) Identify Wall Lines

As a general rule, all exterior walls shall be braced wall lines. Additionally, when parallel braced wall line spacing exceeds the Code limit, intermediate braced wall lines are required. For maximum braced wall line spacing refer to **Table R602.10.1.3** on page 164 of the 2012 IRC Code.

2) Determine Locations and Quantities

- For wind loading and for Seismic Design Categories A through C, Braced Wall Panels (BWPs) must be located 10 feet or less from each end of a braced wall line and the distance between adjacent edges shall not exceed 20 feet. For Seismic Design Category D0, D1 and D2 BWPs must be located at each end although there are exceptions depending on the Method of bracing. BWP at each end of wall line is always recommended.
- Braced wall lines lengths of 16 feet or less may be braced with a single BWP provided it is 48 inches or greater in width. When a 48 inch BWP width is not available a minimum quantity of two BWPs is required.
- For required bracing length refer to **R602.10.3**

3) Determine effective Bracing Methods and Material

Refer to Table R602.10.4

The Hardy Frame® Recommended Bracing Method

Garage Fronts:

For "Portal" framing (garage header extends over top of Panel) – HFX-9x79.5
For shear transfer at top plates of a 8 foot nominal wall height – HFX-9x8
For shear transfer at top plates of a 9 foot nominal wall height – HFX-12x9
For shear transfer at top plates of a 10 foot nominal wall height – HFX-12x10

Other Areas:

For shear transfer at top plates of a 8 foot nominal wall height – HFX-9x8
For shear transfer at top plates of a 9 foot nominal wall height – HFX-12x9
For shear transfer at top plates of a 10 foot nominal wall height – HFX-12x10

For Panel anchorage, bottom connection and top connection details refer to the **Hardy Frame®** Typical Installation Details.
For stacked conditions consult with the Building Designer or Hardy Frame.

Equation for tension uplift with added axial load

The expressions listed below may be used to determine uplift tension (T) with the additional axial load P_{add} .

Hardy Frame® Panels

$$\text{HFX 9x: } T = 8.6 f'_c - \sqrt{74.4 f_c'^2 - 1.19 f_c' (5.5 P_{add} + 2VH)} - P_{add}$$

$$\text{HFX 12x: } T = 12.2 f'_c - \sqrt{148.8 f_c'^2 - 1.19 f_c' (8.50 P_{add} + 2VH)} - P_{add}$$

$$\text{HFX 15x: } T = 14.7 f'_c - \sqrt{216.9 f_c'^2 - 1.19 f_c' (9.75 P_{add} + 2VH)} - P_{add}$$

$$\text{HFX 18x: } T = 18.3 f'_c - \sqrt{334.8 f_c'^2 - 1.19 f_c' (12.8 P_{add} + 2VH)} - P_{add}$$

$$\text{HFX 21x: } T = 21.9 f'_c - \sqrt{478.1 f_c'^2 - 1.19 f_c' (15.8 P_{add} + 2VH)} - P_{add}$$

$$\text{HFX 24x: } T = 25.4 f'_c - \sqrt{647.0 f_c'^2 - 1.19 f_c' (18.8 P_{add} + 2VH)} - P_{add}$$

| Variable | Description/Units |
|-----------|-----------------------------------|
| f'_c | Concrete Compression Stress / psi |
| V | Shear Load / lbs. |
| H | Panel Height / in. |
| P_{add} | Vertical Load / lbs. |

Example 1: Combine HFX Panels of different stiffness in the same wall line by proportioning loads.

Given:

2012 IBC, Seismic loading
 Concrete $f'_c = 2,500$ psi
 Design Shear Load = 5,500 lbs.
 Axial Load = 1,000 lbs per Panel
 Wall height = 8'1"

Try: (2) HFX-12x8 with (1) HFX-18x8

Step 1: Calculate Stiffness (k)

For HFX12x8: Allowable Shear from Table 1.1A (HS grade HD) = 1,480 lbs
 Corresponding Drift = 0.225 in
 Stiffness (k_{12}) = 1,480 / 0.225 = 6,578 lbs/in

For HFX18x8: Allowable Shear from Table 1.1A (HS grade HD) = 3,740 lbs
 Corresponding Drift = 0.312 in
 Stiffness (k_{18}) = 3,740 / 0.312 = 11,987 lbs/in

$$\text{Total Stiffness } (k_{total}) = k_{12} + k_{12} + k_{18} = 6,578 \text{ lbs/in} + 6,578 \text{ lbs/in} + 11,987 \text{ lbs/in} = 25,143 \text{ lbs/in}$$

Step 2: Calculate Relative Stiffness

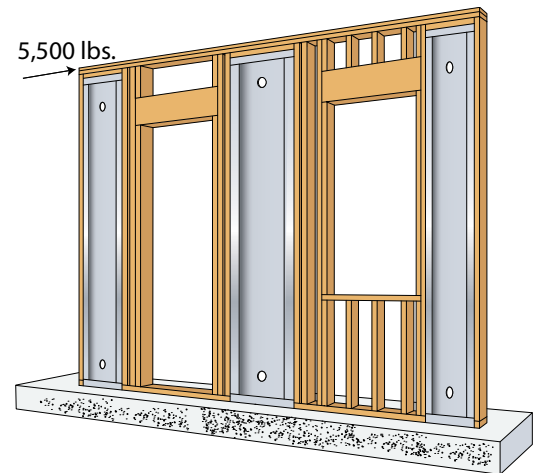
$$k_{12} / k_{total} = 6,578 / 25,143 = 0.26$$

$$k_{18} / k_{total} = 11,987 / 25,143 = 0.48$$

Step 3: Check Load Distribution

$$\text{HFX-12x8} = 0.26 \times 5,500 \text{ lbs} = 1,430 \text{ lbs} < 1,480 \text{ lbs} \quad \text{OK}$$

$$\text{HFX-18x8} = 0.48 \times 5,500 \text{ lbs} = 2,640 \text{ lbs} < 3,740 \text{ lbs} \quad \text{OK}$$



Example 2: Designing for stacked Hardy Frame® Panels or Brace Frames

Given

2012 IBC, Wind Loading, Concrete $f'_c = 2,500$ psi

1st Floor Wall Height: 9' 1"

Floor System Depth: 1' 0"

2nd Floor Wall Height: 8' 1"

Shear Load at 1st Floor (V_1): 1,000 lbs Wind

Shear Load at 2nd Floor (V_2): 1,000 lbs Wind

Shear Load at Foundation (V_{base}): 2,000 lbs Wind (1,000 lbs + 1,000 lbs)

No Additional Vertical Loads

Step 1. Select

HFX-18x8 (STD Rods) at Second Floor: Allowable Wind Shear from Table 1.3A = 2,740 lbs

HFX-18x9 (HS Rods) at First Floor: Allowable Wind Shear from Table 1.1A = 3,310 lbs

Step 2. Check Shear

A) Shear at the Second Floor (V_2)

HFX-18x8 Allowable Shear = 2,740 lbs > 1,000 lbs **OK**

B) Shear at the Foundation (V_{base})

HFX-18x9 Allowable Shear = 3,310 lbs > 2,000 lbs **OK**

Step 3. Check Moment

A) Calculate Cumulative Overturning Moment of the Stacked Panels

Second Floor @ 18' 2" = 218 in x 1,000 lbs = 218,000 in-lbs

First Floor @ 9' 1" = 109 in x 1,000 lbs = 109,000 in-lbs

Total Calculated Overturning Moment = 327,000 in-lbs.

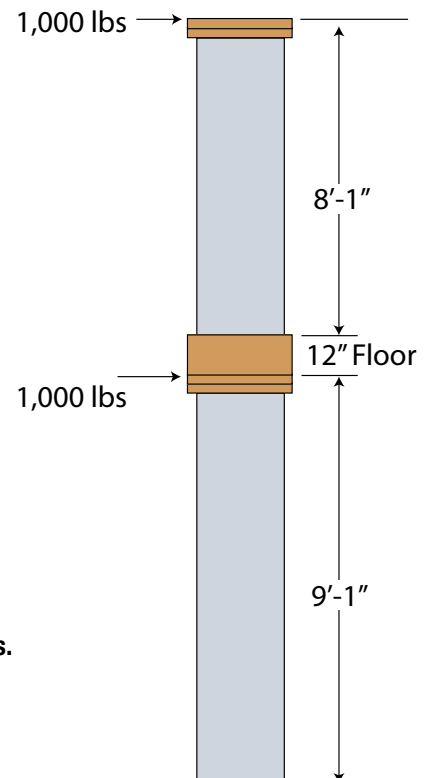
B) Calculate Moment Capacity of the Stacked Panels

Use the First Floor Panel Moment Capacity as the Capacity of the Stacked Panels

Allowable Moment = Allowable Shear x Panel Height = 3,310 lbs x 104.25in = 345,068 in-lbs.

C) Check Cumulative Overturning Moment

345,068 in-lbs (Capacity) > 327,000 in-lbs (Cumulative moment) **OK**



Step 4. Foundation Anchor Tension

$$\frac{\text{Calculated Overturning Moment}}{\text{Allowable Moment}} \times \text{Uplift at Allowable Moment} = \frac{327,000 \text{ in-lbs}}{345,068 \text{ in-lbs}} \times 39,477 \text{ lbs} = 37,410 \text{ lbs}$$





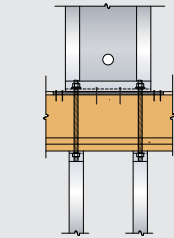
Hardy Frame® Post

The Hardy Frame HFP and HFP/S Post are now available in 7/8 inch diameter hold down rods for connecting to Brace Frames above and in 1-1/8 inch diameter for connecting to Panels above.

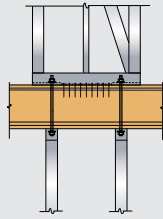
Tables provide tensile values for standard grade (STD) and for High Strength (HS) hold down rods. Be sure to include the embed callout on the foundation plan.

The access holes to both the bottom and the top hold down rods are now located on the same edge of the post.

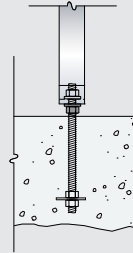
All Posts are 3 1/2" x 3 1/2" square and are fabricated from 12 gage steel. Custom heights up to the maximum listed in the table are available.



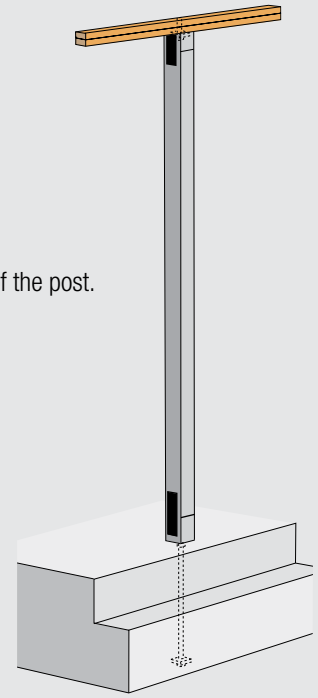
Hardy Frame® Panel to two Hardy Frame® Posts below



Hardy Frame® Brace Frame to two Hardy Frame® Posts below



Hardy Frame® Post on nut and washer (requires 5,000 psi non-shrink grout)



| Model Number | Net Height (in) | HD Dia (in) | Allowable Compression ^{3,4,5} (lbs) | STD Allowable Tension ⁶ (lbs) | HS Allowable Tension ⁶ (lbs) |
|---------------|-----------------|-------------|--|--|---|
| HFP | | | | | |
| HFP8-7/8 | 92 1/4 | 7/8 | 24,735 | 13,080 | 28,185 |
| HFP8-1 1/8 | 92 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP9-7/8 | 104 1/4 | 7/8 | 22,325 | 13,080 | 28,185 |
| HFP9-1 1/8 | 104 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP10-7/8 | 116 1/4 | 7/8 | 19,900 | 13,080 | 28,185 |
| HFP10-1 1/8 | 116 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP11-7/8 | 128 1/4 | 7/8 | 17,520 | 13,080 | 28,185 |
| HFP11-1 1/8 | 128 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP12-7/8 | 140 1/4 | 7/8 | 15,230 | 13,080 | 28,185 |
| HFP12-1 1/8 | 140 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP13-7/8 | 152 1/4 | 7/8 | 13,050 | 13,080 | 28,185 |
| HFP13-1 1/8 | 152 1/4 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S | | | | | |
| HFP/S8-7/8 | 96 5/8 | 7/8 | 23,865 | 13,080 | 28,185 |
| HFP/S8-1 1/8 | 96 5/8 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S9-7/8 | 108 5/8 | 7/8 | 21,440 | 13,080 | 28,185 |
| HFP/S9-1 1/8 | 108 5/8 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S10-7/8 | 120 5/8 | 7/8 | 19,025 | 13,080 | 28,185 |
| HFP/S10-1 1/8 | 120 5/8 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S11-7/8 | 132 5/8 | 7/8 | 16,670 | 13,080 | 28,185 |
| HFP/S11-1 1/8 | 132 5/8 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S12-7/8 | 144 5/8 | 7/8 | 14,430 | 13,080 | 28,185 |
| HFP/S12-1 1/8 | 144 5/8 | 1 1/8 | | 21,620 | 35,275 |
| HFP/S13-7/8 | 156 5/8 | 7/8 | 12,330 | 13,080 | 28,185 |
| HFP/S13-1 1/8 | 156 5/8 | 1 1/8 | | 21,620 | 35,275 |

1) The values in this table are Allowable Stress Design (ASD), exclude a 1.33 stress increase, and assume installations on a rigid base, or a nut and washer with non-shrink grout of 5000 psi minimum compressive strength.

2) The HFP is used to transfer tension and compression loads from Panels or Brace Frames on upper floors. The amplification factor (Ω) for discontinuous lateral systems does need to be applied.

3) The maximum allowable compression of the post is limited as follows:

- A) Wood with 625 psi allowable compression perpendicular to grain = 7,656 lbs.
- B) Wood with 680 psi allowable compression perpendicular to grain = 8,330 lbs.
- C) 2500 psi Concrete = 10,412 lbs.
- D) 3000 psi Concrete = 12,495 lbs.
- E) 4000 psi Concrete = 16,660 lbs.

4) For installation on supporting materials other than noted above, the Design Professional must check the Bearing Stress based on the Post bearing area of 12.25 square inches.

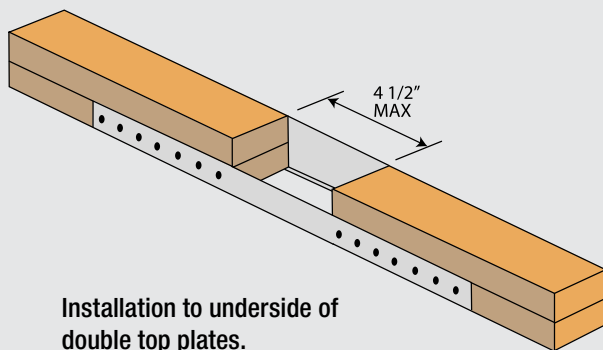
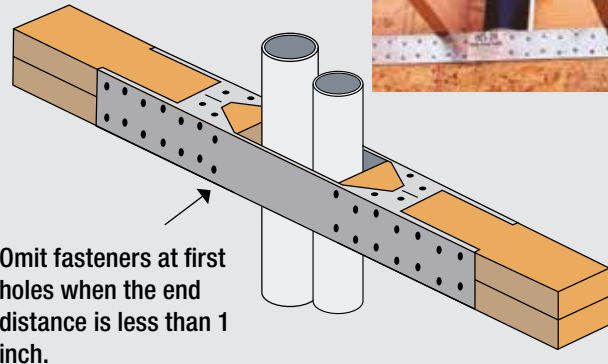
5) For compression loads exceeding the allowable bearing stress of the supporting material the Building Design Professional is permitted to design bearing plates to increase the bearing area in order to reduce the bearing stress.

6) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.

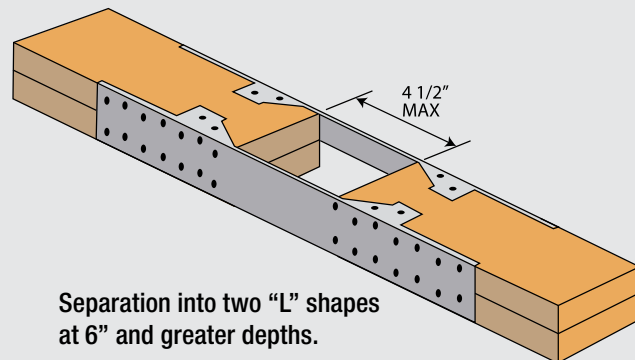
For Sl: 1 inch = 25.4 mm, 1 lbf = 4.45 N

Hardy Frame® Saddle

The Hardy Frame® Saddle (HFS) is a 14 gauge steel channel intended to be used as a splice at locations where plumbing or other vertical penetrations destroy the structural integrity of a wall's top plates. The Saddle can be installed over the top or from the underside of the top plates, and is capable of resisting both tension and compression loads in a clearspan of up to 4-1/2" inches. For wall depths greater than 3-1/2", or to install after plumbing lines have been run, the product can be separated into two "L" shapes by gripping the legs of the channel and flexing the top surface along the serration lines.



Installation to underside of double top plates.



Separation into two "L" shapes at 6" and greater depths.

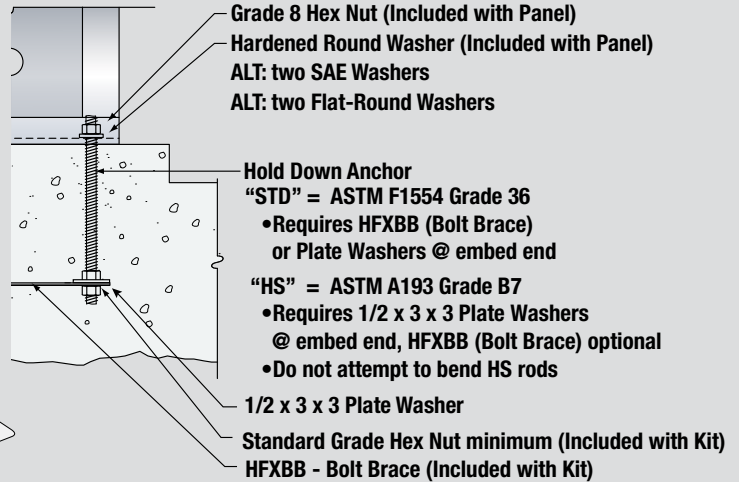
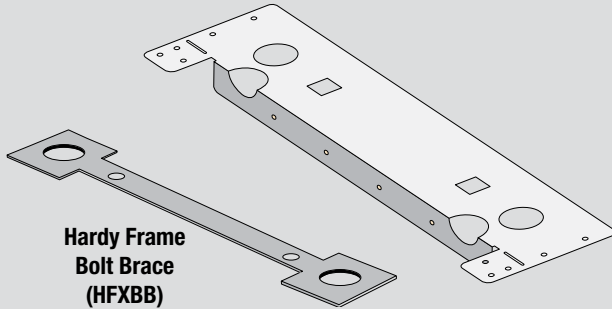
| Hardy Frame® Saddle ^{1,2} | | | |
|------------------------------------|----------------------------------|--|-----------------------------|
| Model Number | Fastener Quantity ^{3,4} | Allowable Tension ^{5,6} (lbs) | Allowable Compression (lbs) |
| HFS24 | 24-16d common | 2950 | 2500 |
| HFS36 | 32-16d common | 4280 | 2500 |

For SI 1 inch = 25.4 mm, 1 lb. = 4.45 N

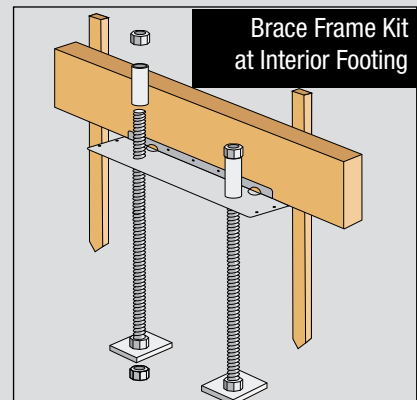
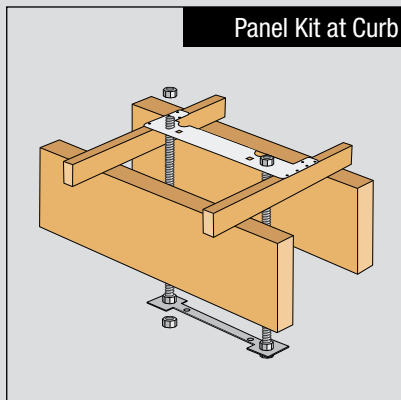
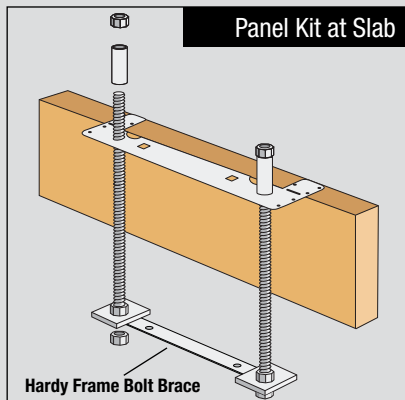
1. Loads shown are Allowable Stress Design (ASD) and exclude a 1.33 stress increase.
2. The maximum notched section in the wood member is 4-1/2 inches.
3. Fastener quantity is the number of 16d Common nails to be installed into each of the members to be joined.
4. When the end distance from the joint to the first nail hole is less than 1-inch, omit the (2) nails in the 3-inch side-plate and the (1) nail in the 1-1/2 inch side-plate that are nearest the joint. For this condition there is no reduction in values.
5. The allowable tension capacities are for normal duration. The values may be adjusted for other durations, such as for seismic and wind loading in accordance with the AF&PA NDS.
6. Allowable tension capacities assume the Saddle is attached to lumber members with a specific gravity of 0.49 or higher

Hardy Frame® HFX Template (HFXT)

- Assures proper bolt spacing and alignment
- 16 gage material supports weight of embed bolts
- Variety of applications
- Also available for 2x6 wall framing



Hardy Frame® HFX Template Kit (HFXTK)



Hardy Frame® HFX Template Kit Components

| Kit Model Number | Template (1 ea) | Bolt Brace (1 ea) | Panels | | Brace Frames | |
|------------------|-----------------|-------------------|---------------------------|----------|--------------|--------|
| | | | Hold Down Anchor Assembly | | | |
| | | | 1-1/8 STD | 1-1/8 HS | 7/8 STD | 7/8 HS |
| HFXTK9 | HFXT9 | HFxBB9 | 2 | | | |
| HFXTK12 | HFXT12 | HFxBB12 | 2 | | | |
| HFXTK-HS12 | | | | 2 | | |
| HFXTK15 | HFXT15 | HFxBB15 | 2 | | | |
| HFXTK-HS15 | | | | 2 | | |
| HFXTK18 | HFXT18 | HFxBB18 | 2 | | | |
| HFXTK-HS18 | | | | 2 | | |
| HFXTK21 | HFXT21 | HFxBB21 | 2 | | | |
| HFXTK-HS21 | | | | 2 | | |
| HFXTK24 | HFXT24 | HFxBB24 | 2 | | | |
| HFXTK-HS24 | | | | 2 | | |
| HFXTK32 | HFXT32 | NA | | | 2 | |
| HFXTK-HS32 | | | | | | 2 |
| HFXTK44 | HFXT44 | | | | 2 | |
| HFXTK-HS44 | | | | | | 2 |

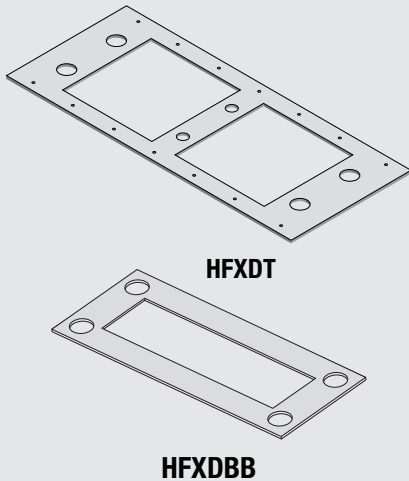
Hold Down Anchor Assemblies:

- 1-1/8 STD = 1-1/8 x 32" ASTM F1554 Grade-36 all thread with (3) Standard Hex Nuts
- 1-1/8 HS = 1-1/8 x 38" ASTM A193 Grade-B7 all thread with (1) 1/2x3x3 ASTM A36 Plate Washer & (3) Standard Hex Nuts
- 7/8 STD = 7/8 x 30" ASTM F1554 Grade-36 all thread with (1) 1/2x3x3 ASTM A36 Plate Washer & (3) Standard Hex Nuts
- 7/8 HS = 7/8 x 31" ASTM A193 Grade-B7 all thread with (1) 1/2x3x3 ASTM A36 Plate Washer & (3) Standard Hex Nuts

For other rod lengths contact Hardy Frames

- 1) All Thread length = length of embed (le) + 12" (formboard) + 6"(Kit assembly + height above concrete) For Raised Floor installations adjust the all thread length or extend length with a Grade 8 Coupling nut
- 2) The Hardened Round Washers for connecting the Panel base may be substituted with two SAE or two Round-Flat Washers
- 3) STD assemblies require a Hardy Frame® Bolt Brace (Minimum) double nipped at the embed end or 1/2x3x3 ASTM A36 Plate Washer
- 4) HS assemblies require 1/2x3x3 ASTM A36 Plate Washer (Minimum) and the Hardy Frame® Bolt Brace is optional
- 5) HS all thread rods provided by Hardy Frame are stamped on both ends



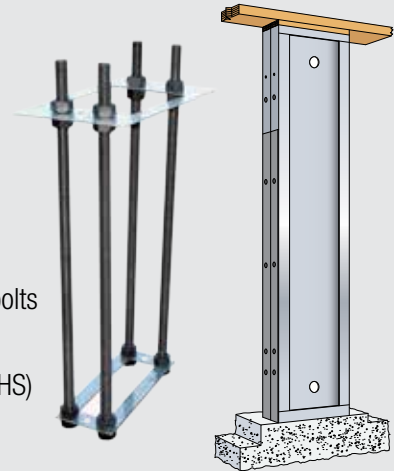


**Back-to-Back Hardy Frame®
HFX Double Template**

- Locates bolts for “Back-to-Back” installation in 8” wall framing
- Large cut-outs allow concrete and mortar placement
- 14 gage material supports weight of embed bolts

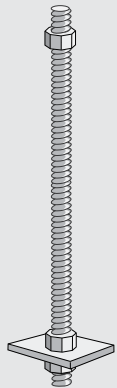
Back to Back Anchorage Components

- 4 ea. HFAB 1-1/8 (specify length and STD or HS)
- 1 ea. HFXDT Template
- 1 ea. HFXDBB Bolt Brace



Anchor Bolt Assemblies

Hardy Frame Anchor Bolt Assemblies (HFAB) are sold individually in lengths of 36", 48", 60" and 72" inches to provide rod lengths for various embed depths. HFABs are available in Standard Grade (STD) or High Strength Grade (HS) to meet plan specifications and in 1-1/8 inch diameters for anchoring Panels, 7/8 inch diameters for anchoring Brace Frames.



**ANCHOR BOLT
ASSEMBLY**

For complete structural components provided in Hardy Frame Template Kits order the following:

Panels

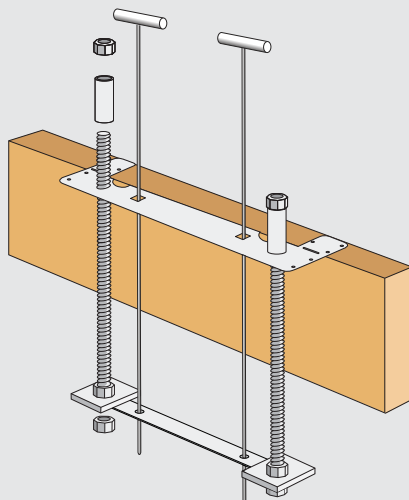
- 2 each HFAB1-1/8 (Specify length and STD or HS grade)
- 1 each HFXT Template
- 1 each HFXBB Bolt Brace

Brace Frames

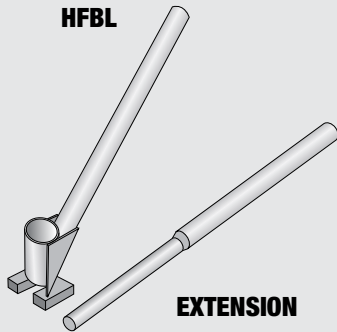
- 2 each HFAB7/8 (Specify length and STD or HS grade)
- 1 each HFXT Template

| Panels | Brace Frames |
|-----------------|---------------|
| HFAB1-1/8x36STD | HFAB7/8x36STD |
| HFAB1-1/8x48STD | HFAB7/8x48STD |
| HFAB1-1/8x60STD | HFAB7/8x60STD |
| HFAB1-1/8x72STD | HFAB7/8x72STD |
| HFAB1-1/8x36HS | HFAB7/8x36HS |
| HFAB1-1/8x48HS | HFAB7/8x48HS |
| HFAB1-1/8x60HS | HFAB7/8x60HS |
| HFAB1-1/8x72HS | HFAB7/8x72HS |

Hardy Frame® T-Rods (HFTR)

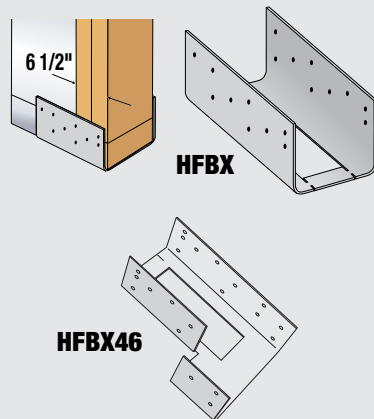


Hardy Frame T-Rods (HFTR) are used in combination with Hardy Frame Templates and Bolt Braces to position the embed end of hold down anchors prior to pouring concrete. T-Rods are 1/2 inch diameter, 5 feet long, pointed on one end with a handle provided on the other end. With the Hardy Frame Template Kit assembled and hung from a form board the installer feeds the pointed end of the HFTR through square holes provided in the Template then through holes provided in the Bolt Brace. When the embed end of the hold down anchor is in the desired location the T-Rod is pushed into the soil at the bottom of the footing to prevent movement during the concrete pour. After the concrete is poured and before it sets remove the T-Rod leaving the anchors positioned perfectly in the footing.



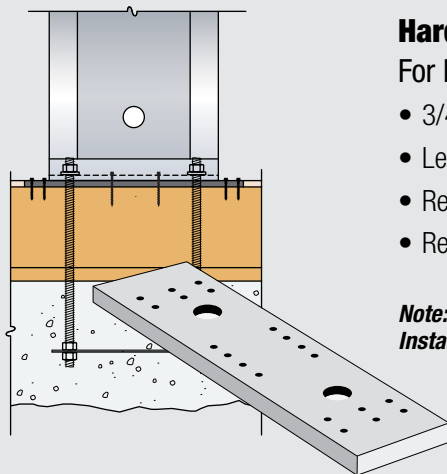
Hardy Frame® Bolt Lever (HFBL)

- Straightens embed bolts while preventing concrete spall
- Place nut on bolt and position inside the HFBL cylinder. With handle oriented in direction to be bent, pull handle downwards
- Unique base plate applies compression to concrete to prevent spall
- Extension handle provides leverage
- *Note: Not recommended for use with high strength rods*



Hardy Frame® Base Extension (HFBX)

- Connects adjacent wood mudsill and stud (or Post) to Hardy Frame Panel/Brace Frame
- Adjustable installation for HFBX extends up to 6 1/2" beyond face of Panel
- "Break-away" tab allows installation after Panel/Frame has been set
- Pre-punched holes for wood nailing
- Can be screwed to Panel/Brace Frame for additional stability

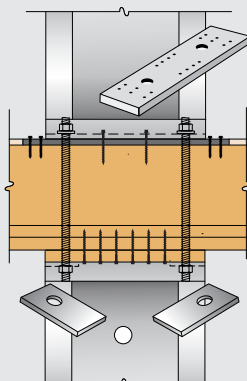


Hardy Frame® Bearing Plate (HFXBP)

For Installation with Hardy Frame® Panels

- 3/4" thick x 3 1/2" wide ASTM A36 steel
- Length extends 3" beyond Panel edges Check for outside corner conditions!
- Reduces wood deformation from overturning forces
- Reduces effects of shrinkage by eliminating bottom plate

Note: The allowable values in raised floor and upper floor tables assume installation of HFXBP. Installation without a HFXBP may result in a reduction of allowable loads

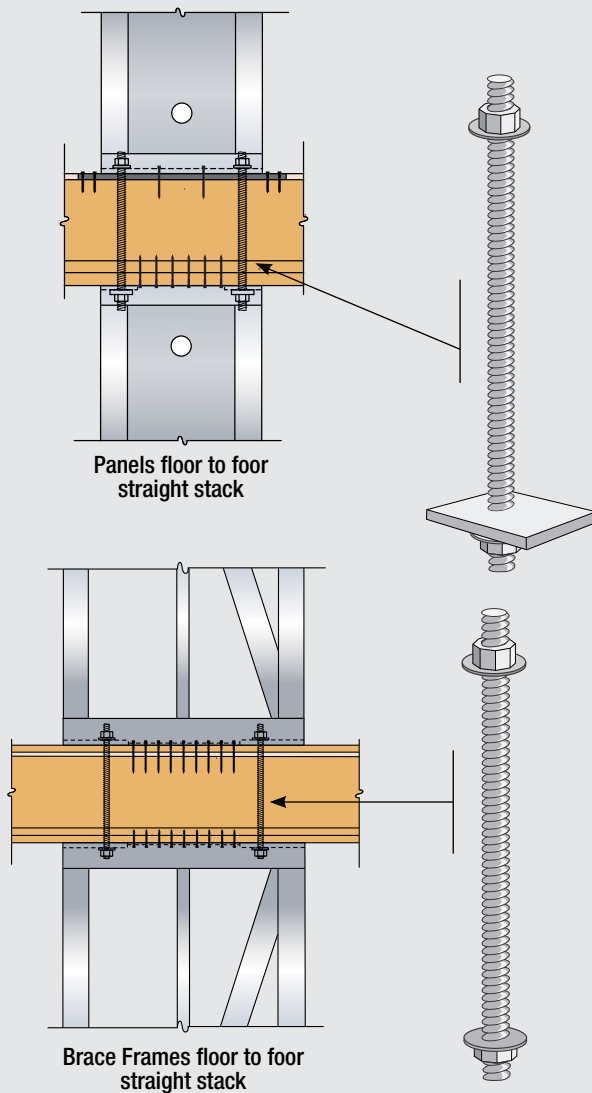


Hardy Frame® Stacking Washer (STK)

- Hardy Frame® Stacking ("STK") washers are required in the top of Panels when connecting to a hold down rod from above.
- Hardy Frame® "STK" Panels, include Stacking Washers pre-welded inside the top channel.
- When Stacking Washers have not been pre-welded, they are available individually or in Tension Connector Kits (HFTC)
- HFSW12 measures 2-3/4" x 3" for installation in HFX-12x Panels
- HFSW15-24 measures 2-3/4" x 5" for installation in HFX-15x through HFX-24x Panels

Hardy Frame® Tension Connectors

*For joist depths up to 14"



- Hardy Frame "STK" washers are required in the top of Panels when connecting to a hold down rod from above.
- Includes all rods, nuts and washers for making floor to floor tension connections
- Provides connection of Panels and Brace Frames straight or "staggered" stack conditions
- For Panels - Indicate Panel width and rod grade
- For Brace Frames - Indicate rod grade

HFTC12 STD

- ROD GRADE
- 12 in. PANEL WIDTH
- HARDY FRAME TENSION CONNECTORS

HFTC15-24 STD

- ROD GRADE
- 15 in. THROUGH 24 in. PANEL WIDTHS
- HARDY FRAME TENSION CONNECTORS

HFTC-7/8 STD

- ROD GRADE
- ROD DIAMETER (FOR BRACE FRAMES)
- HARDY FRAME TENSION CONNECTORS

Hardy Frame® Tension Connector Kit Components

| Tension Kit Model Number | "STK" Stacking Washer | Panels | | Brace Frames | |
|--------------------------|-----------------------|---------------------------|----------|--------------|--------|
| | | Hold Down Anchor Assembly | | | |
| | | 1-1/8 STD | 1-1/8 HS | 7/8 STD | 7/8 HS |
| HFTC12-STD | 2-HFSW12 | 2 | | | |
| HFTC12-HS | 2-HFSW12 | | 2 | | |
| HFTC15-24 STD | 2-HFSW15-24 | 2 | | | |
| HFTC15-24 HS | 2-HFSW15-24 | | 2 | | |
| HFTC-7/8 STD | NA | | | 2 | |
| HFTC-7/8 HS | NA | | | | 2 |

Hold Down Anchor Assemblies:

HFTC-1 1/8 STD = 1-1/8 x 26" ASTM F1554 Grade-36 all thread with (2) Hardened Round Washers & (2) Grade 8 Hex Nuts.

HFTC-1 1/8 HS = 1-1/8 x 26" ASTM A193 Grade-B7 all thread with (2) Hardened Round Washers & (2) Grade 8 Hex Nuts

HFTC-7/8 STD = 7/8 x 26" ASTM F1554 Grade-36 all thread with (2) Hardened Round Washers & (2) Grade 8 Hex Nuts.

HFTC-7/8 HS = 7/8 x 26" ASTM A193 Grade-B7 all thread with (2) Hardened Round Washers & (2) Grade 8 Hex Nuts

1) Hardy Frame® "STK" washers are required in the top channel of Panels when connecting to a hold down rod from above

2) All Thread length fits up to a 14" joist depth + 3/4" subfloor + (4) 2x wood plate

3) Each Hardened Round Washer may be substituted with (2) SAE or (2) Round-Flat Washers

4) HS all thread rods provided by Hardy Frame are stamped on both ends

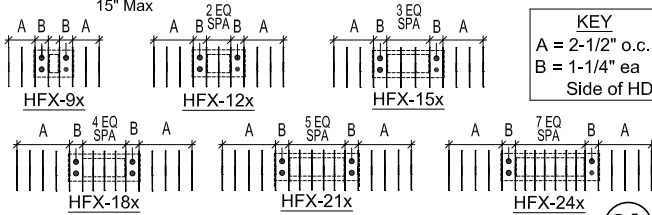
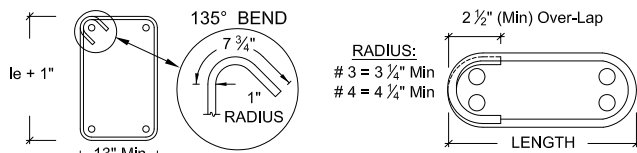
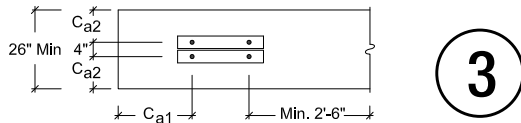
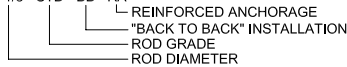


BACK TO BACK REINFORCED ANCHORAGE (BB-RA)

| Model | Panel Width (In) | Anchorage ¹ | Rod Dia (In) | Rod ^{2,3} Grade | BB-RA | | | Stirrups ⁹ (In) | Shear ⁷ Ties |
|---------|------------------|-----------------------------------|--------------|--------------------------|----------------------|----------------------|----------------------|----------------------------|-------------------------|
| | | | | | le ⁴ (In) | Ca ¹ (In) | Ca ² (In) | | |
| HFX-9x | 9 | 1-1/8-STD-BB-RA | 1-1/8 | STD | 13 | 19-3/4 | 11 | 8 - # 4 | # 3 (min) @ 3-3/4" OC |
| HFX-12x | 12 | 1-1/8-STD-BB-RA 1-1/8-HS-BB-RA | | STD HS | 18 | | | 11 - # 4 | # 3 (min) @ 4" OC |
| HFX-15x | 15 | 1-1/8-STD-BB-RA 1-1/8-HS-BB-RA | STD HS | 20 | 20-5/8 | 11 | 12 - # 4 | # 4 (min) @ 4" OC | |
| HFX-18x | 18 | 1-1/8-STD-BB-RA 1-1/8-HS-BB-RA | STD HS | 23 | | | 15 - # 4 | | |
| HFX-21x | 21 | 1-1/8-STD-BB-RA 1-1/8-HS-BB-RA | STD HS | 26 | 16 - # 4 | | | | |
| HFX-24x | 24 | 1-1/8-STD-BB-RA 1-1/8-HS-BB-RA | STD HS | | 18 - # 4 | | | | |

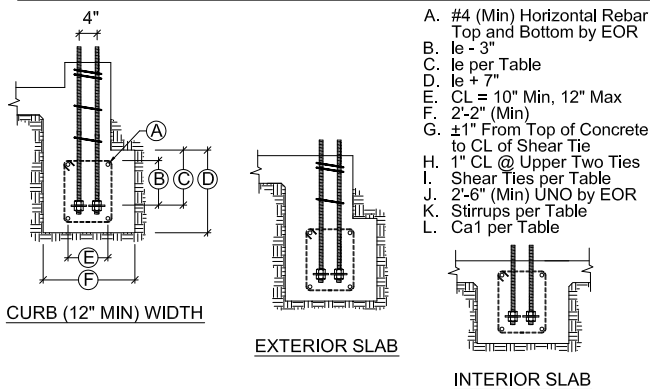
BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE

1-1/8 - STD - BB - RA

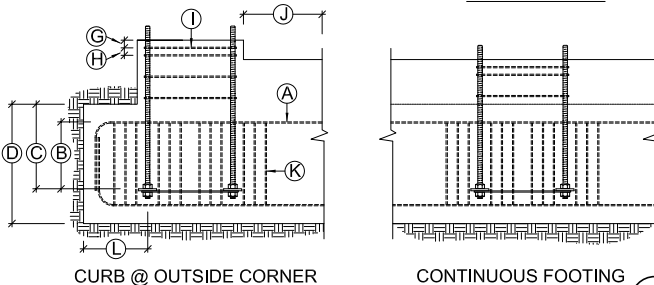


BB-RA SHEAR TIES & STIRRUPS

3A



- A. #4 (Min) Horizontal Rebar Top and Bottom by EOR
- B. le - 3"
- C. le per Table
- D. le + 7"
- E. CL = 10" Min, 12" Max
- F. 2'-2" (Min)
- G. ±1" From Top of Concrete to CL of Shear Tie
- H. 1" CL @ Upper Two Ties
- I. Shear Ties per Table
- J. 2'-6" (Min) UNO by EOR
- K. Stirrups per Table
- L. Ca1 per Table



BB-RA SECTIONS & ELEVATIONS

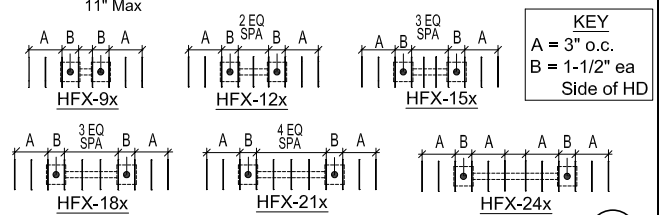
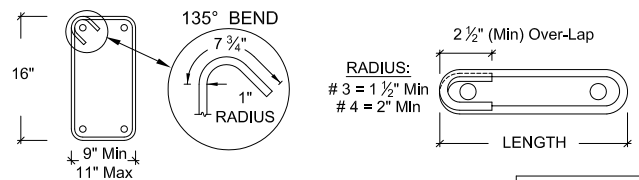
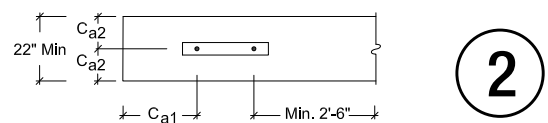
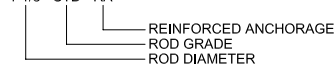
3B

REINFORCED ANCHORAGE (RA)

| Model | Panel Width (In) | Anchorage ¹ | Rod Dia (In) | Rod ^{2,3} Grade | RA | | | Stirrups ⁹ (In) | Shear ⁷ Ties |
|---------|------------------|-----------------------------|--------------|--------------------------|----------------------|----------------------|----------------------|----------------------------|-------------------------|
| | | | | | le ⁴ (In) | Ca ¹ (In) | Ca ² (In) | | |
| HFX-9x | 9 | 1-1/8-STD-RA | 1-1/8 | STD | 19-3/4 | 11 | 8 - # 4 | # 3 (min) @ 3-3/4" OC | |
| HFX-12x | 12 | 1-1/8-STD-RA 1-1/8-HS-RA | | STD HS | | | 9 - # 4 | | |
| HFX-15x | 15 | 1-1/8-STD-RA 1-1/8-HS-RA | STD HS | 15 | 20-5/8 | 11 | 10 - # 4 | # 3 (min) @ 4" OC | |
| HFX-18x | 18 | 1-1/8-STD-RA 1-1/8-HS-RA | STD HS | 15 | | | 11 - # 4 | | |
| HFX-21x | 21 | 1-1/8-STD-RA 1-1/8-HS-RA | STD HS | | | | 12 - # 4 | # 4 (min) @ 4" OC | |
| HFX-24x | 24 | 1-1/8-STD-RA 1-1/8-HS-RA | STD HS | | | | | | |

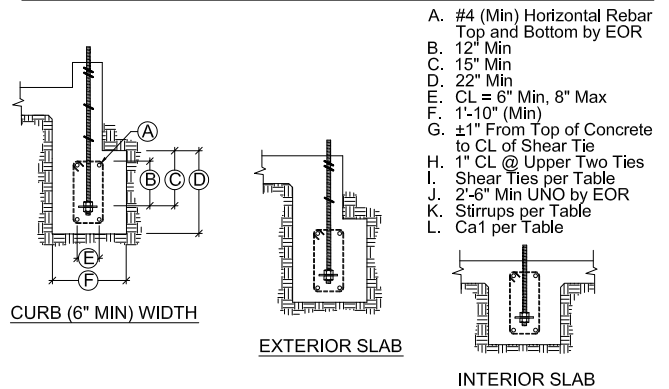
REINFORCED ANCHORAGE NOMENCLATURE

1-1/8 - STD - RA

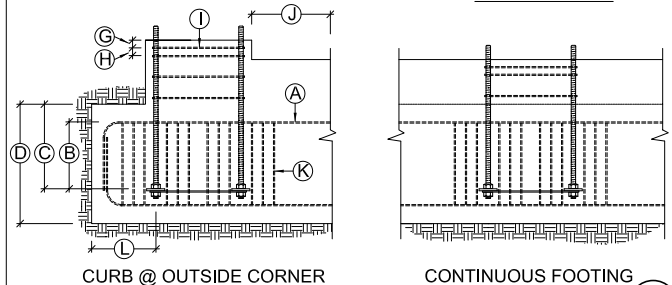


RA SHEAR TIES & STIRRUPS

2A



- A. #4 (Min) Horizontal Rebar Top and Bottom by EOR
- B. 12" Min
- C. 15" Min
- D. 22" Min
- E. CL = 6" Min, 8" Max
- F. 1'-10" (Min)
- G. ±1" From Top of Concrete to CL of Shear Tie
- H. 1" CL @ Upper Two Ties
- I. Shear Ties per Table
- J. 2'-6" Min UNO by EOR
- K. Stirrups per Table
- L. Ca1 per Table



RA SECTIONS & ELEVATIONS

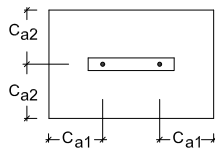
2B

UNREINFORCED ANCHORAGE (UA)

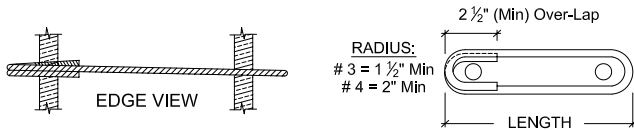
| Model | Panel Height | Anchorage 1 | Rod Dia (in) | Rod 2,3 Grade | UA | | Shear 7,8 Ties |
|----------------------|--------------|-----------------|--------------|---------------|----------------------------------|--|----------------|
| | | | | | l _e ⁴ (in) | Ca1 ⁵ & Ca2 ⁶ (in) | |
| HFX-9x | 79.5" - 8' | 1-1/8-STD-13-19 | 1-1/8 | STD | 13 | 19 | 1 - # 3 |
| HFX-12x | 78" - 10' | 1-1/8-HS-20-30 | | HS | 20 | 30 | |
| HFX-15x, 18x | 78" - 13' | 1-1/8-STD-14-20 | | STD | 14 | 20 | |
| HFX-15x, 18x Balloon | 14' - 20' | 1-1/8-HS-20-30 | | HS | 20 | 30 | 2 - # 3 |
| HFX-21x, 24x | 78" - 13' | 1-1/8-STD-14-20 | | STD | 14 | 20 | |
| HFX-21x, 24x Balloon | 14' - 20' | 1-1/8-HS-23-34 | | HS | 23 | 34 | |

UNREINFORCED ANCHORAGE NOMENCLATURE

1-1/8 - STD - 14 - 20
 END & EDGE DISTANCE (Ca1 & Ca2)
 EMBEDMENT DEPTH (l_e)
 ROD GRADE
 ROD DIAMETER



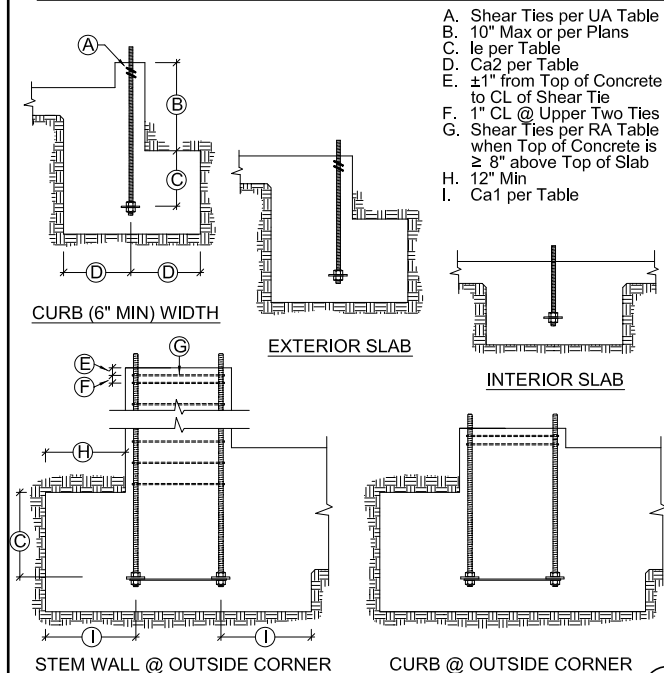
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| SHEAR TIES | | NOT REQUIRED WHEN | |
|------------|---------|----------------------------|-----------------------------|
| Model | Length | End Distance @ T.O. Conc ≥ | Edge Distance @ T.O. Conc ≥ |
| HFX-9x | 7-1/2" | 2-3/8" | 2-3/8" |
| HFX-12x | 10-1/2" | 6-1/4" | 3-1/2" |
| HFX-15x | 12" | 7-3/8" | 4-1/4" |
| HFX-18x | 15" | 8-3/8" | 5" |
| HFX-21x | 18" | 9-3/8" | 5-1/2" |
| HFX-24x | 21" | 10-3/8" | 6" |

UA SHEAR TIES

1A



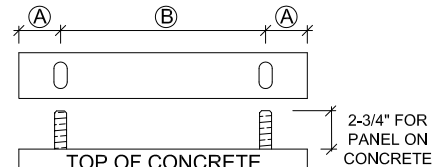
- A. Shear Ties per UA Table
- B. 10" Max or per Plans
- C. l_e per Table
- D. Ca2 per Table
- E. ±1" from Top of Concrete to CL of Shear Tie
- F. 1" CL @ Upper Two Ties
- G. Shear Ties per RA Table when Top of Concrete is ≥ 8" above Top of Slab
- H. 12" Min
- I. Ca1 per Table

UA SECTIONS & ELEVATIONS

1B

TABLE NOTES

- Designs are to resist loading per ACI 318-11 D.3.3.4.3.
- STD indicates Anchors complying with ASTM F1554 Grade 36 with a Hardy Frame Bolt Brace (HFXBB) installed with double nuts on the embed end.
- HS indicates Anchors complying with ASTM A193 Grade B7 with a 1/2"x3"x3"(Min) Plate Washer installed with double nuts on the embed end (HFXBB not required).
- l_e = length of embedment from the top of footing or grade beam to the top of the HFXBB Bolt Brace (top of the embedded Plate Washer @ HS anchors)
- Ca1 = distance from HD Centerline to the end of the footing or grade beam.
- Ca2 = distance from HD Centerline to both the front and the back face of the footing or grade beam.
- Shear Ties are Grade 60 (Min) rebar that are required for near edge distance conditions per ACI-318-11, f_c = 2,500 psi. Curbs and stem walls must be 6 inch (min) width for UA and RA, 12 inch (min) width for BB-RA.
- For UA applications Shear Ties are not required when the installation is away from the edge (see detail 1A), installation on wood framing, or for IRC Braced Wall Panel applications.
- Stirrups are Grade 60 (Min) rebar. See table for size and spacing. See "Stirrup Layout" diagrams and "Key" for layout patterns.
- Concrete Edge Distances must comply with ACI 318-11 D8.2.



| Model | Width | HFX ANCHOR CENTERLINES | |
|---------|-------|------------------------|---------|
| | | (A) | (B) |
| HFX-9x | 9" | 1-3/4" | 5-1/2" |
| HFX-12x | 12" | | 8-1/2" |
| HFX-15x | 15" | 2-5/8" | 9-3/4" |
| HFX-18x | 18" | | 12-3/4" |
| HFX-21x | 21" | | 15-3/4" |
| HFX-24x | 24" | | 18-3/4" |

HFX ANCHOR CENTERLINES

A

IMPORTANT

- ANCHORAGE IS DESIGNED FOR TENSION AND SHEAR TRANSFER ONLY, FOUNDATION DESIGN PER EOR.
- REINFORCEMENT SHOWN IS THE MINIMUM REQUIREMENT AND IS NOT INTENDED TO REPLACE REINFORCEMENT DESIGNED BY THE EOR.
- FOR RA AND BB-RA INSTALLATIONS, THE HFXBB BOLT BRACE MAY BE PLACED ON TOP OF THE STIRRUPS PROVIDED DOUBLE-NUTS ARE INSTALLED AT THE EMBED END OF THE ANCHOR RODS. (NOTE: 1/2" x 3" x 3" PLATE WASHERS ARE REQUIRED TO BE DOUBLE-NUTTED AT EMBED END OF HIGH STRENGTH ANCHOR RODS.)
- HIGH STRENGTH ALL-THREAD RODS PROVIDED BY HARDY FRAMES ARE STAMPED ON BOTH ENDS.

HF B7

IMPORTANT NOTES

B

| REVISIONS | DATE |
|-----------|------|
| | |

Anchorage Details — HFX Panels

THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

HARDY FRAME
SHEAR WALL SYSTEM

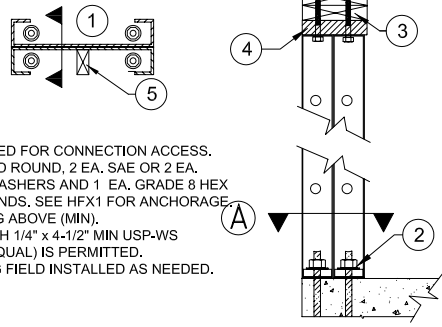
1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com



DATE:
1-1-2016

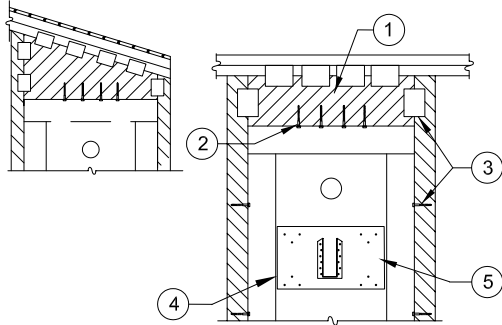
HFX1

SECTION A



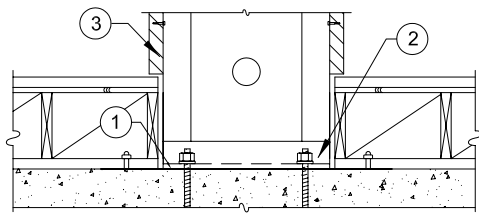
1. CAVITY ORIENTED FOR CONNECTION ACCESS.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS, SEE HFX1 FOR ANCHORAGE.
3. 8 INCH FRAMING ABOVE (MIN).
4. A 2x FILLER WITH 1/4" x 4-1/2" MIN USP-WS SCREWS (OR EQUAL) IS PERMITTED.
5. WOOD BACKING FIELD INSTALLED AS NEEDED.

BACK TO BACK INSTALLATION (11)



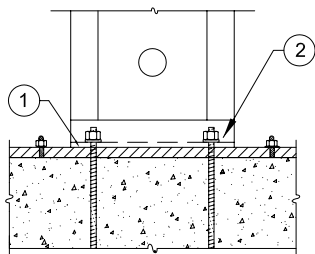
1. 4x WOOD FILLER WITH USP MP4-F CONNECTORS (OR EQUAL) BY BUILDING DESIGN PROFESSIONAL.
2. 1/4" x 3" (MIN) USP "WS-SERIES" SCREWS (OR EQUAL). QUANTITY PER TABLES
3. ADJACENT FRAMING WITH 1/4" DIAMETER SCREWS IS INSTALLED AT THE EDGES WHEN INSTALLING A 4x FILLER ABOVE OR WHEN SPECIFIED BY DESIGN PROFESSIONAL.
4. OPTIONAL LEDGER PRE-DRILL 3/16" DIA. HOLES, EVENLY SPACED IN FACE OF PANEL AND INSTALL 1/4" DIA. WOOD SCREWS INTO 2x (MIN.) WOOD LEDGER LOCATED IN PANEL CAVITY.
5. CONNECTOR AND ATTACHMENT BY BUILDING DESIGN PROFESSIONAL.

TOP CONNECTION W/4x FILLER (10)



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS, SEE HFX1 FOR ANCHORAGE.
3. ADACCENT FRAMING WITH 1/4" DIAMETER SCREWS IS INSTALLED AT THE EDGES WHEN INSTALLING A 4x FILLER ABOVE OR WHEN SPECIFIED BY DESIGN PROFESSIONAL.

RAISED FLOOR HEAD-OUT (9)

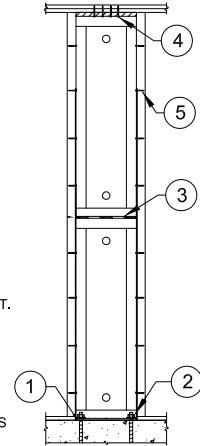


1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.

INSTALLATION ON 2x PLATE (8)

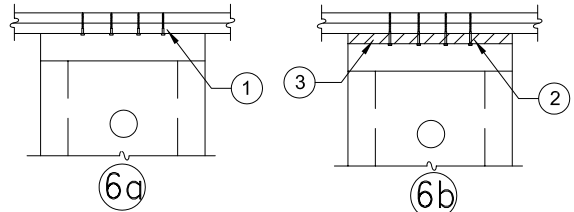
NOTES:

- A) OUT OF PLANE FORCES TO BE RESISTED BY OTHER FRAMING MEMBERS PER THE BUILDING DESIGN PROFESSIONAL.
- B) BALLOON WALL APPLICATIONS REQUIRE HIGH STRENGTH ANCHORAGE. SEE FOUNDATION PLAN AND ANCHORAGE TABLES ON SHEET HFX-1



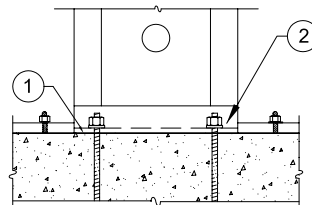
1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.
3. WELDED CONNECTION BY HARDY FRAMES, INC. (NO FIELD CONNECTION REQUIRED).
4. A 2x FILLER WITH 1/4" x 4-1/2" MIN USP-WS SCREWS (OR EQUAL) IS PERMITTED.
5. WHEN REQUIRED BY THE BUILDING DESIGN PROFESSIONAL ATTACH ADJACENT WOOD MEMBERS TO PANEL WITH 1/4" USP-WS SCREWS (OR EQUAL) THROUGH THE PANEL EDGE INTO THE WOOD MEMBER.

BALLOON WALL INSTALLATION (7)



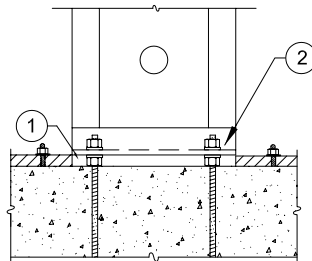
1. 1/4" x 3" (MIN) USP "WS-SERIES" SCREWS (OR EQUAL). QUANTITY PER TABLES
2. 1/4" x 4-1/2" (MIN) USP "WS-SERIES" SCREWS (OR EQUAL). QUANTITY PER TABLES
3. 2x WOOD FILLER.

TOP PLATE CONNECTIONS (6)



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS, SEE HFX1 FOR ANCHORAGE.

INSTALLATION ON FOUNDATION (5)

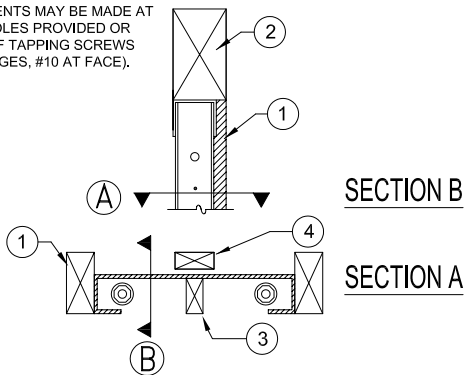


1. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH MIN 5,000 PSI STRENGTH NON-SHRINK GROUT.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.

INSTALLATION ON NUTS & WASHERS (4)

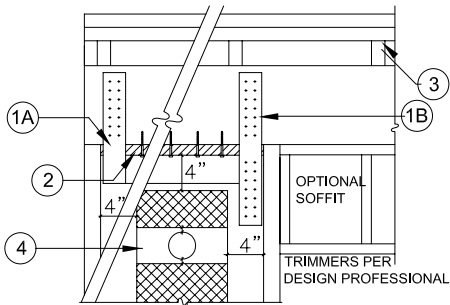
NOTES:

ATTACHMENTS MAY BE MADE AT SCREW HOLES PROVIDED OR WITH SELF TAPPING SCREWS (#12 AT EDGES, #10 AT FACE).



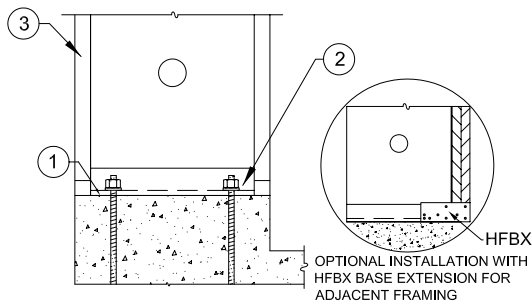
1. TRIMMERS PROVIDE FULL BEARING FOR HEADER ABOVE, DESIGN AND CONNECTIONS BY OTHERS.
2. 6x HEADER.
3. WOOD MEMBERS MAY BE INSERTED VERTICALLY OR HORIZONTALLY IN CAVITY FOR BACKING AS NEEDED.

6x HEADER ABOVE-SECTION 3



- 1A. WELDED STRAPS ARE AVAILABLE FROM MANUFACTURER WHEN REQUIRED BY THE DESIGN PROFESSIONAL.
- 1B. WHEN STRAPS ARE FIELD INSTALLED THE DESIGN AND CONNECTION IS BY THE DESIGN PROFESSIONAL. CONNECTION TO PANEL WITH SELF TAPPING SCREWS IS PERMITTED.
2. A 2x WOOD FILLER WITH 1/4"x4-1/2" (MIN.) USP "WS" SERIES SCREWS OR EQUAL IS PERMITTED.
3. WHEN CRIPPLE STUDS OCCUR, SHEAR TRANSFER DESIGN TO BE PER THE DESIGN PROFESSIONAL.
- 4A. THERE IS NO "INSIDE" OR "OUTSIDE" FACE OF PANEL. TO PREVENT THE NEED FOR ADDITIONAL HOLES ORIENT THE PANEL CAVITY TOWARD THE FIXTURE BEING INSTALLED.
- 4B. A 1" DIA. HOLE MAY BE ADDED IN THE PANEL FACE WHEN IT IS LOCATED IN THE UPPER HALF OF THE PANEL HEIGHT AND IS 4" MIN. FROM ANY EDGE. FOR PANELS MORE THAN 12" WIDE, ADDITIONAL HOLES MUST ALSO BE 1" MINIMUM ABOVE AND BELOW THE 3" DIA. HOLE PROVIDED.
- 4C. FOR HOLES LARGER THAN 1" DIA. OR TO ADD MORE THAN ONE HOLE CONTACT HARDY FRAMES, INC.

TOP CONNECTION TO HEADER 2



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.
3. ADJACENT FRAMING OPTIONAL U.N.O. BY BUILDING DESIGN PROFESSIONAL.

INSTALLATION ON CURB 1

HFX-SERIES 78 IN. THRU 13 FEET

| Model Number | Net Height (in) | Depth (in) | Hold Down Diameter ¹ (in) | Top Screw Qty ² (ea) | Screw Qty Available at Edges (ea) ³ |
|-------------------------|-----------------|------------|--------------------------------------|---------------------------------|--|
| HFX-12,15,18,21 & 24x78 | 78 | 3-1/2 | 1-1/8 | 9" Width = 5 | 4 |
| HFX-9x79.5 | 79-1/2 | | | 12" Width = 6 | |
| HFX-12,15,18,21 & 24x8 | 92-1/4 | | | 15" Width = 8 | |
| HFX-9x8 | 93-3/4 | | | 18" Width = 10 | |
| HFX-12,15,18,21 & 24x9 | 104-1/4 | | | 21" Width = 12 | 5 |
| HFX-12,15,18,21 & 24x10 | 116-1/4 | | | 24" Width = 14 | |
| HFX-15,18,21 & 24x11 | 128-1/4 | | | 6 | |
| HFX-15,18,21 & 24x12 | 140-1/4 | | | | |
| HFX-15,18,21 & 24x13 | 152-1/4 | | | | |

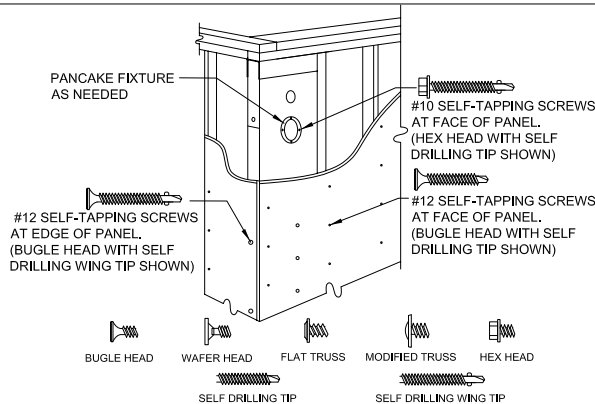
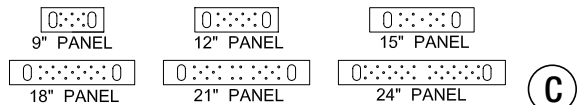
BALLOON PANELS 14 FEET THRU 20 FEET

| Model Number | Net Height (in) | Depth (in) | Hold Down Diameter ¹ (in) | Top Screw Qty ² (ea) | Screw Qty Available at Edges (ea) ³ |
|----------------------|-----------------|------------|--------------------------------------|---------------------------------|--|
| HFX-15,18,21 & 24x14 | 164-1/4 | 3-1/2 | 1-1/8 | 15" Width = 8 | 6 |
| HFX-15,18,21 & 24x15 | 176-1/4 | | | 18" Width = 10 | |
| HFX-15,18,21 & 24x16 | 188-1/4 | | | 21" Width = 12 | 7 |
| HFX-15,18,21 & 24x17 | 200-1/4 | | | 24" Width = 14 | |
| HFX-15,18,21 & 24x18 | 212-1/4 | | | 8 | |
| HFX-15,18,21 & 24x19 | 224-1/4 | | | | |
| HFX-15,18,21 & 24x20 | 236-1/4 | | | | |

- 1) Hold down bolts connect to the Panel base with (1 ea) Hardened Round, (2 ea) Round-Flat or (2 ea) SAE Washers below (1 ea) Grade 8 Hex Nut on each rod or as specified by the Building Design Professional.
- 2) 1/4" diameter USP-WS Series screws (or equal). Length is 3" (minimum) when attached directly to the collector and 4-1/2" (minimum) when installing a 2x filler above the Panel.
- 3) Adjacent framing with 1/4" diameter screws is required at the edges when installing a 4X filler above or when specified by the Design Professional.

INSTALLATION INSTRUCTIONS

- A) When installing directly on concrete, place Panel over bolts and connect with (1 ea) Hardened Round, (2 ea) Round-Flat or (2 ea) SAE Washers below (1 ea) Grade 8 or 2H Heavy Hex Nut. Secure with a deep socket (recommended) until "Snug Tight".
- B) If bottom connection is not detailed on plans, confirm with Design Professional before installing on Nuts & Washers or on a Mud sill.
- C) Use 1/4"x4-1/2" USP-WS Series screws (or equal) at top connections with a 2x filler. If the top of Panel is in direct contact with the collector above (top plates, header, beam, etc.) use 1/4 x 3" (minimum)
- D) For installations with a 4x filler above 1/4" diameter screws are required at the Panel edges to brace for the out-of-plane hinge or when they are specified by the Design Professional.



NOTES:

- 1) SURFACE FINISHES, CONNECTORS AND FIXTURES ARE ATTACHED TO THE PANEL FACE WITH # 10 SELF-TAPPING SCREWS SPACED NO LESS THAN 2-1/4" OC.
- 2) ATTACHMENTS TO THE PANEL EDGES ARE MADE WITH # 12 SELF-TAPPING SCREWS.
- 3) STRUCTURAL CONNECTIONS ARE TO BE DESIGNED BY THE DESIGN PROFESSIONAL.
- 4) STRUCTURAL HARDWARE USED TO TRANSFER LOADS SHOULD NOT EXCEED 12 GAGE.

| REVISIONS | DATE |
|-----------|------|
| | |

Framing Details — HFX Panels

THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

HARDY FRAME
SHEAR WALL SYSTEM

1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com

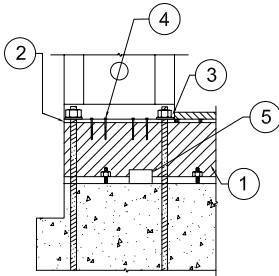
HFX
SERIES

DATE:
1-1-2016

HFX2

NOTE:
INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) RESULTS IN A DECREASE OF ALLOWABLE SHEAR VALUE. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS

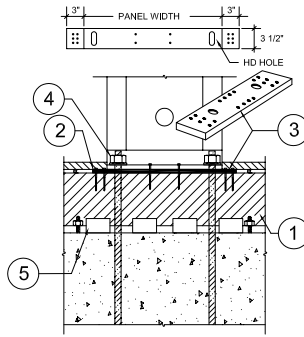
NOTE:
COUPLING NUTS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HF1 FOR ANCHORAGE.
- 1/4" x 4 1/2" (MIN) USP-WS SCREWS (OR EQUAL) THROUGH BOTTOM OF PANEL. MIN QUANTITY PER TABLE.
- USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

RAISED-OS CORNER 4

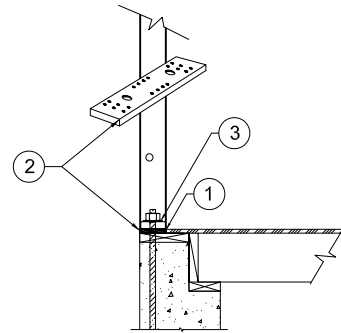
NOTE: COUPLING NUTS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HF1 FOR ANCHORAGE.
- USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

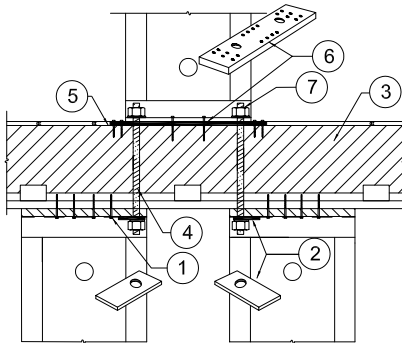
RAISED BEARING PL 3

NOTE:
INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) MAY INCREASE DEFLECTION AND RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUE. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS



- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HF1 FOR ANCHORAGE.

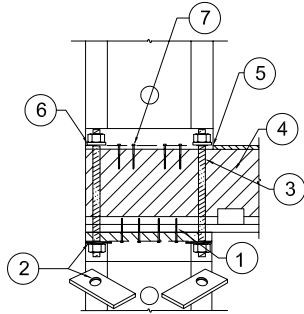
RAISED STEM WALL 2



- 1/4" x 4 1/2" (MIN) USP-WS SCREWS (OR EQUAL) PER TABLE.
- HARDY FRAME** "STK WASHER" AT TOP OF PANEL WHEN CONNECTING TO HOLD DOWN ABOVE.
- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- ALL THREAD ROD PER PLANS.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE.
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.

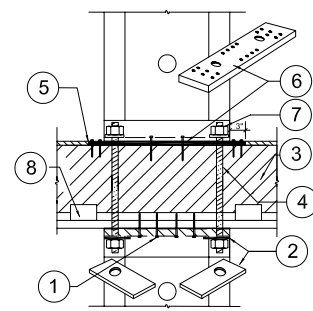
PYRAMID STACK 8

NOTE
INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) MAY INCREASE DEFLECTION AND RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUE. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.



- 1/4" x 4-1/2" (MIN) USP-WS SCREWS (OR EQUAL) PER TABLE.
- HARDY FRAME** "STK WASHER" AT TOP OF PANEL WHEN CONNECTING TO HOLD DOWN ABOVE.
- ALL THREAD ROD PER PLANS.
- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- FLOOR SHEATHING NOTCHED INSTALL PANEL DIRECTLY ON RIM.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.
- 1/4" x 1/2" (MIN) USP-WS SCREWS (OR EQUAL) THROUGH BOTTOM OF PANEL. MIN QUANTITY PER TABLE.

STACK @ OS CORNER 7

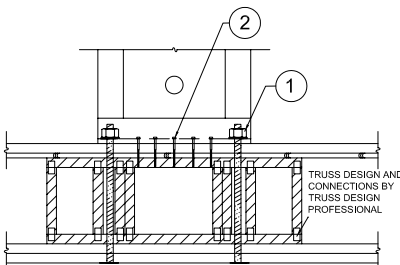


- 1/4" x 4-1/2" (MIN) USP-WS SCREWS (OR EQUAL) PER TABLE.
- HARDY FRAME** "STK WASHER" AT TOP OF PANEL WHEN CONNECTING TO HOLD DOWN ABOVE.
- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- ALL THREAD ROD PER PLANS.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT.
- USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

STRAIGHT STACK 6

NOTE:

- INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) INCREASES DEFLECTION AND MAY RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUES BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.
- TRUSS DESIGN PROFESSIONAL TO CHECK LATERAL SHEAR AND OVERTURNING MOMENT OF TRUSS SYSTEM.
- END BLOCK CONFIGURATION MAY CHANGE TO ACCOMMODATE SPECIFIC JOB CONDITIONS.

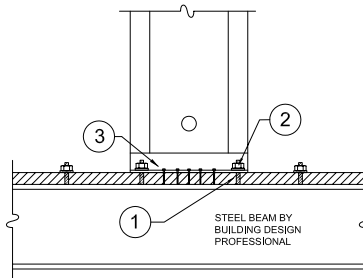


- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.
- 1/4" MIN USP-WS SCREWS (OR EQUAL) WITH FULL PENETRATION INTO TOP CHORD OF BLOCK.

OPEN WEB TRUSS 14

BUILDING DESIGN PROFESSIONAL TO DESIGN

- LOAD PATH FROM BEAM TO FOUNDATION.
- INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) INCREASES PANEL DEFLECTION AND MAY RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUES. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.
- BEAM DEFLECTION MAY INCREASE TOTAL DRIFT OF PANEL. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.

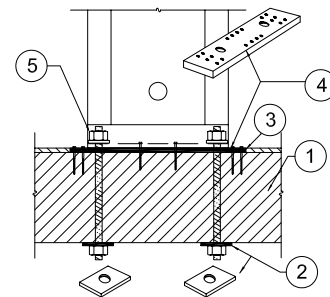


- HOLD DOWN ALL THREAD RODS WELDED TO STEEL BEAM BY BUILDING DESIGN PROFESSIONAL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT.
- 1/4" MIN USP-WS SCREWS (OR EQUAL) MAY BE INSTALLED FOR ADDITIONAL SHEAR TRANSFER.

STEEL BM-WELDED HD 13

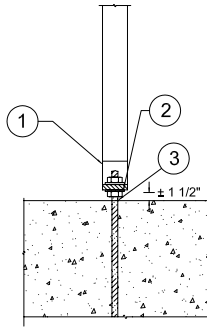
BUILDING DESIGN PROFESSIONAL TO DESIGN

- LOAD PATH FROM BEAM TO FOUNDATION.
- INSTALLATION WITHOUT **HARDY FRAME** BEARING PLATE (HFXPB) INCREASES PANEL DEFLECTION AND MAY RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUES. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.
- BEAM DEFLECTION MAY INCREASE TOTAL DRIFT OF PANEL. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.



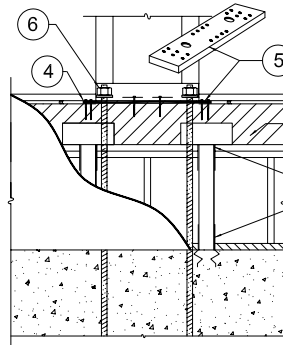
- WOOD BEAM PER PLAN.
- ALL THREAD HOLD DOWN WITH PLATE WASHER AS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL AT UNDERSIDE OF BEAM PER PLAN.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE.
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT.

WOOD BM THRU BOLT 12



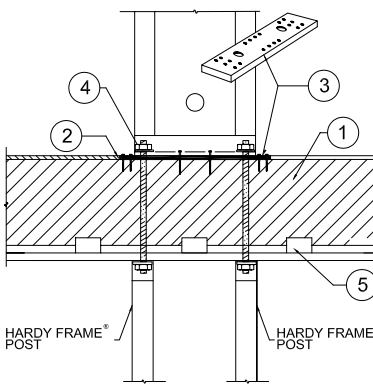
1. ACCESS HOLE LOCATED AT EDGE OF POST.
2. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.
3. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH MINIMUM 5,000 PSI STRENGTH NON-SHRINK GROUT.

POST ON DBL. NUT 1



- 1) USP POST BASE BY THE DESIGN PROFESSIONAL
- 2) USP POST CAP BY THE DESIGN PROFESSIONAL
- 3) 4x (MIN) RIM AND STRUCTURAL FRAMING BY THE DESIGN PROFESSIONAL
- 4) FLOOR SHEATHING NOTCHED FOR BEARING PLATE.
- 5) **HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 6) 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT. SEE HFX1 FOR ANCHORAGE.

CRIPPLE WALL 5



1. 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
2. FLOOR SHEATHING NOTCHED FOR BEARING PLATE.
3. **HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
4. 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.
5. USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

POST BELOW 11

| Model Number | Net Height (in) | Depth (in) | Hold Down Diameter ¹ (in) | Screw Quantity | | | Screw Qty ⁴ Available at Edges (ea) |
|----------------------------|-----------------|------------|--------------------------------------|----------------|-----------------------|-----------------------|--|
| | | | | Panel | Top ² (ea) | Bot ³ (ea) | |
| HFX-12, 15, 18, 21 & 24x8 | 92-1/4 | 3-1/2 | 1-1/8 | 12" Width | 6 | 6 | 4 |
| HFX-12, 15, 18, 21 & 24x9 | 104-1/4 | | | 15" Width | 8 | 8 | |
| HFX-12, 15, 18, 21 & 24x10 | 116-1/4 | | | 18" Width | 10 | 10 | |
| HFX-15, 18, 21 & 24x11 | 128-1/4 | | | 21" Width | 12 | 12 | 5 |
| HFX-15, 18, 21 & 24x12 | 140-1/4 | | | 24" Width | 14 | 14 | |
| HFX-15, 18, 21 & 24x13 | 152-1/4 | | | | | | |

NOTE: **HARDY FRAME** "STK" WASHERS ARE REQUIRED IN THE TOP OF PANELS WHEN CONNECTING TO A HOLD DOWN ROD FROM ABOVE. **HARDY FRAME** "STK PANELS" INCLUDE STK WASHERS PRE-WELDED IN THE TOP CHANNEL.

- 1) Hold down bolts specified as Standard Grade (STD) must comply with ASTM F1554 Grade 36 (or equal) Hold down bolts specified as High Strength (HS) must comply with ASTM A 193 Grade B7 (or equal). HD bolts (both grades) connect to the base of the Panel above with one Hardened Round, two Flat or two SAE Washers and a Grade 8 Hex Nut (or equal). HD bolts (both grades) connect to the top channel of the Panel below with a **Hardy Frame** Stacking (STK) Washer (may be pre-welded in a **Hardy Frame** "STK" Panel), one Hardened Round, two Flat or two SAE Washers and a Grade 8 Hex Nut (or equal).
- 2) 1/4" diameter USP-WS Series screws (or equal). Length is 3" (minimum) when attaching directly to the collector and 4-1/2" (minimum) when installing a 2x filler above the Panel.
- 3) 1/4" diameter USP-WS Series screws (or equal). Length is 4-1/2" (minimum) through base of Panel and 3" (minimum) at **Hardy Frame** Bearing Plate (HFXPB).
- 4) 1/4" diameter screws are required at the edges when installing a 4x filler above or when specified by the Design Professional.

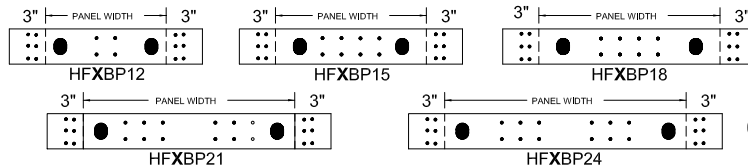
A

INSTALLATION ON FLOOR SYSTEMS WITH **HARDY FRAME BEARING PLATE (HFXPB)**

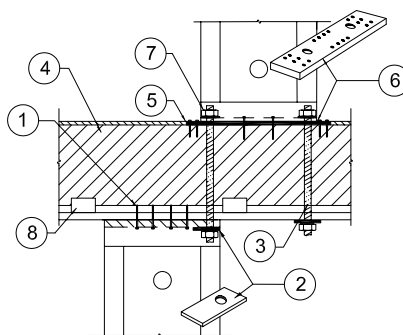
- Install a solid 4x (min) rim in floor system below Panel. Table values assume Engineered Wood Product (EWP).
- Notch floor sheathing and screw ends of HFXPB to rim with 1/4"x3" (min) USP "WS" Series Screws (or equal).
- Install Panel on HFXPB, connect with threaded rod grade specified on plans and secure base of Panel with Hardened Round Washer and Grade 8 Nut (or equal). Nuts to be snug tight.
- When stacking to a Panel below, "STK" Panels include "STK Washers" pre-welded in the top channel, or field install "STK" Washer, Hardened Round Washer and a Grade 8 Nut in the top channel of the Panel below.
- When more than 12 screws are required for minimum bottom screw quantity, install 1/4"x4-1/2" Screws through Panel base and HFXPB into rim.
- For standard wall heights, install a 2x filler above Panel (Dtl 6/HFX2). For larger fillers see Dtl 10/HFX2.

NOTE: Installations may vary with specific job conditions and/or specifications by the Design Professional.

B

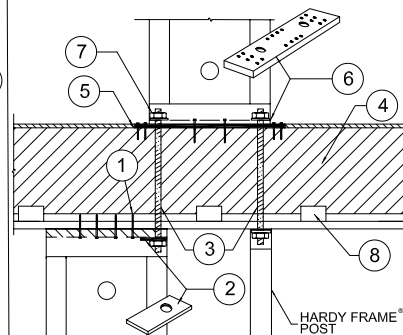


C



- 1/4" x 4-1/2" (MIN) USP-WS SCREWS (OR EQUAL) PER TABLE.
- HARDY FRAME** "STK" WASHER" AT TOP OF PANEL WHEN CONNECTING TO HOLD DOWN ABOVE.
- ALL THREAD ROD HOLD DOWN WITH PLATE WASHER AS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL AT UNDERSIDE OF BEAM PER PLANS.
- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.
- USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

STAGGERED-THRU BOLT 10



- 1/4" x 4-1/2" (MIN) USP-WS SCREWS (OR EQUAL) PER TABLE.
- HARDY FRAME** "STK" WASHER" AT TOP OF PANEL WHEN CONNECTING TO HOLD DOWN ABOVE.
- ALL THREAD ROD PER PLANS.
- 4x (MIN) RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT.
- FLOOR SHEATHING NOTCHED FOR BEARING PLATE (HFXPB).
- HARDY FRAME** BEARING PLATE (HFXPB) WITH 6 EA. 1/4" DIA. x 3" (MIN) USP-WS SCREWS (OR EQUAL) AT EACH END. WHEN MORE THAN 12 EA. SCREWS ARE REQUIRED INSTALL 1/4" x 4-1/2" (MIN) SCREWS THROUGH BASE OF PANEL.
- 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT AT BOTH ENDS.
- USP MP4 F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL.

STAGGERED TO POST 9

| REVISIONS | DATE |
|-----------|------|
| | |

Floor System Details — HFX Panels

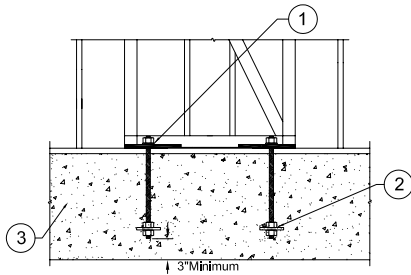
THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

HARDY FRAME
SHEAR WALL SYSTEM
1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com



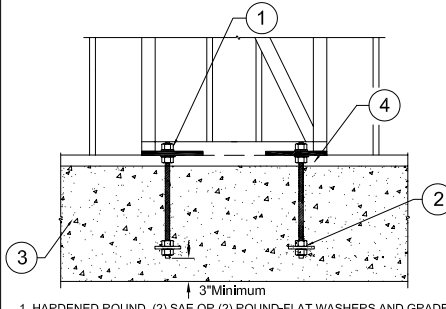
DATE:
1-1-2016

HFX3



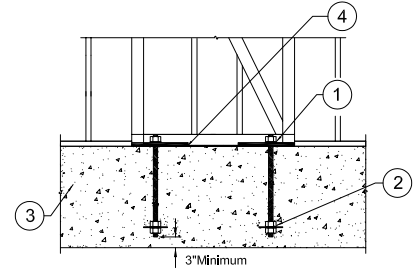
1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & 2 NUTS AT EMBED END PER PLAN
3. FOUNDATION DESIGN BY BUILDING DESIGN PROFESSIONAL

INSTALL ON 2x PLATE (3)



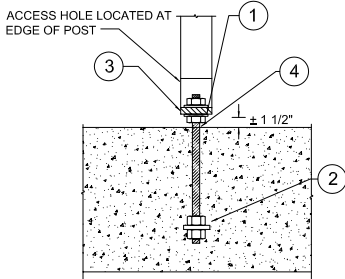
1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS ABOVE AND BELOW BASE
2. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & 2 NUTS AT EMBED END PER PLAN
3. FOUNDATION DESIGN BY BUILDING DESIGN PROFESSIONAL
4. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH MINIMUM 5,000 PSI STRENGTH NON-SHRINK GROUT

INSTALL ON NUT & WASHER (2)



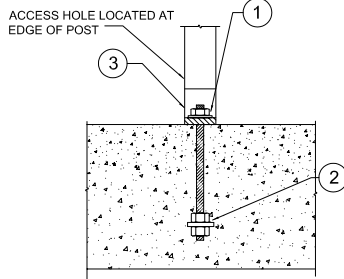
1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & 2 NUTS AT EMBED END PER PLAN
3. FOUNDATION DESIGN BY BUILDING DESIGN PROFESSIONAL
4. MOISTURE BARRIER RECOMMENDED (USE 15# FELT, OR EQ.)

INSTALL ON FOUNDATION (1)



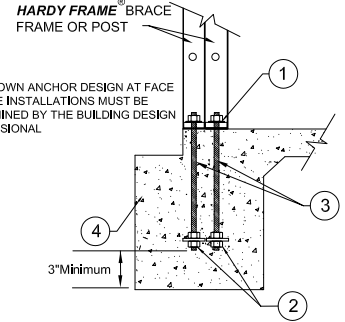
1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS ABOVE AND BELOW BASE
2. THREADED ROD HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & NUT, Hardy Frame BOLT BRACE (HFBB) MAY REPLACE PLATE WASHERS WHEN ASTM F1554 GR36 THREADED ROD IS SPECIFIED
3. 3/4" THICK PLATE WASHER BUILT IN POST BY MANUFACTURER
4. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH MINIMUM 5,000 PSI STRENGTH NON-SHRINK GROUT

POST ON DBL. NUT (6)



1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. THREADED ROD HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & NUT, Hardy Frame BOLT BRACE (HFBB) MAY REPLACE PLATE WASHERS WHEN ASTM F1554 GR36 THREADED ROD IS SPECIFIED
3. 3/4" THICK PLATE WASHER BUILT IN POST BY MANUFACTURER

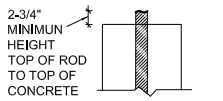
POST ON CONCRETE (5)



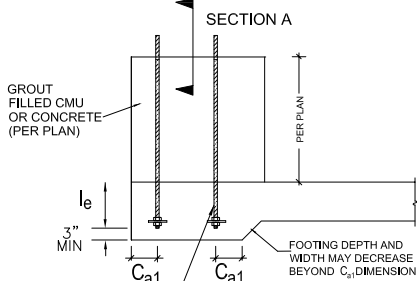
NOTE:
HOLD DOWN ANCHOR DESIGN AT FACE TO FACE INSTALLATIONS MUST BE DETERMINED BY THE BUILDING DESIGN PROFESSIONAL

1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & 2 NUTS AT EMBED END PER PLAN
3. HOLD DOWN BOLTS PER PLAN
4. FOUNDATION DESIGN BY BUILDING DESIGN PROFESSIONAL

BACK TO BACK INSTALLATION (4)



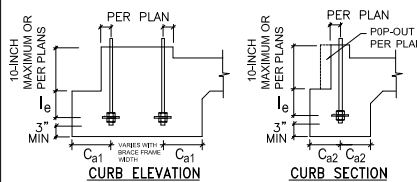
STEM WALL SECTION A



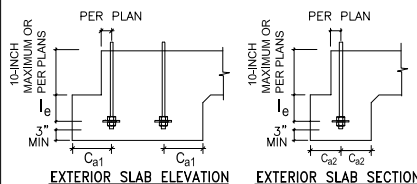
THREADED ROD HOLD DOWN BOLT WITH 1/2"x3"x3" PLATE WASHER & NUT.

NOTE: COUPLING NUTS MAY BE USED TO EXTEND THREADED ROD LENGTH THROUGH STEM WALL

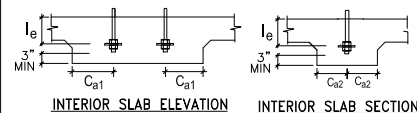
ANCHORAGE AT STEM WALL (9)



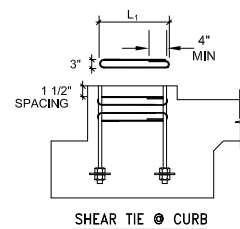
2012 IBC HOLD DOWN ANCHORAGE (8A)



2012 IBC HOLD DOWN ANCHORAGE (8B)

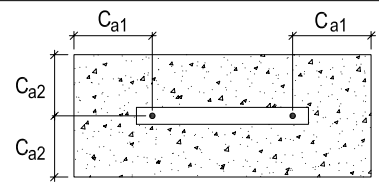


2012 IBC HOLD DOWN ANCHORAGE (8C)



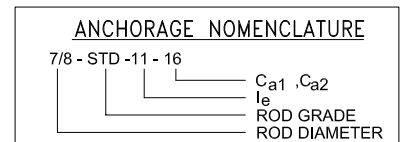
SHEAR TIE @ CURB

(7A)



ANCHORAGE - PLAN VIEW

(7B)



l_e = LENGTH OF EMBED
C_{a1} , C_{a2} = END DISTANCE, EDGE

(7C)

Hardy Frame Installation

Step 1: Concrete Preparation

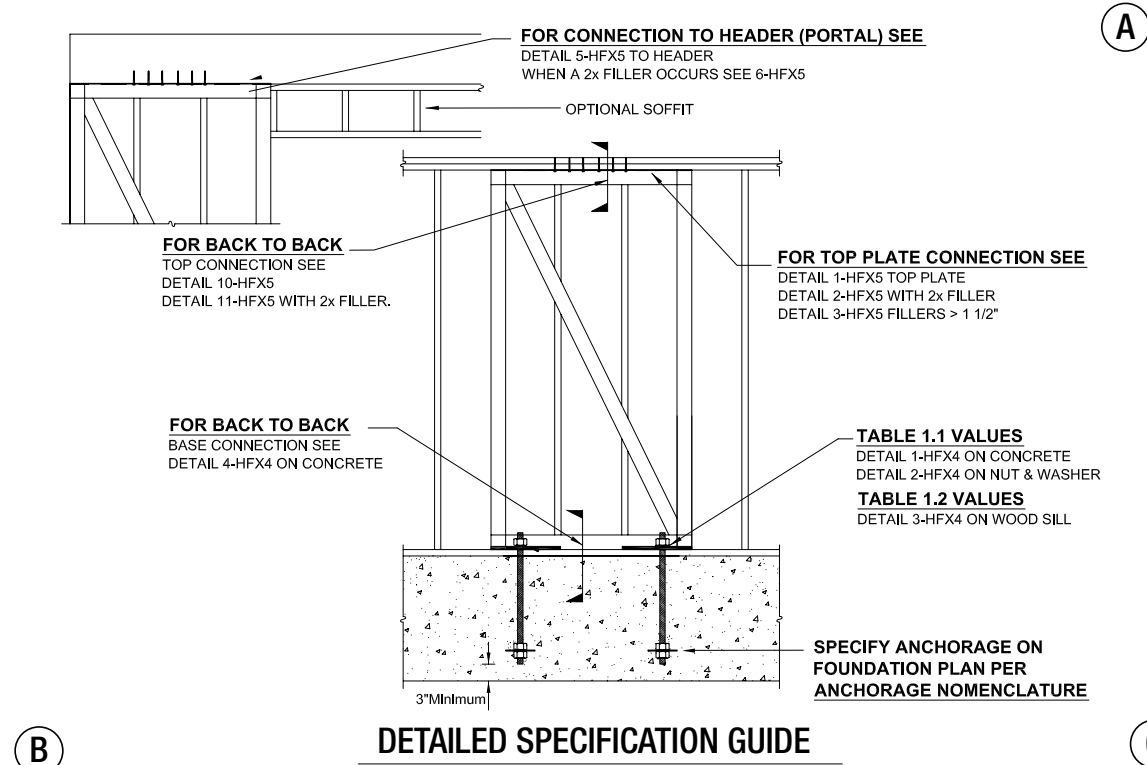
- A) Concrete contractor shall use **Hardy Frame** HFX-Series Templates to accurately place embed bolts for spacing and alignment in the wall.
- B) Attach the HFX-Series Template to a formboard at the location specified on plans and install bolts. Install 1/2"x3"x3" plate washers with nuts above and below at hold downs.
- C) At Interior footings Templates may be secured in place using stakes.
- D) Footing design, embed depths, and anchor edge/end distances are per the Building Design Professional.
- E) Determine if the Hardy Frame will be installed on concrete or a mudsill. For installation directly on concrete the recommended bolt height above finished concrete is 2-3/4" and for installation on a 2x mudsill it is 4-1/4".

Step 2: First Floor Installation on concrete

- A) Installation of a moisture barrier such as Moistop or 15# felt is recommended under the Frame.
- B) Set the **Hardy Frame** over the embed bolts and install (1) Hardened Round, (2) Round-Flat, or (2) SAE washers and a Grade 8 hex nut.
- C) Tighten nuts until snug tight.
- D) After framing and plumb & line are complete, place a 2x filler above the Frame to make up the height difference created by eliminating the sill plate, and connect with 1/4" x 4-1/2" screws through the top of the Frame, through the filler and into the double top plates or header above. For fillers larger than 1-1/2" net, refer to detail 3/HFX5.

Step 2: First Floor Installation on a Sill Plate

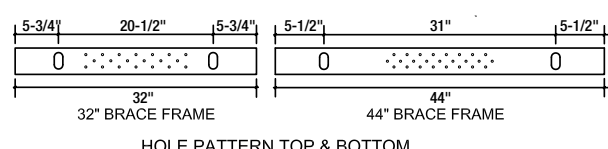
- A) If the **Hardy Frame** is to be installed on a mudsill, plot the bottom plate and cut the length to match the width of the Frame. If located next to a door opening, allow the plate to run into the opening.
- B) Set the **Hardy Frame** over the embed bolts and install (1) Hardened Round, (2) Round-Flat, or (2) SAE washers and a Grade 8 hex nut.
- C) Tighten nuts until snug tight.
- D) After framing and plumb & line are complete, install 1/4"x3" screws through the top of the Frame into the double top plates or header above. Top plates must be continuous or have a minimum 8' lap at splices.



(B)

(C)

DETAILED SPECIFICATION GUIDE



HARDY FRAME® HFX-SERIES BRACE FRAME

| Product Width (in) | Max. Height (ft) | Anchorage (See Nomenclature for Description) | | Shear Tie | | Length L ₁ (in) |
|--------------------|------------------|--|----------------|-----------|----|----------------------------|
| | | STD | HS | Quantity | HS | |
| HFX-32x | 13 | 7/8 STD 10 - 14 | 7/8 HS 15 - 22 | 1 | 1 | 22 1/2 |
| HFX-44x | 13 | | | | 2 | 33 |

HOLE PATTERN TOP & BOTTOM

- 1) Applies to 2500 psi compressive strength concrete, both seismic and wind loading.
- 2) STD indicates rods complying with ASTM F1554 Grade 36 with a 1/2x3x3 plate washer double nutted on the embed end.
- 3) HS indicates rods complying with ASTM A 193 Grade B7 (or equal) with a 1/2x3x3 plate washer double nutted on the embed end.
- 4) Concrete edge distance must comply with ACI-318-08 D8.2.
- 5) Installation on curbs or stemwalls must be 6 inch width minimum, and require supplemental shear reinforcement per ACI-318-08, f_c = 2500 psi.
- 6) Shear Ties #3 rebar, grade 60 (min).
- 7) Shear Ties are not required for installations away from Foundation Edge, for installation on wood framing or for Braced Wall Panel applications.
- 8) Foundation Design is by others.
- 9) The Building Design Professional is permitted to modify these details to accommodate a specific condition.

2012 IBC HOLD DOWN ANCHORAGE TABLE

(D)

| REVISIONS | DATE |
|-----------|------|
| | |
| | |
| | |

Foundation Details — HFX Brace Frames

THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

HARDY FRAME®

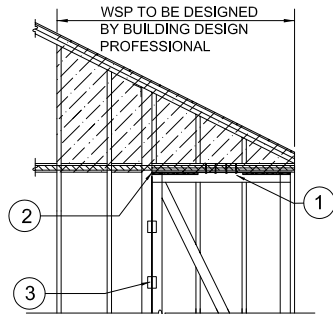
SHEAR WALL SYSTEM
1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com



DATE:
1-1-2016

HFX4

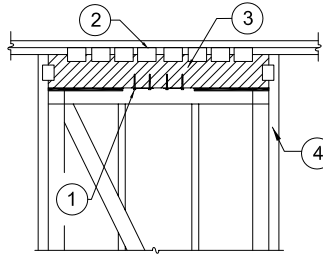
BUILDING DESIGN PROFESSIONAL MUST DESIGN:
 A. STUDS OR STRAPS TO TRANSFER UPLIFT OF FILLER MATERIAL
 B. ADDITIONAL DRIFT DUE TO THE ADDITIONAL FILLER HEIGHT
 C. STUDS/POST AT EACH END OF BRACE FRAME FOR OUT OF PLANE LOAD
 D. IF SPLICE OCCURS AT TOP PLATES, FASTENING MUST DEVELOP TENSILE STRENGTH IN LUMBER



1. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS OR EQUAL PER TABLE
2. STRAPS BY BUILDING DESIGN PROFESSIONAL
3. ADJACENT FRAMING AND CONNECTIONS FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL

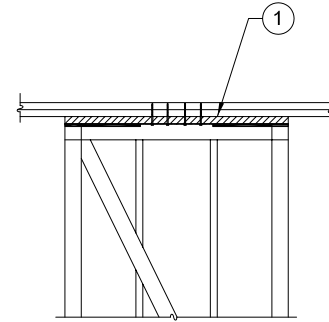
RAKE FILLER ④

FOR FILLERS LARGER THAN 1 1/2", ENGINEER OF RECORD TO DESIGN:
 A. STUDS OR STRAPS TO TRANSFER UPLIFT OF FILLER MATERIAL
 B. ADDITIONAL DRIFT DUE TO THE ADDITIONAL FILLER HEIGHT
 C. STUDS/POST AT EACH END OF BRACE FRAME FOR OUT OF PLANE LOAD
 D. IF SPLICE OCCURS AT TOP PLATES, FASTENING MUST DEVELOP TENSILE STRENGTH IN LUMBER



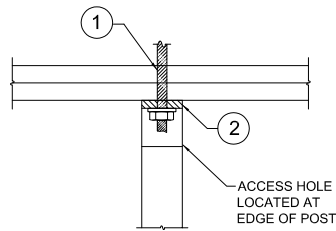
1. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS OR EQUAL PER TABLE
2. USP MP4F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
3. 4x WOOD FILLER BY BUILDING DESIGN PROFESSIONAL
4. ADJACENT FRAMING FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL

4X FILLER ③



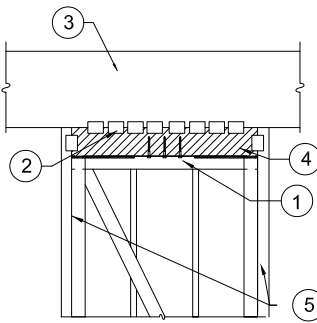
1. 2x WOOD FILLER CONNECTION WITH 1/4" DIAMETER (MINIMUM) x 4 1/2" LONG USP-WS SCREWS OR EQUAL

2X FILLER ②



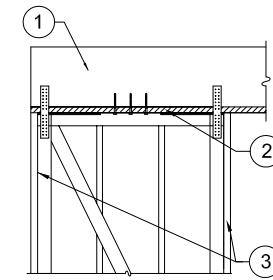
1. THREADED ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT CONNECTING TO HOLD DOWN ABOVE
2. 3/4" THICK PLATEWASHER BUILT IN BY MANUFACTURER

POST TO TOP PLATES ⑧



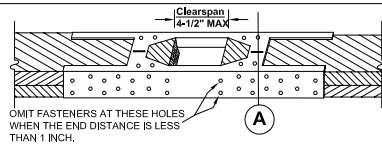
1. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
2. USP MP4F CONNECTORS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
3. CONTINUOUS HEADER PER PLAN
4. 4x WOOD FILLER BY BUILDING DESIGN PROFESSIONAL
5. ADJACENT FRAMING FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL

HEADER - 4x FILLER ⑦



1. CONTINUOUS HEADER PER PLAN
2. 2x WOOD FILLER CONNECTION WITH 1/4" DIAMETER (MINIMUM) x 4 1/2" LONG USP-WS SCREWS OR EQUAL
3. ADJACENT FRAMING FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL

HEADER - 2x FILLER ⑥



OMIT FASTENERS AT THESE HOLES WHEN THE END DISTANCE IS LESS THAN 1 INCH.



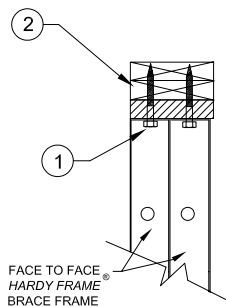
Section A : HFS Installed over Double Top Plates
A - Alternate 1 : HFS Installed over Underside of Double Top Plates
A - Alternate 2 : HFS Separated into Two "L" Shapes to allow for Installation over Wood Structural Panel Sheeting or for Installation at 2x6 and Greater Wall Depths.

Table 8.1 : Hardy Frame® Saddle

| Model Number | Fastener Qty | ASD Tension (lbs) | ASD Compression (lbs) |
|--------------|-----------------|-------------------|-----------------------|
| HFS24 | 24 - 16d common | 2950 | 2500 |
| HFS36 | 32 - 16d common | 4280 | 2500 |

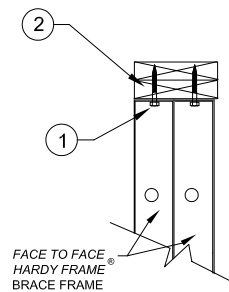
- Notes:**
- 1) Maximum Clearspan splice is 4-1/2"
 - 2) Fastener quantity is the number of 16d common nails to be installed at each end of the splice.
 - 3) When the distance from the splice to the first nail hole is less than 1 inch, omit the (2) nails in the 3 inch sideplate and the (1) nail in the 1-1/2 inch sideplate closest to the splice.
 - 4) For the HFS24 that is installed with 22 - 16d common nails on each end of the splice (44 total) there is no reduction in the values.
 - 5) For the HFS36 that is installed with 31 - 16d common nails on each end of the splice (62 total) there is no reduction in the values.
 - 6) Allowable tension capacity is based on attachment to lumber with a minimum specific gravity of 0.49.
 - 7) Loads shown are allowable stress design (ASD) and exclude a 1.33 stress increase.

HARDY FRAME SADDLE ⑫



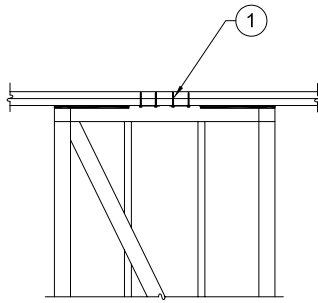
1. 2x WOOD FILLER CONNECTION WITH 1/4" DIAMETER (MINIMUM) x 4 1/2" LONG USP-WS SCREWS OR EQUAL
2. COLLECTOR BY BUILDING DESIGN PROFESSIONAL

BACK TO BACK 2x FILLER ⑪



1. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
2. COLLECTOR BY BUILDING DESIGN PROFESSIONAL

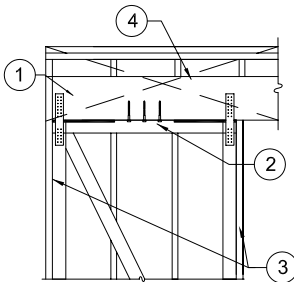
BACK TO BACK TOP PLATES ⑩



1. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE

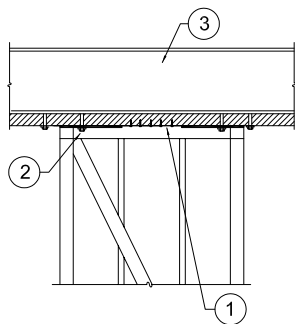
TOP PLATE 1

NOTE:
STRAPS CONNECTING PANEL TO HEADER ARE RECOMMENDED. WHEN APPLIED IN THE FIELD STRAP DESIGN AND CONNECTION TO BE DETERMINED BY BUILDING DESIGN PROFESSIONAL.



- 1. CONTINUOUS HEADER PER PLAN
- 2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
- 3. ADJACENT FRAMING FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL
- 4. SHEAR TRANSFER DESIGN AND DETAILS BY THE BUILDING DESIGN PROFESSIONAL

HEADER - CRIPPLES 5



- 1. 1/4" DIAMETER (MINIMUM) USP-WS SCREWS (OR EQUAL) FOR SHEAR TRANSFER FROM WOOD TO HARDY FRAME® BRACE FRAME
- 2. CONNECTION BY BUILDING DESIGN PROFESSIONAL
- 3. STEEL BEAM PER PLANS

STEEL BEAM W/NAILER 9

Table 1.0 Hardy Frame® HFX-Series Product Data and Connectors

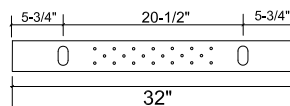
| MODEL NUMBER | NET HEIGHT (in) | DEPTH (in) | Hold Down Diameter ^{1,2} (In) | Top Screw ³ Qty (ea) | Bottom Screw ⁴ Qty (ea) | Screw Qty Available at Edges (ea) |
|--------------|-----------------|------------|--|---------------------------------|------------------------------------|-----------------------------------|
| HFX-32x8 | 92-1/4 | 3-1/2 | 7/8 | 32" Width = 10 | 32" Width = 10 | NA |
| HFX-44x8 | 104-1/4 | | | | | |
| HFX-32x9 | | | | | | |
| HFX-44x9 | | | | | | |
| HFX-32x10 | 116-1/4 | | | | | |
| HFX-44x10 | | | | | | |
| HFX-32x11 | 128-1/4 | | | | | |
| HFX-44x11 | | | | | | |
| HFX-32x12 | 140-1/4 | | | | | |
| HFX-44x12 | | | | | | |
| HFX-32x13 | 152-1/4 | | | | | |
| HFX-44x13 | | | | | | |

¹ Standard Hold down bolts must have a 1/2"x3"x3" ASTM A 36 plate washer double nutted on the embed end that connects to the Panel or Brace Frame base with one Hardened Round, two Round-Flat or two SAE Washers and a Grade 8 Hex Nut on each rod or as specified by the Building Design Professional.

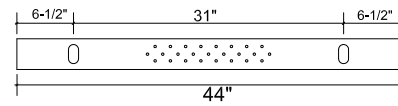
² High Strength Hold Down bolts can be ASTM A 193 Grade B7 (or specified by the Building Design Professional) with 1/2"x3"x3" ASTM A 36 Plate Washers double nutted on the embed end that connects to the Panel or Brace Frame base with one Hardened Round, two Round-Flat or two SAE Washers and a Grade 8 Hex Nut on each rod.

³ 1/4" diameter USP-WS Series screws (or equal). Length is 3" (minimum) when attached directly to the collector and 4-1/2" (minimum) when installing a 2x filler above the Brace Frame.

(A)



32" BRACE FRAME



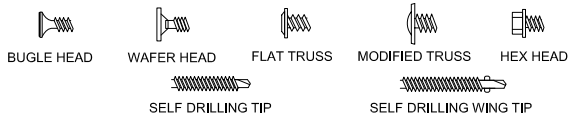
44" BRACE FRAME

HOLE PATTERN TOP & BOTTOM

(B)

#12 SELF-TAPPING SCREWS AT EDGE OF BRACE FRAME. (BUGLE HEAD WITH SELF DRILLING WING TIP SHOWN)

#10 SELF-TAPPING SCREWS AT FACE OF BRACE FRAME. (BUGLE HEAD WITH SELF DRILLING TIP SHOWN)



NOTES:

- 1) SURFACE FINISHES, CONNECTORS AND FIXTURES ARE ATTACHED TO THE BRACE FRAME FACE WITH # 10 SELF-TAPPING SCREWS SPACED NO LESS THAN 2-1/4" OC.
- 2) ATTACHMENTS TO THE BRACE FRAME EDGES ARE MADE WITH # 10 SELF-TAPPING SCREWS.
- 3) STRUCTURAL CONNECTIONS ARE TO BE DESIGNED BY THE BUILDING DESIGN PROFESSIONAL.
- 4) STRUCTURAL HARDWARE USED TO TRANSFER LOADS SHOULD NOT EXCEED 12 GAGE.

(C)

Framing Details — HFX Brace Frames

THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

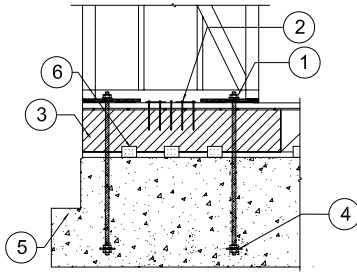
HARDY FRAME
SHEAR WALL SYSTEM
1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com



DATE:
1-1-2016

HFX5

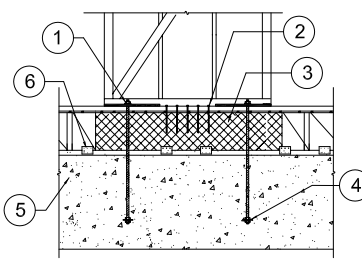
NOTE: COUPLING NUTS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



1. HARDENED ROUND (2) SAE OR (2) FOUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. 1/4" DIAMETER (MINIMUM) x 4 1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
3. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT
4. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" x 3" PLATE WASHER & 2-NUTS AT EMBED END PER PLAN
5. FOUNDATION DESIGN BY THE DESIGN PROFESSIONAL
6. USP MP4F CONNECTORS OR EQUAL BY THE DESIGN PROFESSIONAL

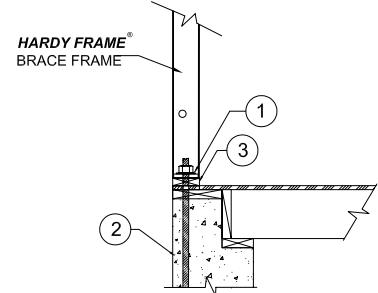
RAISED-OS CORNER ④

NOTE: COUPLING NUTS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



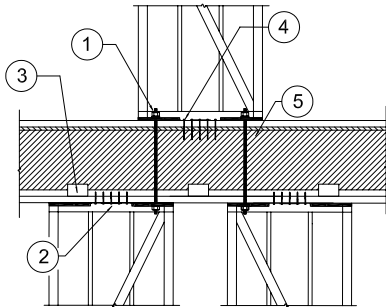
1. HARDENED ROUND (2) SAE OR (2) FOUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. 1/4" DIAMETER (MINIMUM) x 4 1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
3. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT
4. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" x 3" PLATE WASHER & 2-NUTS AT EMBED END PER PLAN
5. FOUNDATION DESIGN BY THE DESIGN PROFESSIONAL
6. USP MP4F CONNECTORS OR EQUAL BY THE DESIGN PROFESSIONAL

RAISED FLOOR ③



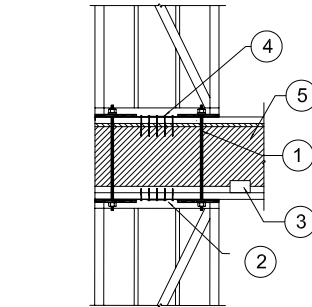
1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
2. FOUNDATION DESIGN BY BUILDING DESIGN PROFESSIONAL
3. 2x BOTTOM PLATE BELOW BRACE FRAME

RAISED STEM WALL ②



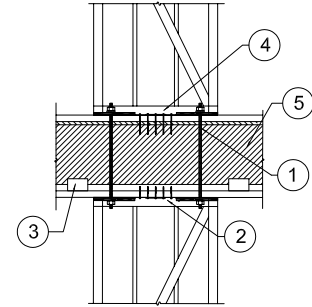
1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
3. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
4. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
5. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT

PYRAMID STACK ⑧



1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
3. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
4. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
5. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT

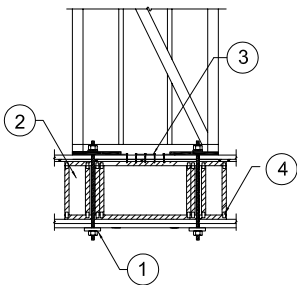
STACK @ OS CORNER ⑦



1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
3. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
4. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
5. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT

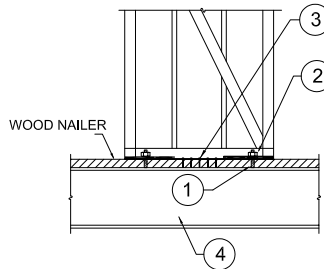
STRAIGHT STACK ⑥

NOTE:
A. INSTALLATION WITHOUT A SOLID 4X RIM SHALL CONSIDER COMPRESSION FROM OVERTURNING, AND SHEAR TRANSFER FROM THE BASE OF BRACE FRAME TO THE TOP PLATES OF THE WALL BELOW.
B. TRUSS DESIGN PROFESSIONAL TO CHECK LATERAL SHEAR AND OVERTURNING MOMENT OF TRUSS SYSTEM.



1. THREADED ROD HOLD DOWN WITH PLATE WASHER AS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL AT UNDERSIDE OF BEAM PER PLANS
2. END BLOCK CONFIGURATION MAY CHANGE TO ACCOMMODATE SPECIFIC JOB CONDITIONS
3. 1/4" DIAMETER (MIN.) USP-WS SCREWS (OR EQUAL) MAY BE INSTALLED FOR ADDITIONAL SHEAR TRANSFER
4. TRUSS DESIGN AND CONNECTIONS BY TRUSS DESIGN PROFESSIONAL

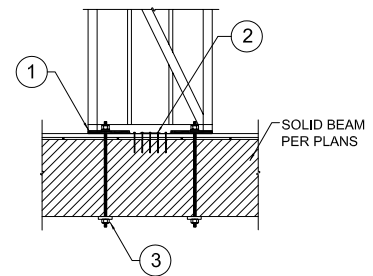
OPEN WEB TRUSS ⑩



1. 7/8" HOLD DOWN BOLT WELDED TO STEEL BEAM (BY BUILDING DESIGN PROFESSIONAL)
2. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT
3. 1/4" DIAMETER (MIN.) USP-WS SCREWS (OR EQUAL) MAY BE INSTALLED FOR ADDITIONAL SHEAR TRANSFER
4. STEEL BEAM BY BUILDING DESIGN PROFESSIONAL

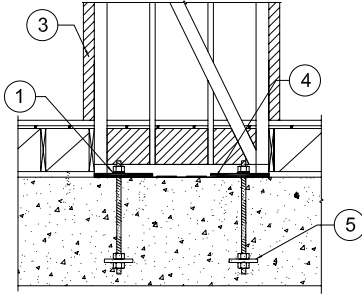
STEEL BM-WELDED HD ⑬

BUILDING DESIGN PROFESSIONAL TO DESIGN
A. LOAD PATH FROM BEAM TO FOUNDATION.
B. BEAM DEFLECTION MAY INCREASE TOTAL DRIFT OF BRACE FRAME, BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.



1. 3/4" THICK STEEL PLATE WASHER BUILT INTO BOTTOM OF BRACE FRAME (BY MANUFACTURER)
2. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
3. THREADED ROD HOLD DOWN WITH PLATE WASHER AS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL AT UNDERSIDE OF BEAM PER PLANS

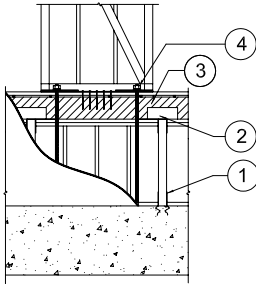
WOOD BM THRU BOLT ⑫



1. HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUT.
2. FOUNDATION DESIGN BY THE DESIGN PROFESSIONAL
3. ADJACENT FRAMING FOR RESISTING OUT OF PLANE LOADS BY BUILDING DESIGN PROFESSIONAL
4. MOISTURE BARRIER RECOMMENDED (USE 15# FELT, OR EQUIVALENT)
5. 7/8" DIAMETER HOLD DOWN BOLT WITH 1/2" THICK x 3" x 3" PLATE WASHER & 2-NUTS AT EMBED END PER PLAN.

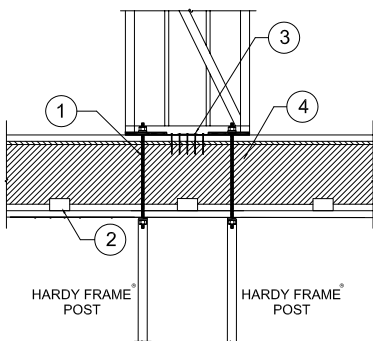
RAISED FL. HEAD-OUT ①

NOTE: COUPLING NUTS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



- 1) USP POST BASE BY THE DESIGN PROFESSIONAL
- 2) USP POST CAP BY THE DESIGN PROFESSIONAL
- 3) 4x (MIN) RIM AND STRUCTURAL FRAMING BY THE DESIGN PROFESSIONAL
- 4) 1 EA. HARDENED ROUND, 2 EA. SAE OR 2 EA. ROUND-FLAT WASHERS AND 1 EA. GRADE 8 HEX NUT.

CRIPPLED WALL ⑤



1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
3. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
4. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT

POSTS BELOW ⑪

Table 1.0 Hardy Frame® HFX-Series Product Data and Connectors

| MODEL NUMBER | NET HEIGHT (in) | DEPTH (in) | Hold Down Diameter ^{1,2} (in) | Top Screw ³ Qty (ea) | Bottom Screw ⁴ Qty (ea) | Screw Qty Available at Edges (ea) |
|--------------|-----------------|------------|--|---------------------------------|------------------------------------|-----------------------------------|
| HFX-32x8 | 92-1/4 | 3-1/2 | 7/8 | 32" Width = 10 | 32" Width = 10 | NA |
| HFX-44x8 | | | | | | |
| HFX-32x9 | | | | | | |
| HFX-44x9 | | | | | | |
| HFX-32x10 | | | | | | |
| HFX-44x10 | | | | | | |
| HFX-32x11 | 116-1/4 | | | | | |
| HFX-44x11 | 128-1/4 | | | | | |
| HFX-32x12 | 140-1/4 | | | | | |
| HFX-44x12 | 152-1/4 | | | | | |
| HFX-32x13 | | | | | | |
| HFX-44x13 | | | | | | |

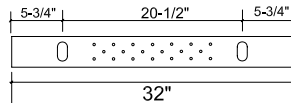
- ¹ Standard Hold down bolts must have a 1/2"x3"x3" ASTM A 36 plate washer double nutted on the embed end that connects to the Panel or Brace Frame base with one Hardened Round, two Round-Flat or two SAE Washers and a Grade 8 Hex Nut on each rod or as specified by the Building Design Professional.
- ² High Strength Hold Down bolts can be ASTM A 193 Grade B7 (or specified by the Building Design Professional) with 1/2"x3"x3" ASTM A 36 Plate Washers double nutted on the embed end that connects to the Panel or Brace Frame base with one Hardened Round, two Round-Flat or two SAE Washers and a Grade 8 Hex Nut on each rod.
- ³ 1/4" diameter USP-WS Series screws (or equal). Length is 3" (minimum) when attaching directly to the collector and 4-1/2" (minimum) when installing a 2x filler above the Brace Frame.
- ⁴ 1/4" diameter USP-WS Series screws (or equal). Length is 4-1/2" (minimum) through base of Brace Frame.

A

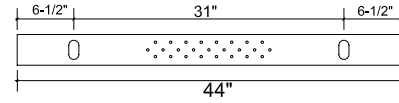
INSTALLATION ON FLOOR SYSTEMS

- A) Install a solid 4x (min) rim in floor system for bearing. Table values assume Engineered Wood Product (EWP).
 - B) After the floor is sheeted, cut and plot the bottom plate as in the first floor installation or plate can be continuous.
 - C) Use all thread to connect the corners of the second floor Frame to a Brace Frame, Panel or Post below.
 - D) Secure the base of the Frame with 1/4x4 1/2" (Minimum) Screws. See Tables for minimum quantities.
 - E) When Framing, Plumb & Line are complete, Install 1/4x3" (Min) screws through the top channel into the collector.
- NOTE: Installations may vary with specific job conditions and/or specifications by the Building Design Professional.

B

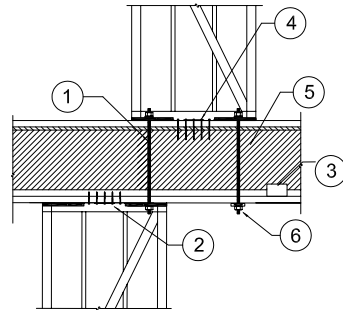


32" BRACE FRAME



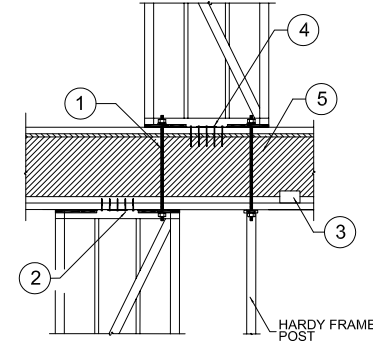
44" BRACE FRAME

HOLE PATTERN TOP & BOTTOM ③



1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
3. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
4. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
5. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT
6. THREADED ROD HOLD DOWN WITH PLATE WASHER AS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL AT UNDERSIDE OF BEAM PER PLANS

STAGGERED-THRU BOLT ⑩



1. 7/8" DIAMETER ROD WITH HARDENED ROUND, (2) SAE OR (2) ROUND-FLAT WASHERS AND GRADE 8 HEX NUTS AT BOTH ENDS
2. 1/4" DIAMETER (MINIMUM) x 3" LONG USP-WS SCREWS (OR EQUAL) PER TABLE
3. USP MP4F CONNECTIONS OR EQUAL BY BUILDING DESIGN PROFESSIONAL
4. 1/4" DIAMETER (MIN.) x 4-1/2" LONG USP-WS SCREWS (OR EQUAL) PER TABLES
5. 4x MINIMUM RIM, TABLES SPECIFY ENGINEERED WOOD PRODUCT

STAGGERED TO POST ⑨

Floor System Details — HFX Brace Frames

THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

HARDY FRAME
SHEAR WALL SYSTEM

1732 PALMA DRIVE, SUITE 200, VENTURA, CA 93003
TELEPHONE: 800 754-3030 / www.hardyframe.com



DATE:
1-1-2016

HFX6

SidePlate Code Evaluations

Included in the Standard AISC 358

Hardy Frames introduced the first standardized, prefabricated Special Moment Frame in 2006. Since then we have delivered thousands of Moment Frames that have been successfully installed. Our Special Moment Frames provide maximum structural capacities and enable large openings in architectural design.

Hardy Frame® Special Moment Frames utilize the SidePlate moment connection which has now been approved by the Connection Prequalification Review Panel (CPRP) for inclusion in the AISC 358 Prequalified Moment Connection Standard. Typically, **Hardy Frame®** Special Moment Frames are delivered to the jobsite in one-piece, completely prefabricated with wood nailers attached, and ready to be installed with no assembly. No field welding and or special inspection is required.

On production framing jobs the **Hardy Frame®** Special Moment Frame can't be beat. We have delivered truckload quantities of up to 30 Moment Frames that were installed in a single day. That is an accomplishment that cannot be matched by conventional or assembly-required moment frames.

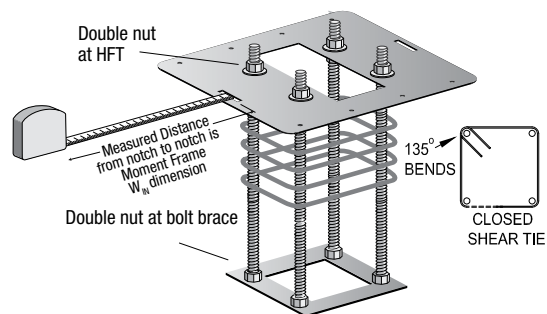
Custom Sizes and Custom Calculations

We offer over 300 standard dimension Special Moment Frames, but we don't stop there. We also offer calculations and solutions for sizes beyond our standard listing. We commonly provide solutions for two-story and multi-story frames as well as for fixed base connections.

At Hardy Frames we understand that Moment Frames require job-specific considerations. We work with contractors to meet their needs without treating adjustments as a custom order.

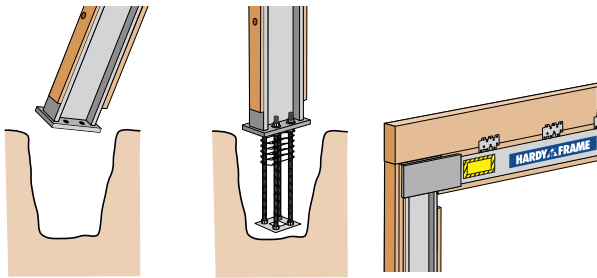
Moment Frame Template Kits

Template Kits are included with the purchase of the **Hardy Frame®** Special Moment Frame and are a stock item that can be shipped within one business day. The Kit includes all embed anchors, nuts, washers and Templates so the concrete pour can proceed prior to the Moment Frame delivery. Correctly locating the anchors is easy with a slot provided in the Template to measure the " W_{in} ", (inside steel-to-steel) dimension.



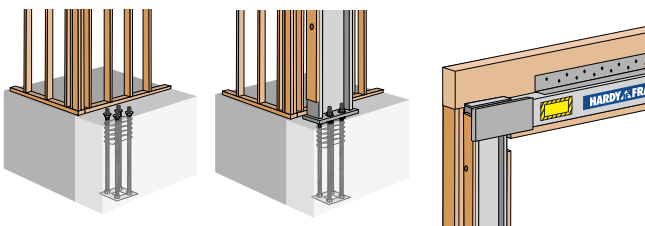
Installation inside an existing wall line

1. Dig footing pads or grade beam per the plan.
2. Tilt Moment Frame and lower both columns bases into the open trench.
3. Rotate top of Frame until it is vertical, raise to desired position then temporarily shore the Frame in place.
4. Assemble the Template Kit per Hardy Frame Details.
5. Install all hold down anchors in the base plates and assemble.
6. With reinforcement required by the EOR in place (not shown) pour concrete up to the bottom of the column base plates.
7. Install USP MP4F connectors to transfer shear from the existing collector to the MF Beam per the plan specifications by the Engineer of Record.



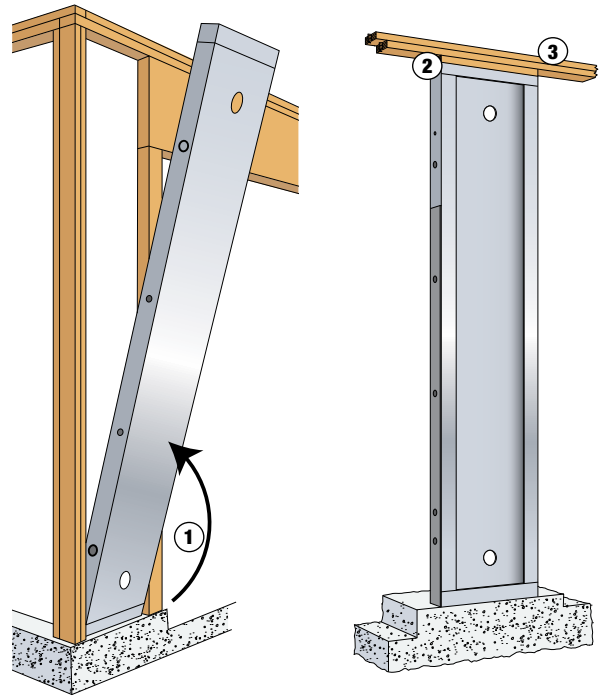
Installation outside an existing wall line

1. Dig footing pads or grade beam per the plan.
2. Assemble the Template Kit per Hardy Frame Details.
3. Locate assembled Template Kits at each of the column locations and orient Templates with the slotted holes positioned for measuring the inside opening width (Win)
4. Measure the interior "slot to slot" distance to be the same as the "Win" (inside steel to steel) dimension for the Frame being installed.
5. Set the anchors to be 4-1/4 inches (minimum) above top of concrete
6. With reinforcement required in place (not shown) pour concrete.
7. Install one nut with one washer above on all anchors position washers at approximately 1-1/2 inches above top of concrete
8. Set Moment Frame then place washers in contact with the top of base plate and install nuts above
9. Level the Frame and make height adjustments by raising or lowering the nuts below the base plate. Check to be sure the pre-attached angle above the MF beam is in contact with the outside (or inside) face of wall per the plan specification by the Engineer of Record. All nuts must be "snug tight"
10. Install screws horizontally through the angle into the existing wood structure



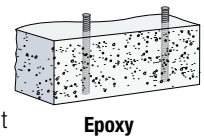
Panel Installation

1. Tilt Panel, lift over bolts and swing into the existing space
2. Install 2x filler at 1-1/2" gap
3. Connect with 1/4 x 4-1/2 USP WS-Series Screw



Epoxy

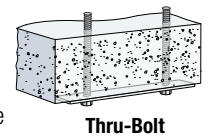
CIA GEL7000-C epoxy has an ICC-ES evaluation report (ESR-3609) for design in seismic categories A-F for use in cracked and un-cracked concrete. The engineer of records design will take into account concrete edge distances, end distances and the amount of combined tension and shear needed to resist the forces transferring from the Hardy Frame Shear Panel to the existing foundation.



Epoxy

Thru-Bolt

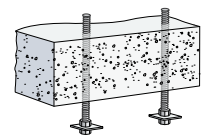
The design, including capacity of existing concrete and size of Bearing Plates below is determined by the engineer of record. The adjacent illustration shows installation with a Hardy Frame Bearing Plate (HFXBP) at the underside of concrete.



Thru-Bolt

New Footing Below

Hardy Frame unreinforced or reinforced anchorage solutions may be used below existing concrete or to replace existing concrete.



New Footing Below

Introducing **MiTek Builder Products**

MiTek Builder Products is a new division of MiTek USA, Inc. that has been formed to unify related products, technologies and services around a single goal:

To serve our customers seamlessly with industry-leading technological innovation, products and support, and a passionate commitment to our customers' success.

A Streamlined Team

The new MiTek Builder Products division combines three companies that were previously independent: USP Structural Connectors, Hardy Frame Shear Walls, and Z4 Continuous Tie-Down Systems. Like other MiTek product lines, the Builder Products division is aligned in its purpose, supported by a centralized infrastructure of manufacturing capacity, software development and technical support in the market.

Better Technology, Better BuildingSM

The MiTek Builder Products division serves the construction industry with an extensive offering of innovative products and solutions. These are designed to provide a full range of structural connections and design tools. Products, software and construction methods work together to offer an optimized structure and a more efficient construction process.

- Designers will recognize the advantage of support and solutions across the product lines.
- Builders benefit from specified solutions that dovetail from one component to the next throughout the load path of the building.
- Lumber and Building Material Dealers will experience increased crossover solutions when providing 'whole-house' approach.



The Z4 "Continuous Tie-Down System" features Cinch Nut™, an innovative wood shrinkage/deformation take-up device. It ratchets down all threaded rods in the non-load direction as framing elements change dimensions over time.



Hardy Frame™ is the industry leading pre-fabricated shear wall system. Building design professionals specify the Hardy Frame System not only to resist wind and earthquake loads, but to also maximize wall openings economically. The Hardy Frame product line includes Panels, Brace Frames and Moment Frames.



The USP brand offers builders and engineers a comprehensive line of code evaluated connectors, framing hardware, fasteners, anchors and epoxy solutions for the residential, commercial construction and DIY markets. USP offers more than 4,000 SKUs backed by innovative software solutions, professional engineering, technical support, and a sales team across the US and Canada.

The MiTek Story

MiTek resources run deep. We began with the innovation of the first 'Gang-Nail' plate in 1954 then evolved through the acquisition and merging of a range of high quality companies. Today we are recognized as the world's leading supplier of software, structural connectors, engineering services and automated manufacturing equipment to the component manufacturing industry. MiTek's reputation as an innovative market leader, committed to the success of its customers, continues to grow.

Owned by Warren Buffett's Berkshire Hathaway, MiTek's growth and acquisitions have allowed us to pursue a vision that extends to the residential sector and beyond. Today our company also serves the commercial and industrial construction sectors with a consistent character of innovation, lasting values and enduring relationships.

Your success is our success.SM

MiTek is the leading provider of structural connectors, software, and a range of engineered products to component manufacturers and building material suppliers in the residential construction industry. The USP legacy of innovation dates back to 1933 when the original timber connectors were conceived and standardized. Over the years the legacy grew by combining TECO, Silver, Lumberlok, Kant Sag, Hughes, Covert and Renown, some of the most recognizable brands in the industry. These brands combined through the years to eventually form one company - "United Steel Products". In March, 2011 USP Structural Connectors was purchased by MiTek USA, Inc., a Berkshire Hathaway subsidiary.

Today, USP Structural Connectors is the branded product line from MiTek that provides a complete line of code approved engineered structural connectors, anchoring solutions, and design software solutions for the residential, commercial and DIY markets. The USP product line offers more than 4,000 SKUs that are made in the USA, and backed by professional engineering technical support and a sales team that serves the United States and Canada.



Over 4000 SKUS made in the USA



Gold Coat offers 2X the Corrosion Protection



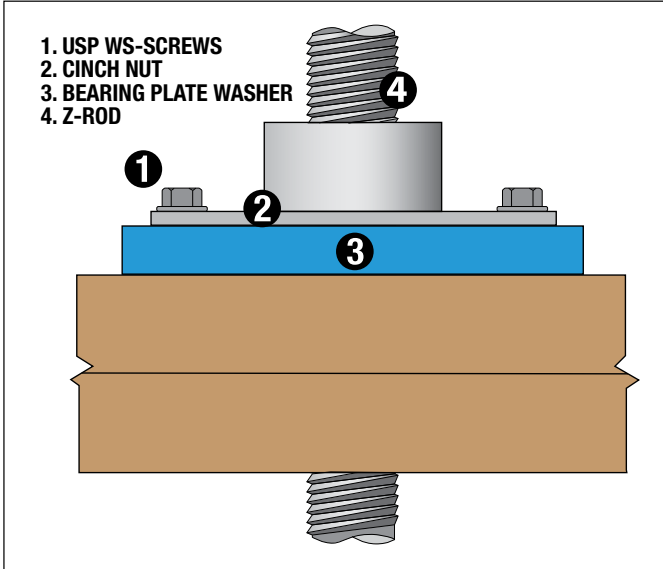
FWH Series Fire Wall Hanger attaches floor framing to two-hour, fire-rated wall assemblies in wood-frame construction



Complete line of high-performance epoxy applications

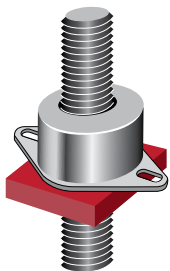


THFI joist hanger combines ease of installation with the flexibility of a face mount hanger

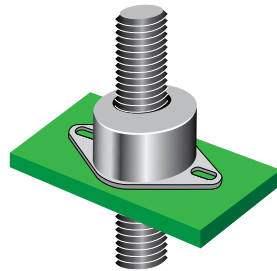


Z4 Tie-Down Systems utilize CNX-Series Cinch Nuts to compensate for wood shrinkage and building settlement that cause connections to loosen over time. The Cinch Nut uses a self-ratcheting action that permits the cinch nut to move (the rod doesn't move) or "travel" perpetually in one direction only down the rod. Available for installation with threaded rods that are 3/8 inch through 1-1/2 inch diameter in 1/8 inch increments, the CNX Cinch Nut has been code evaluated and published in ESR-2190.

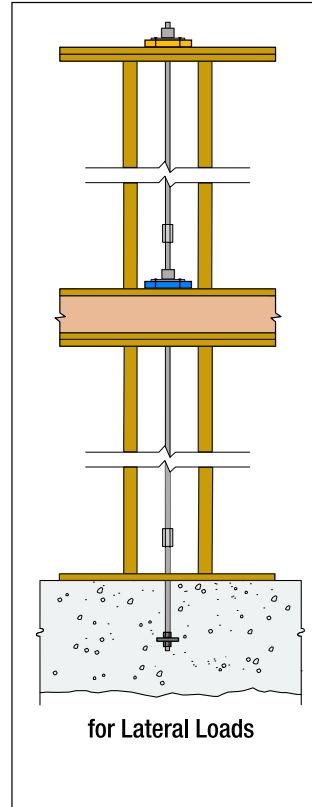
- Place the specified Bearing Plate Washer onto the bottom plate of a wood framed wall.
- With the "wings" oriented downward, place Cinch Nut over the Z-Rod extending from below and push down until it seats firmly on the Bearing Plate Washer.
- Install 1/4 inch diameter USP WS-Series screws through the wings, penetrating 1 -1/2 inches (minimum) into the wood bottom plate.
- Model numbers BPW5 and BPW6 fit in-between the screws fastening the wings.
- Model numbers BPW7 (3-1/4 x 4-3/8) and larger are provided with two screw holes. Align the wing and the Bearing Plate Washer screw holes to allow installation of 1/4 inch diameter WS-Series screws.



BPW5, BPW6 Installation

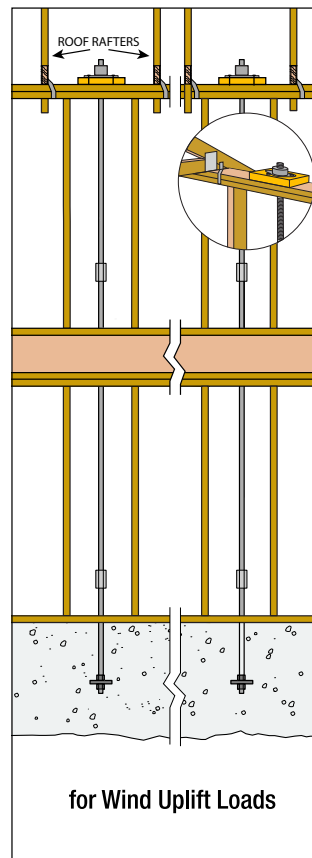


BPW7 and larger Installation



Z4 Tie-Down System for Lateral Loads

To resist tension loads due to overturning moments in multi-story buildings the CNX Cinch Nut is installed over a Bearing Plate Washer at each level in a fast and easy application. At the upper-most level a Cinch Nut is installed over a Bearing Plate Washer above the top plates. At walls below that bear on wood floor systems, the Cinch Nut and Bearing Plate Washer are installed over the bottom plate. Tension loads are gathered at each level and transferred into the foundation through a continuous system of Cinch Nuts, Bearing Plate Washers, Z-Rods/ATRs and Couplers all available from **MiTek® Builder Products.**

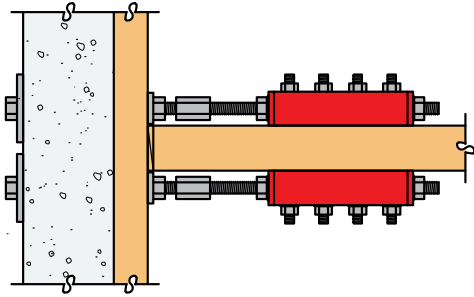


Z4 Tie-Down System for Wind Uplift

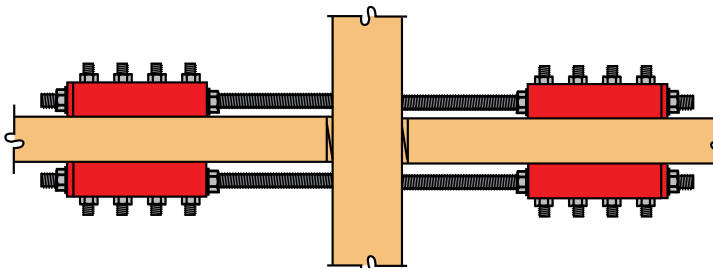
For resisting roof uplift loads resulting from wind the Z4 Cinch Nut is installed over a Bearing Plate Washer above the top plates with roof framing above to create a tie-down system. Uplift forces are transferred into a continuous system of Z-Rods / ATRs and Couplers that form a load path to the foundation.

Code Reports

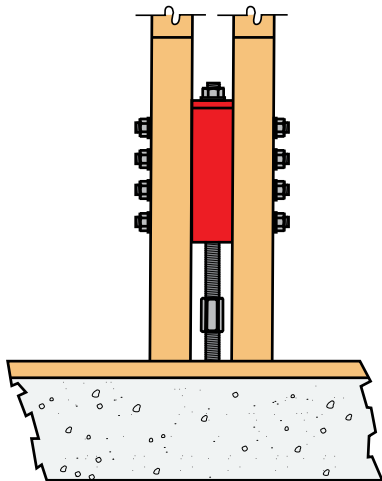
- ESR-3105
- LA City RR 25334



Paired CT Wall Tie



Paired CT Purlin Tie



**Sandwiched T2
As Concentric
Hold-Down**

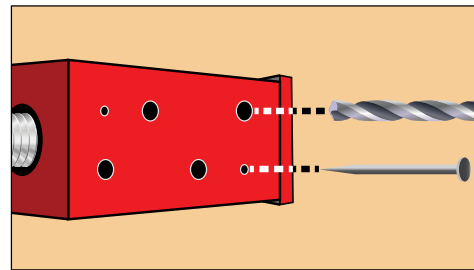
Z4-CT 2 4 - 4

- Anchor Rod Dia. (1/8" Increments)
- Fastening Bolt Dia. (1/8" Increments)
- Fastening Bolt Quantity
- Continuity Tie

Z4 Continuity Tie

The Z4 "CT" is a steel tube with steel end plates welded to both ends designed to transfer tension and compression forces from one beam to another (Purlin Splice application) or from a beam to a perpendicular wall (Wall Tie application). Connections are made by bolting the tube to a wood member and attaching to a threaded rod for transferring forces.

Accurate Placement and Installation



Step 1: Use the two 3/16" holes provided to nail CT or T2 at desired location on wood member

Step 2: Use the CT or T2 as a template to accurately drill holes for bolting

Step 3: Make bolted connection to the wood member per plans and specifications

Step 4: Make threaded rod connection per plans and specifications.

Z4 Tension Tie

The Z4 "T2" is a steel tube with a steel end plate welded to one end designed to transfer tension forces with a single concentric hold-down device. Sandwiched Installations are made by through bolting two wood members with a T2 between. The tube is then attached to a threaded rod to transfer the tension loads.

Z4-T2 - 4 8 - 9

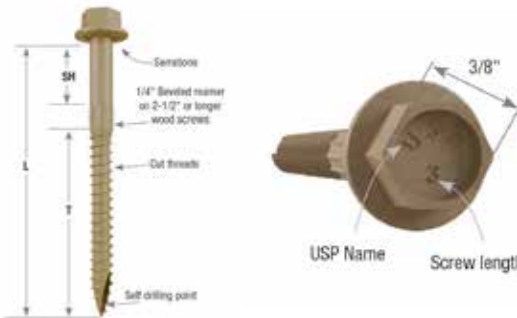
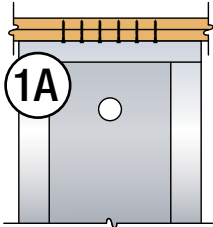
- Anchor Rod Dia. (1/8" Increments)
- Fastening Bolt Dia. (1/8" Increments)
- Fastening Bolt Quantity
- Tension Tie

Hardy Frame recommends USP Structural Connectors for use with Hardy Frame Panels, Brace Frames and Special Moment Frames.



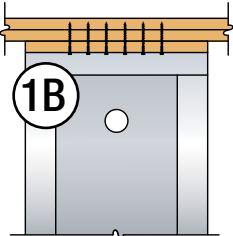
WS-1/4" x 3" Screws

For connection directly to top plates



WS-1/4" x 4-1/2" Screws

For 2x filler above

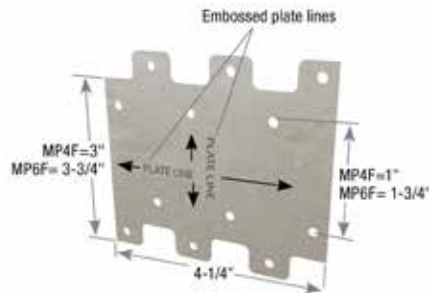
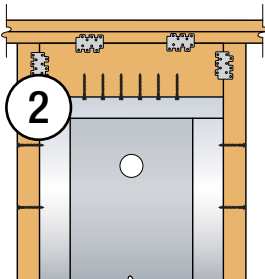


| USP Stock No. | Description | Dimensions (in) | | | | Finish | Allowable Shear (160%) | |
|---------------|---------------|-----------------|-------|-------|--------|--------|------------------------|----------------------|
| | | L | SH | T | Thread | | 12 GA Steel to DF-L/SP | 12 GA Steel to S-P-F |
| WS3 | 1/4" x 3" | 3 | 3/4 | 2-1/4 | 2 | Zinc | 668 lbs | 475 lbs |
| WS45 | 1/4" x 4-1/2" | 4-1/2 | 1-1/4 | 3-1/4 | 3 | Zinc | 825 lbs | 673 lbs |

1. Allowable loads have been increased 60% for wind or seismic loads; no further increase shall be permitted.
2. Zinc finish = Yellow Zinc Dichromate.
3. Code Approved by ICC Evaluation Service (ESR-2761), LA City (RR-25850), and State of Florida (FL-16091).

"MP4F" Plate Connector

For 4x filler above

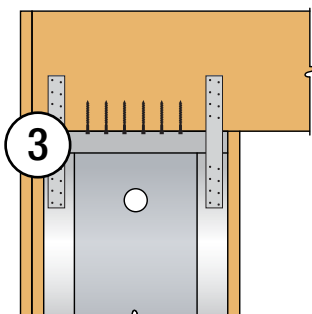


| USP Stock No. | Steel Gage | Orientation | Fastener Schedule | | Direction of Load | Allowable Shear (160%) | |
|---------------|------------|-------------|-------------------|------------|-------------------|------------------------|---------|
| | | | Each Member | | | DF-L/SP | S-P-F |
| | | | Qty | Type | | | |
| MP4F | 20 | H | 6 | 8d x 1-1/2 | H | 845 lbs | 710 lbs |

1. Allowable loads have been increased 60% for wind or seismic loads; no further increase shall be permitted.
2. 8d nails are .131" dia. x 1-1/2" long, minimum embedment shall be 1-5/16".
3. Code Approved by ICC Evaluation Service (ESR-3455), LA City (RR-25779), and State of Florida (FL-821).

"KRPS" Straps

For Portal condition with #10 self-tapping screws to Panel and 16d nails to header



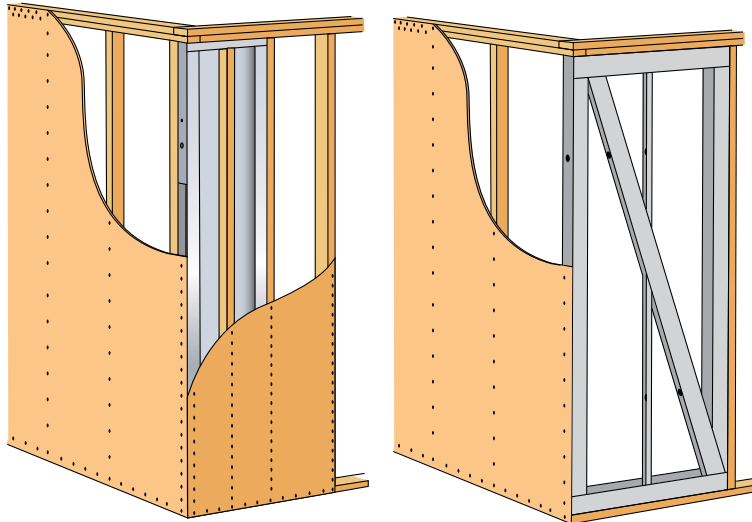
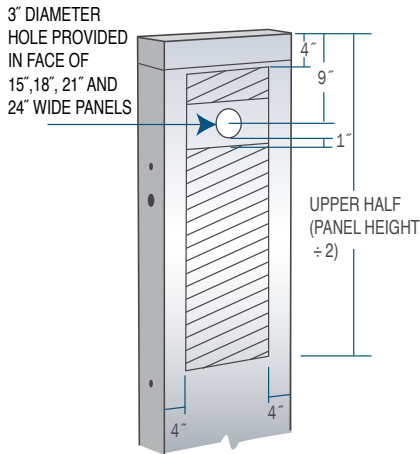
| USP Stock No. | Steel Gage | Dimensions (in) | | Fastener Schedule | | Allowable Tension (160%) |
|---------------|------------|-----------------|---------|-------------------|-----------|--------------------------|
| | | W | L | #10 Screws | 16d Nails | DF-L/SP |
| KRPS18 | 16 | 1-1/2 | 18-5/16 | 6 | 6 | 1325 lbs |
| KRPS22 | | | 22-5/16 | 8 | 8 | |
| KRPS28 | | | 28-5/16 | | | 1720 lbs |

1. Allowable loads have been increased 60% for wind or seismic loads; no further increase shall be permitted.
2. 16d nails are .162" dia. x 3-1/2" long, minimum embedment shall be 1-5/8".
3. #10 Hex Head self-tapping screws with a Self Drilling (SD) point are recommended into face of Panel.

Hole Chart

An additional 1" diameter hole may be drilled in the upper half of the Panel when it is located in the hatched area.

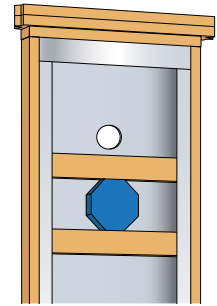
To drill more than one hole, a larger diameter hole or a hole in a location outside of the hatched area, contact Hardy Frames.



Fixture Installation

2x4 Wall Framing

- There is no "inside or outside face" of Hardy Frame Panels.
- Install with the cavity face of Panel oriented in the direction of the fixture to be attached
- Install 2x backing in the cavity and secure with #10 (minimum) self-tapping screws through the wood into the steel or with 1/4" WS-Series screws through pre-drilled holes in the face of Panel. Pre-drilled holes must be evenly spaced no less than 3" OC

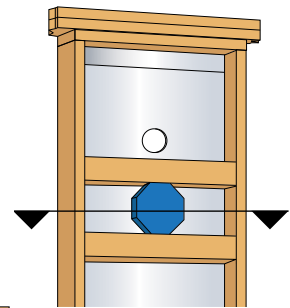


Cavity Face

Panel in 2x4 framing with cavity towards outside face of wall

2x6 Wall Framing

- Installation of Panels are recommended to be at the inside face of a 2x6 wall to increase the concrete edge distance at the hold down anchors and to provide a 2" recess that can be used to:
 - Provide flat stud backing for surface finishes
 - Provide a thermal break in cold weather climates
 - Install a fixture at one or both faces of the wall



Solid Face

Panel set flush to inside face of 2x6 wall



Wood

For attaching wood, siding, drywall and other surface finishes to the Panel or Brace Frame face #10 Flat or Wafer Head, self-tapping screws with a "Winged" self drilling (SD) point are recommended. When connecting to the edge of Panels, use a #12 diameter screw.



FLAT TRUSS



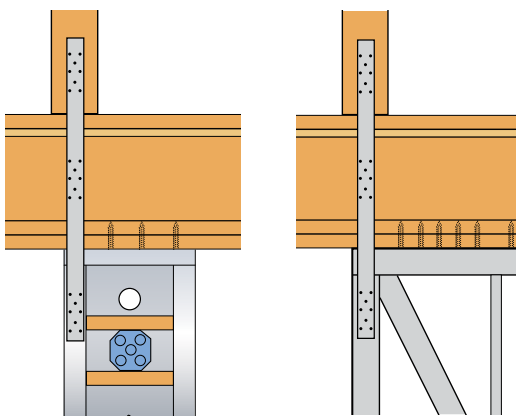
WAFER HEAD



WING TIP "SD" SELF TAPPING

Steel

When attaching steel connectors (12-gage maximum) fixtures, electrical boxes, wire mesh, etc. to the Panel or Brace Frame face #10 Hex, Flat Truss or Modified Truss Head with a Self Drilling (SD) point are recommended. When connecting to the edge of Panels, use a #12 diameter.



HEX HEAD



FLAT TRUSS



SELF DRILLING "SD" POINT SELF TAPPING

Additional Tools and Publications From Hardy Frame®



Typical Installation Detail Pages

Hardy Frame® provides our Typical Installation Details in plan format. These pages are available in ACAD, pdf, or you may request a hard copy directly from us. The pages are organized by bottom connections, top connections and installations involving floor systems. Any or all of these pages may be attached to your plans as supplemental pages or you can copy selected details as needed.

Installation Guide

The Hardy Frame® Installation Guide was written specifically for Suppliers and Installers. This publication provides all HFX model numbers, dimensions, bolt and screw patterns, connectors, installation illustrations, attachments with self-tapping screws and information regarding Template Kit (HFXTK) and Floor to Floor Connector Kit (HFTC) components.



Moment Frame Catalog

Includes instructions for designing with Hardy Frame® Moment Frames, allowable values, typical Installation details and a Non-Standard form for submittal when project conditions require a custom design.

Retrofit Pamphlet

Provides building owners with an introduction to construction techniques and MiTek Builder Products available to strengthen soft-story buildings in retrofit applications. The Hardy Frame Shear Wall System combined with USP Structural Connectors provides soft story solutions. This pamphlet can be used by the Design Professional to illustrate retrofit concepts to their clients.



Z4 Product Catalog

The Z4 product line, including the Cinch Nut, CT and T2, are now a part of the Hardy Frame family. The Cinch Nut is a self ratcheting device that is designed to maintain a tight connection in the Z4 continuous "Quick Connect" rod system. The Cinch Nut joins the CT and T2 to offer more design options than any other hold down system and are rated for Tension capacities that range from 5,000 to 60,000 lbs. In addition to continuous rod applications, the T2 can be used as a hold down in conventionally framed shear walls. info@zonefour.com

USP Structural Connectors Product Catalog

The 2015-2016 USP Catalog is a comprehensive 236 page guide to the United States product line. It features all new product and application illustrations, detailed installation instructions, fastening schedules and load ratings. EWP and Plated Truss connectors are included.



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