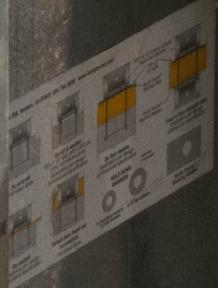


# INSTALLATION GUIDE



**MiTek**  
Better Technology. Better Building.

**MiTek**  
**HARDY FRAME**  
Shear Wall Systems

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**M**iTek® Hardy Frame® manufactures and markets the revolutionary MiTek® Hardy Frame® shear wall system, and has been the leader in the pre-fabricated shear wall industry for over 15 years. The MiTek® 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 MiTek® Hardy Frame® product line includes Panels, Brace Frames, Special Moment Frames, and various accessory items for complete 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 MiTek® 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.

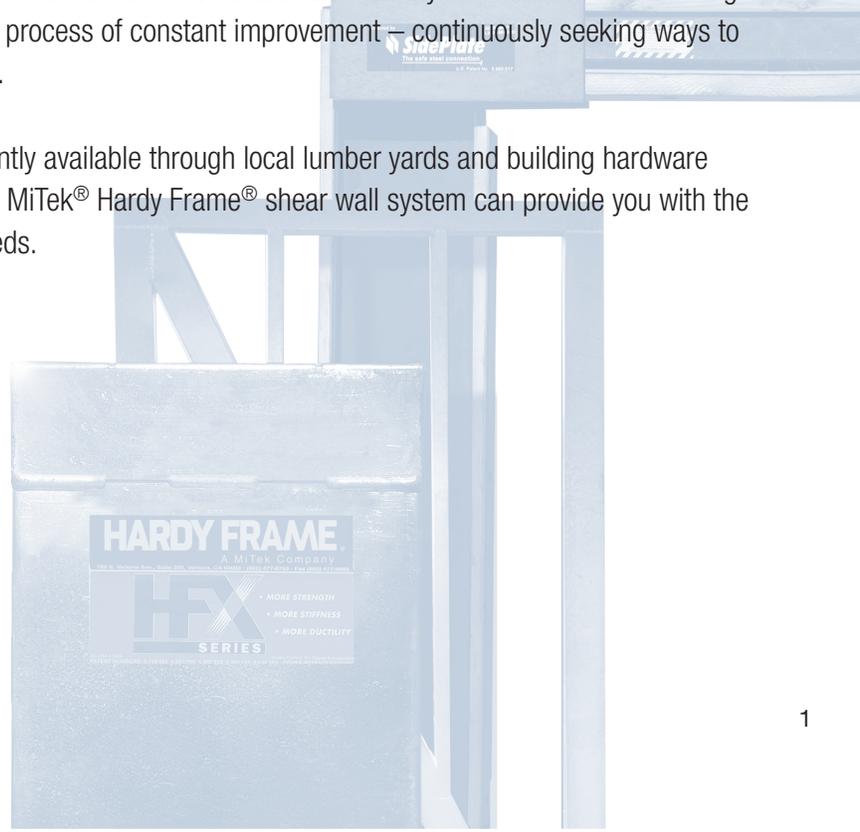
From its inception the MiTek® Hardy Frame® Shear Wall System has proven to be the leading innovator in it's category. In fact, the MiTek® Hardy Frame® was the first to be recognized by ICBO-ES and LA City, the first to gain approval for multi-story applications, the first Balloon Wall application, and 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.

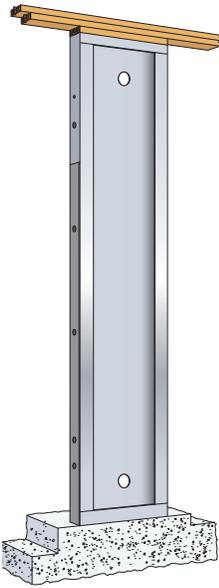
MiTek® Hardy Frame® is a wholly owned subsidiary of MiTek® USA, Inc., which is part of Warren Buffett's Berkshire Hathaway, Inc. By combining our talents with MiTek's manufacturing, engineering, and software expertise, we have amassed the resources to develop and offer the best products and services 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.

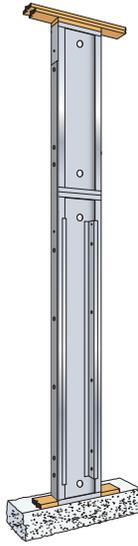
All of the MiTek® Hardy Frame® products are conveniently available through local lumber yards and building hardware suppliers. Please contact us today to discover how the MiTek® Hardy Frame® shear wall system can provide you with the Best Value solutions to your shear and wall bracing needs.

For more information, please call us at 800-754-3030 or visit our website at [www.hardyframe.com](http://www.hardyframe.com)



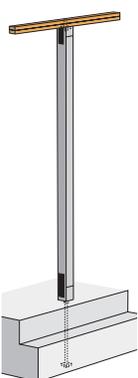
	HFX Model Number	W (in)	H (in)	Depth (in)	Wt (lbs)	Minimum Screw Qty @ Top (ea)	Minimum Screw Qty @ Bottom (ea)	Screw Holes Available @ Edges (ea)
 <p><b>Panel</b> 9 in. thru 24 in. widths</p>	HFX-9x79.5	9	79-1/2	3-1/2	77	5	NA	4
	HFX-12x78	12	78		90	6	6	
	HFX-15x78	15			101	8	8	
	HFX-18x78	18			113	10	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	10	NA	
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			

\* HFX/S models (not shown) are fabricated to standard steel stud heights of 96-5/8", 108-5/8" etc.



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)
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							

**Balloon Panel**  
15 in. thru 24 in widths  
14 ft. thru 20 ft. heights



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

**Post**

**Ordering Information**

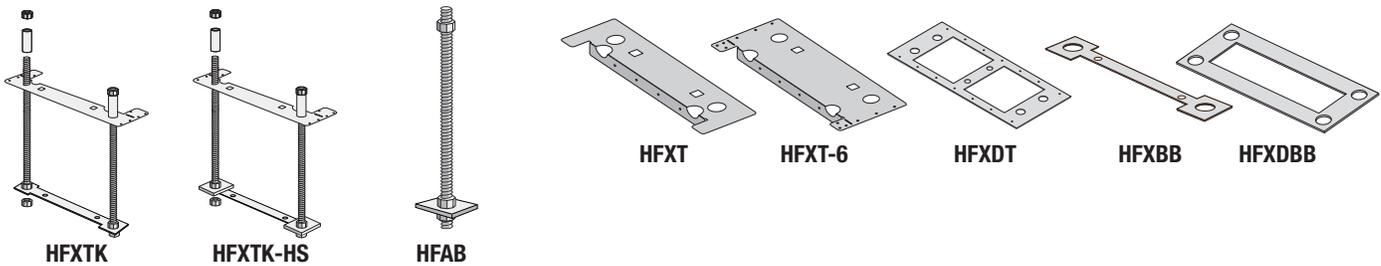
- 1) For Panels, adding "STK" after the model number indicates HFX Stacking Panels with built-in HFSW-Stacking Washers pre-welded inside the top channel.
- 2) HFX/S models (not shown) are fabricated to standard steel stud heights of 96-5/8", 108-5/8" etc.
- 3) Custom heights are available for Panels,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

**Connector Information**

- 1) Screws are 1/4-inch diameter USP-WS (ESR-2761) or equal
- 2) Screws at top are 3-inches when attaching directly to the collector. When installing a 2x wood filler at the top connection, the minimum screw length is 4-1/2 inches.
- 3) Screws at bottom (when applicable) are 4-1/2 inches at Panel and Brace Frame connections, 3-inches (minimum) at MiTek® Hardy Frame® Bearing Plate.
- 4) 1/4" diameter edge screws to adjacent framing are required when installing fillers above greater than 2-1/2" or when specified by the Building Design Professional.

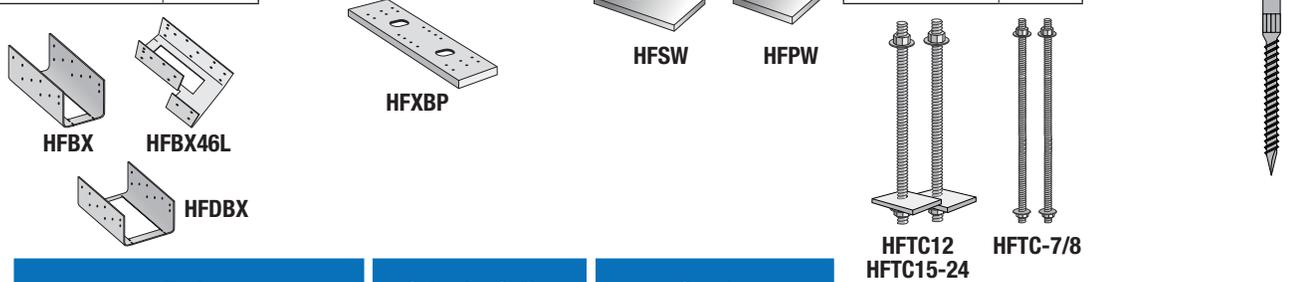
## Anchorage

Template Kits		Anchor Bolt Assemblies		Templates				Bolt Braces							
STD Rods <sup>1</sup>	Wt (lbs)	HS Rods <sup>2</sup>	Wt (lbs)	Panels <sup>1,2,3</sup>	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	HFBB9	0.3	HFDBB9	0.3
HFXTK12	20	HFXTK-HS12	26	HFAB1-1/8x48STD	13.5	HFXT12	0.9	HFXT12-6	1.2	HFXT12	2.2	HFBB12	0.4	HFDBB12	0.4
HFXTK15	21	HFXTK-HS15	26	HFAB1-1/8x60STD	16.3	HFXT15	1.2	HFXT15-6	1.5	HFXT15	2.5	HFBB15	0.5	HFDBB15	0.5
HFXTK18	21	HFXTK-HS18	27	HFAB1-1/8x72STD	18.9	HFXT18	1.4	HFXT18-6	1.7	HFXT18	2.8	HFBB18	0.6	HFDBB18	0.6
HFXTK21	21	HFXTK-HS21	27	HFAB1-1/8x36HS	10.8	HFXT21	1.7	HFXT21-6	1.0	HFXT21	3.3	HFBB21	0.7	HFDBB21	0.7
HFXTK24	22	HFXTK-HS24	28	HFAB1-1/8x48HS	13.5	HFXT24	1.9	HFXT24-6	1.2	HFXT24	3.8	HFBB24	0.8	HFDBB24	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				



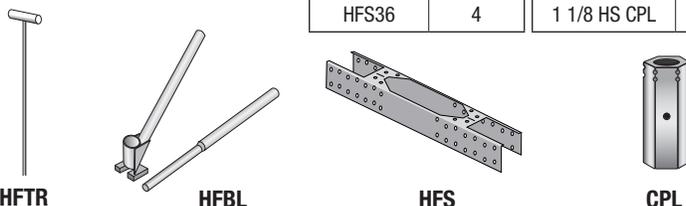
## Bottom and Top Connectors

Base Extensions		Bearing Plates & Stacking Washers			Tension Connector Kits		Shear Transfer			
HFBX	Wt (lbs)	Bearing Plates	Wt (lbs)	Stacking Washers <sup>4</sup> Plate Washers	Wt (lbs)	Rods <sup>1,2,4</sup>	Wt (lbs)	Pro-Series WS Screws	Size	Box Qty
HFBX	2	HFXPB12 (Length = 18")	13	HFSW12	1.5	HFTC12 STD	15	WS3-HF	1/4 x 3	30
HFBX46-L (Left)	2.5	HFXPB15 (Length = 21")	15	HFSW15-24	2.8	HFTC15-24 STD	20	WS45-HF	1/4 x 4 1/2	30
HFBX46-R (Right)	2.5	HFXPB18 (Length = 24")	17	HFPW 7/8	1	HFTC-7/8 STD	9			
HFBX66-L (Left)	3	HFXPB21 (Length = 27")	19	HFPW 1-1/8	1	HFTC12 HS	18			
HFBX66-R (Right)	3	HFXPB24 (Length = 30")	21			HFTC15-24 HS	21			
HFDBX	2.5					HFTC-7/8 HS	9			



Tools		Collector Splice		Coupler			
T-Rod	Wt (lbs)	Bolt Lever	Wt (lbs)	Saddles	Wt (lbs)	CPL	Wt (lbs)

HFTR	4	HFBL	21	HFS24	3	7/8 HS CPL	0.3
				HFS36	4	1 1/8 HS CPL	0.5

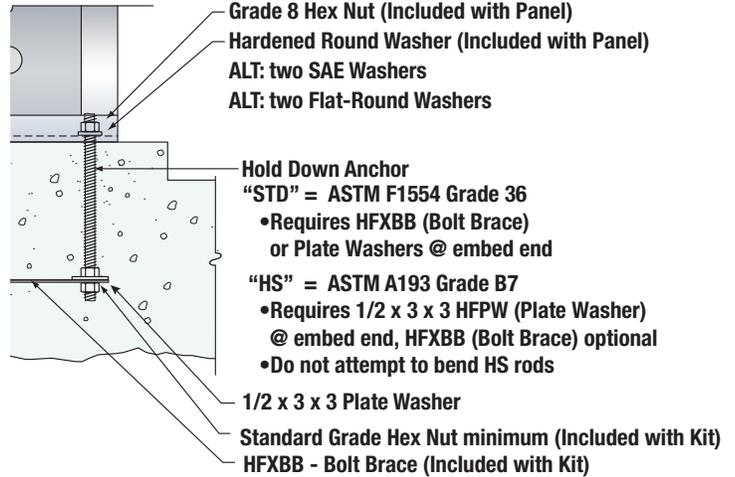
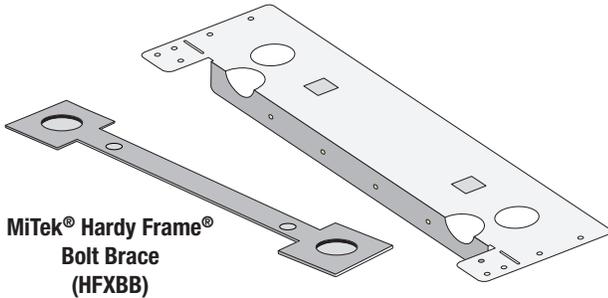


### Notes

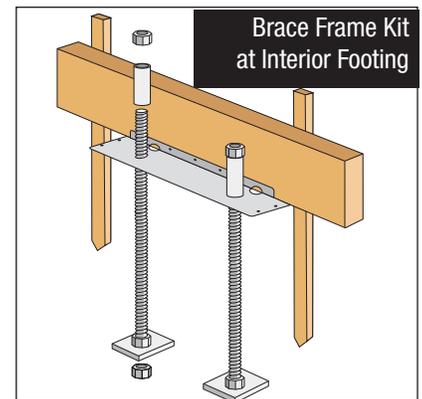
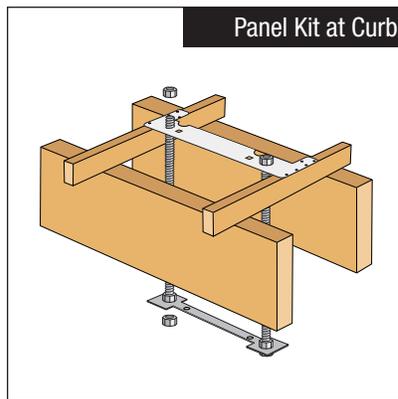
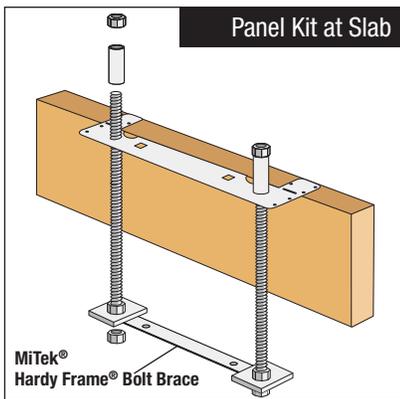
- 1) STD Anchor Bolts are ASTM F1554 Grade 36.
- 2) HS Anchor Bolts are ASTM A193 Grade B7 stamped on both ends.
- 3) HFAB anchor bolt assemblies also available in 7/8" diameter for Brace Frames.
- 4) HFSW12 and HFTC12 apply to 12 inch Panel widths. HFSW15-24 and HFTC15-24 apply to 15, 18, 21 and 24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

### MiTek® 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



### MiTek® Hardy Frame® HFX Template Kit (HFXTK)



#### MiTek® Hardy Frame® HFX Template Kit Components

Kit Model Number	Template (1 ea)	Bolt Brace (1 ea)	Panels		Brace Frames	
			Anchor Bolt 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	2

#### Anchor Bolt 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

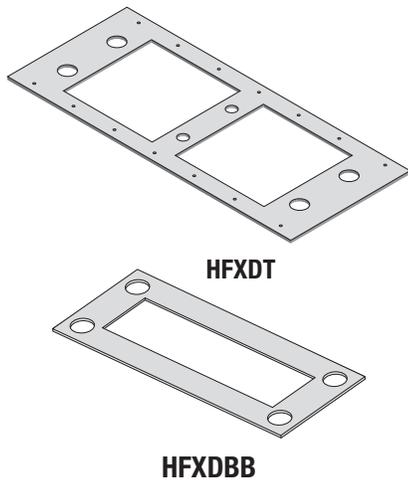
7/8 STD = 7/8 x 30" ASTM F1554 Grade-36 all thread with (1) 1/2x3x3 ASTM A36 Plate Washer & (3) Standard Hex Nuts

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 MiTek® 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 MiTek® Hardy Frame® Bolt Brace (Minimum) double nutted at the embed end or 1/2x3x3 ASTM A36 Plate Washer
- 4) HS assemblies require 1/2x3x3 ASTM A36 Plate Washer (HFPW) (Minimum) and the MiTek® Hardy Frame® Bolt Brace is optional
- 5) HS all thread rods provided by MiTek® Hardy Frame® are stamped on both ends



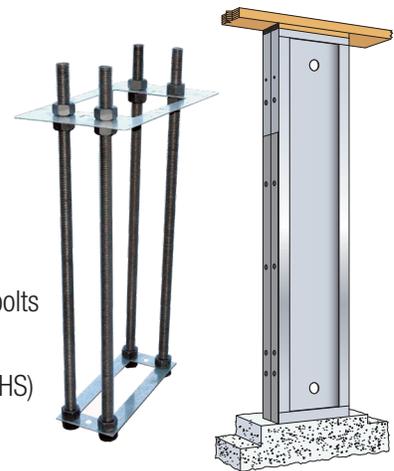


### Back-to-Back MiTek® Hardy Frame® HFX Double Template

- 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

MiTek® 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 MiTek® 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

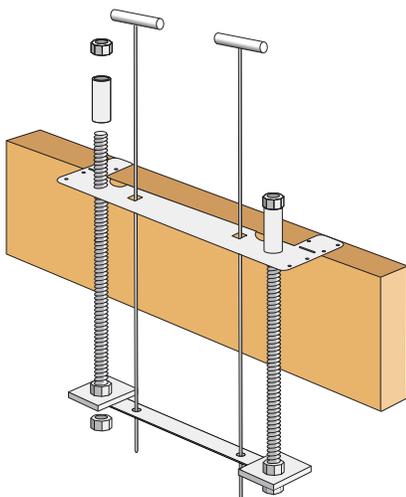
#### Brace Frames

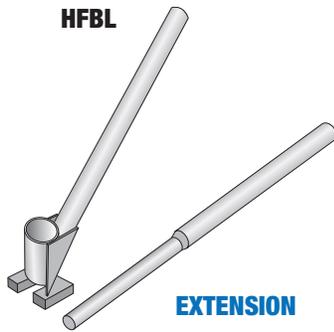
- 2 each HFAB7/8 (Specify length and STD or HS grade)
- 1 each HFXT Template

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

### MiTek® Hardy Frame® T-Rods (HFTR)

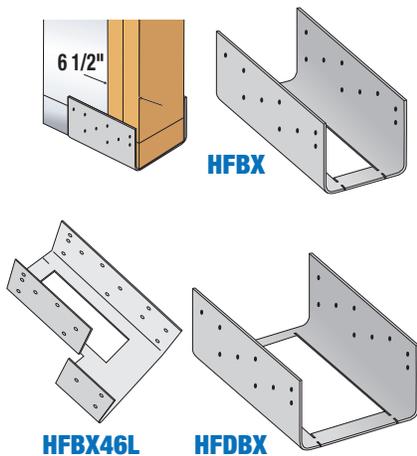
MiTek® Hardy Frame® T-Rods (HFTR) are used in combination with MiTek® Hardy Frame® Templates and Bolt Braces to position the embed end of hold down anchors prior to pouring concrete. T-Rods are 1/2 inch diameter, 5 feet long, pointed on one end with a handle provided on the other end. With the MiTek® 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.





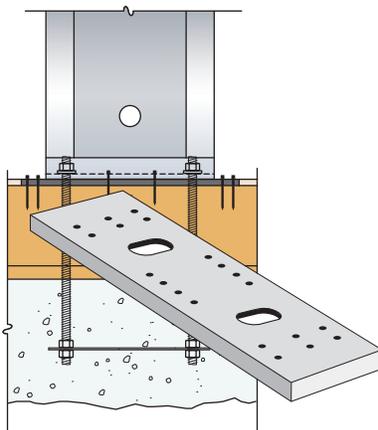
### MiTek® Hardy Frame® Bolt Lever (HFBL)

- 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**



### MiTek® Hardy Frame® Base Extension (HFBDX)

- Connects adjacent wood mudsill and stud (or post) to MiTek® Hardy Frame® Panel/Brace Frame
- Adjustable installation for HFBDX extends up to 6-1/2" beyond edge of Panel.
- Break-away tab allows installation after Panel/Frame has been set
- HFBDX for back-to-back Panel installations
- HFBDX46L (Left) and HFBDX46R (Right) connect to 4x6 members
- HFBDX66L (Left) and HFBDX66R (Right) connect to 6x6 members
- Left and Right configurations accommodate Panel installation flush to one face of 6" framing

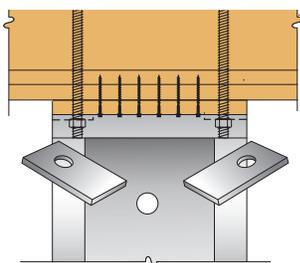


### MiTek® Hardy Frame® Bearing Plate (HFBDP)

#### For Installation with MiTek® Hardy Frame® Panels

- 3/4" thick x 3 1/2" wide ASTM A36 steel
- Model number corresponds to Panel width, HFBDP 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 HFBDP. Installation without a HFBDP may result in a reduction of allowable loads**

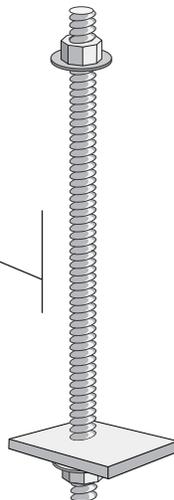
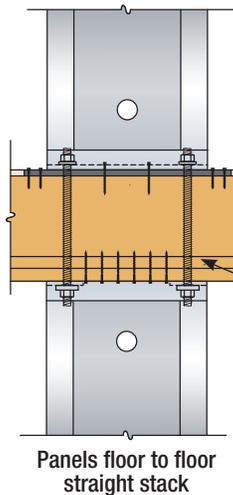


### MiTek® Hardy Frame® Stacking Washer (HFBSW)

- MiTek® Hardy Frame® Stacking Washers (HFBSW) are required in the top of Panels when connecting to a hold down rod from above.
- MiTek® 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)
- HFBSW12 measures 2-3/4" x 3" for installation in HFX-12x Panels
- HFBSW15-24 measures 2-3/4" x 5" for installation in HFX-15x through HFX-24x Panels

## MiTek® Hardy Frame® Tension Connectors

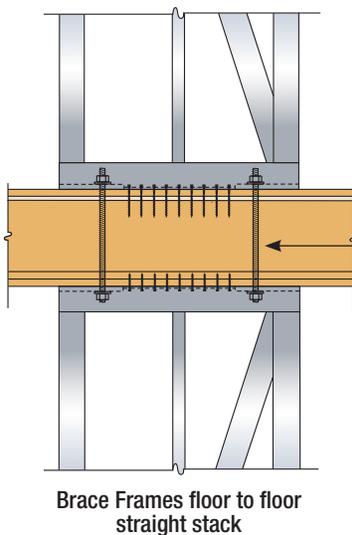
\*For joist depths up to 14"



- MiTek® Hardy Frame® Stacking Washers (HFSW) 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
- MiTek® Hardy Frame® TENSION CONNECTORS



### HFTC15-24 STD

- ROD GRADE
- 15 in. THROUGH 24 in. PANEL WIDTHS
- MiTek® Hardy Frame® TENSION CONNECTORS

### HFTC-7/8 STD

- ROD GRADE
- ROD DIAMETER (FOR BRACE FRAMES)
- MiTek® Hardy Frame® TENSION CONNECTORS

### MiTek® Hardy Frame® Tension Connector Kit Components

Tension Kit Model Number	HFSW Stacking Washer (2 per kit)	Panels		Brace Frames	
		Hold Down Anchor Assembly			
		1-1/8 STD	1-1/8 HS	7/8 STD	7/8 HS
HFTC12-STD	HFSW12	2			
HFTC12-HS	HFSW12		2		
HFTC15-24 STD	HFSW15-24	2			
HFTC15-24 HS	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) MiTek® Hardy Frame® HFSW Stacking Washers are required in the top channel of Panels when connecting to a hold down anchor 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 MiTek® Hardy Frame are stamped on both ends



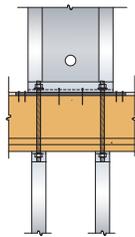
## MiTek® Hardy Frame® Post

The MiTek® Hardy Frame® HFP and HFP/S Post are 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.

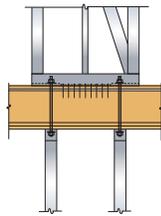
Tables provide tensile values for standard grade (STD) and for High Strength (HS) hold down rods. Be sure to include the embed callout on the foundation plan

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

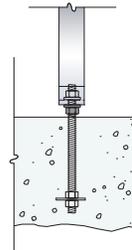
All Posts are 3 1/2" x 3 1/2" square and are fabricated from 12 gage steel. Custom heights up to the maximum listed in the table are available.



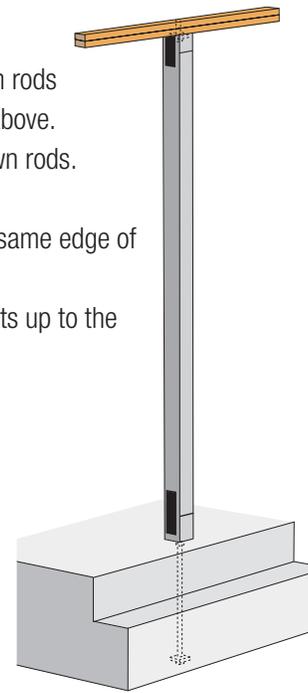
MiTek® Hardy Frame® Panel to two MiTek® Hardy Frame® Posts below



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



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



Model Number	Net Height (in)	HD Dia (in)	Allowable Compression <sup>3,4,5</sup> (lbs)	STD Allowable Tension <sup>6</sup> (lbs)	HS Allowable Tension <sup>6</sup> (lbs)
<b>HFP</b>					
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
<b>HFP/S</b>					
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

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

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 ( $\Omega$ ) 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.

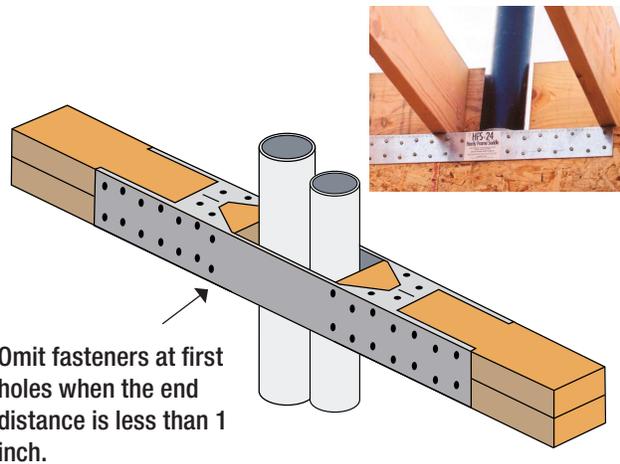
4) For installation on supporting materials other than noted above, the Design Professional must check the Bearing Stress based on the Post bearing area of 12.25 square inches.

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.

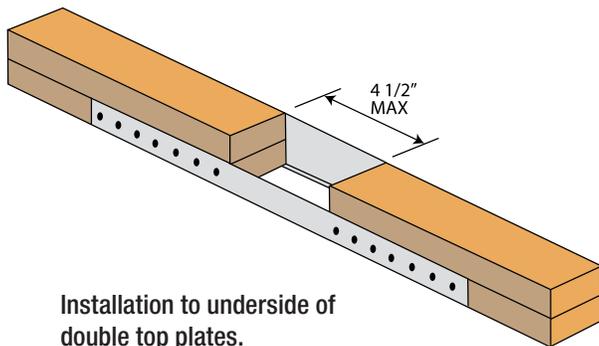
6) STD indicates bolts complying with ASTM F1554 Grade 36. HS rods include, but are not limited to ASTM F1554 Grade 105, ASTM A193 Grade B7 or ASTM A354 Grade BD.

## MiTek® Hardy Frame® Saddle

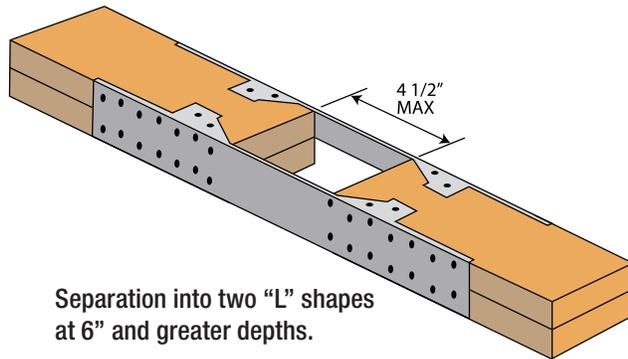
The MiTek® Hardy Frame® Saddle (HFS) is a 14 gauge steel channel intended to be used as a splice at locations where plumbing or other vertical penetrations destroy the structural integrity of a wall's top plates. The Saddle can be installed over the top or from the underside of the top plates, and is capable of resisting both tension and compression loads in a clearspan of up to 4-½" inches. For wall depths greater than 3-½", 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.



Omit fasteners at first holes when the end distance is less than 1 inch.



Installation to underside of double top plates.



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

MiTek® Hardy Frame® Saddle <sup>1,2</sup>			
Model Number	Fastener Quantity <sup>3,4</sup>	Allowable Tension <sup>5,6</sup> (lbs)	Allowable Compression (lbs)
HFS24	24-16d common	2950	2500
HFS36	32-16d common	4280	2500

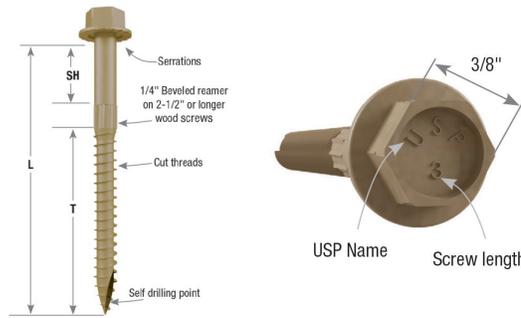
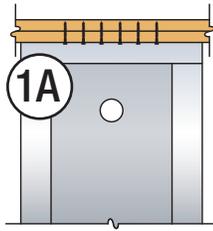
For SI 1 inch = 25.4 mm, 1 lb. = 4.45 N

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

## MiTek® Pro-Series™ Screws for use with MiTek® Hardy Frame® Panels

### WS-1/4" x 3" Screws

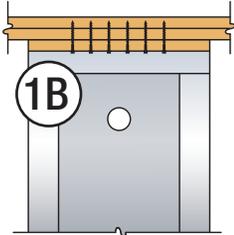
For connection directly to top plates



MiTek® PRO SERIES™

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

For 2x filler above

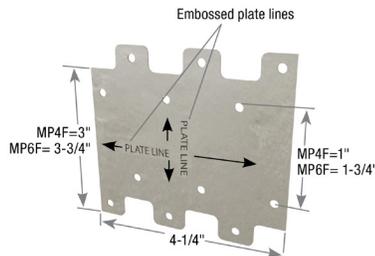
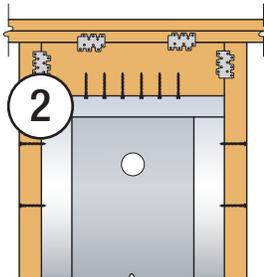


USP Stock No.	Description	Dimensions (in)				Finish	Allowable Shear (160%)	
		L	SH	T	Thread		12 GA Steel to DF-L/SP	12 GA Steel to S-P-F
WS3	1/4" x 3"	3	3/4	2-1/4	2	Zinc	668 lbs	475 lbs
WS45	1/4" x 4-1/2"	4-1/2	1-1/4	3-1/4	3	Zinc	825 lbs	673 lbs

1. Allowable loads have been increased 60% for short term loading; 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

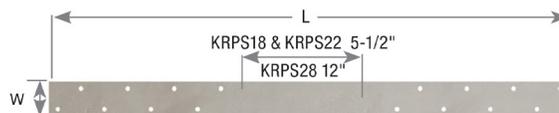
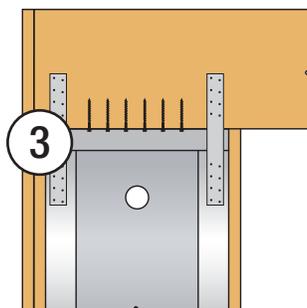


USP Stock No.	Steel Gauge	Orientation	Fastener Schedule		Direction of Load	Allowable Shear (160%)	
			Each Member			DF-L/SP	S-P-F
			Qty	Type			
MP4F	20	H	6	8d x 1-1/2	H	845 lbs	710 lbs

1. Allowable loads have been increased 60% for short term loading; 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

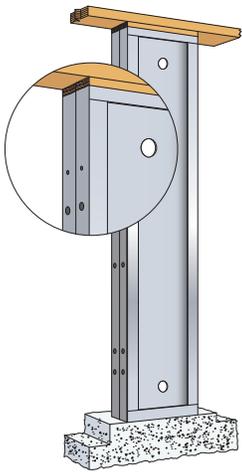
For Portal condition with #10 self-tapping screws to Panel and 16d nails to header



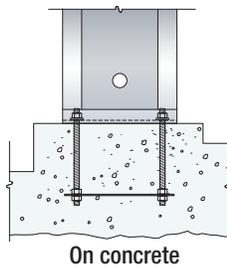
USP Stock No.	Steel Gauge	Dimensions (in)		Fastener Schedule		Allowable Tension (160%) DF-L/SP
		W	L	#10 Screws	16d Nails	
KRPS18	16	1-1/2	18-5/16	6	6	1325 lbs
KRPS22			22-5/16	8	8	1720 lbs
KRPS28			28-5/16			

1. Allowable loads have been increased 60% for short term loading; 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.

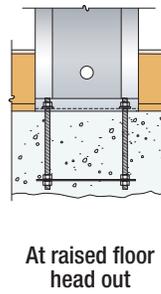




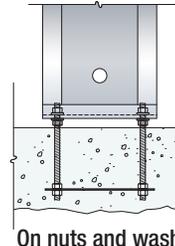
**"Back to Back"**  
installations provide two times  
the allowable shear value



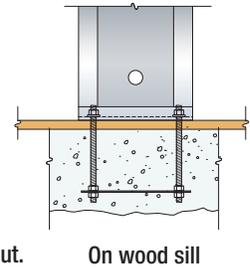
On concrete



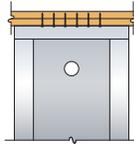
At raised floor  
head out



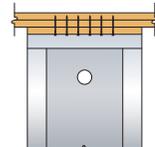
On nuts and washers  
(Requires 5,000 psi non-shrink grout.  
Check with building jurisdiction for  
3rd party inspection requirements)



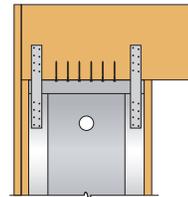
On wood sill



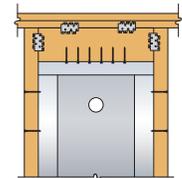
Connection to  
top plates  
1/4 x 3" WS-Series  
screws



With 2x filler  
1/4 x 4 1/2" WS-Series  
screws



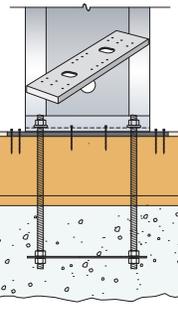
Portal condition 1/4 x 3" WS-Series  
screws and USP KRPS straps  
(when required by design professional).  
Use #10 self tapping screws to Panel  
and 16d nails to header. Note: 78"  
heights include welded straps



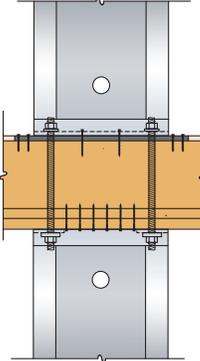
With 4x filler  
1/4 x 3" WS-Series screws and  
MP4 F Connectors (qty  
by design professional)



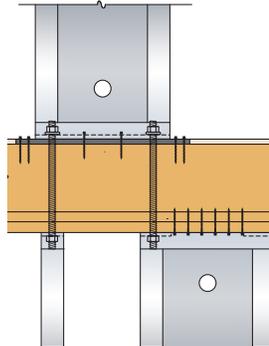
**HFBX**  
Base Extension  
attachment for  
adjacent framing extends  
up to 6 1/2" beyond face of  
Panel



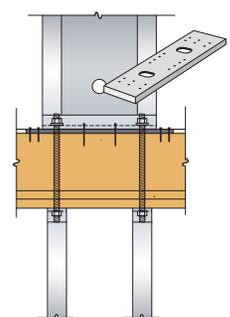
On raised floor  
1/4 x 4 1/2" WS-Series  
screws



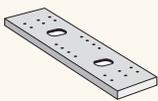
Straight-Stack installation  
requires Stacking Washers  
in the top channel of the  
lower Panel. Note: "STK  
Panels" include welded washers



Stagger-Stack installation  
requires a Stacking Washer  
in the top channel of the  
lower Panel. Note: "STK  
Panels" include welded  
washers

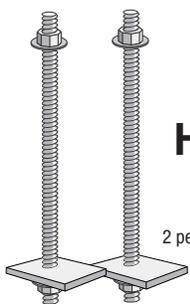


Two MiTek® Hardy Frame®  
Posts below



**HFXBP Bearing Plate**  
Install below Panel directly  
on Rim. Extends 3"  
beyond edge of Panel

**Floor to Floor connectors**



**HFTC**

2 per kit

**MiTek® Hardy Frame®  
Tension Connector Kit Components**

Tension Kit Model Number	"HFSW" Stacking Washer (2 each included)	Panels	
		Connector Rod Assembly	
		1-1/8 STD	1-1/8 HS
HFTC12 STD	HFSW12	2	
HFTC12 HS	HFSW12		2
HFTC15-24 STD	HFSW15-24	2	
HFTC15-24 HS	HFSW15-24		2

**Connector Rod Assemblies:**

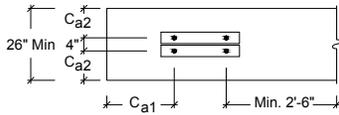
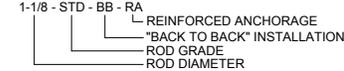
- HFTC-1 1/8 STD = 1-1/8 x 26" ASTM F1554 Grade-36 all thread with (2) Hardened Round Washers (1 "HFSW" Washer & (2) Grade 8 Hex Nuts.
- HFTC-1 1/8 HS = 1-1/8 x 26" ASTM A193 Grade-B7 all thread with (2) Hardened Round Washers (1 HFSW Washer & (2) Grade 8 Hex Nuts.
- 1) MiTek® Hardy Frame® "HFSW" washers for stacking 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 plates
- 3) Each Hardened Round Washer may be substituted with two SAE or two Round-Flat Washers
- 4) HS all thread rods provided by MiTek® Hardy Frame®s are stamped on both ends



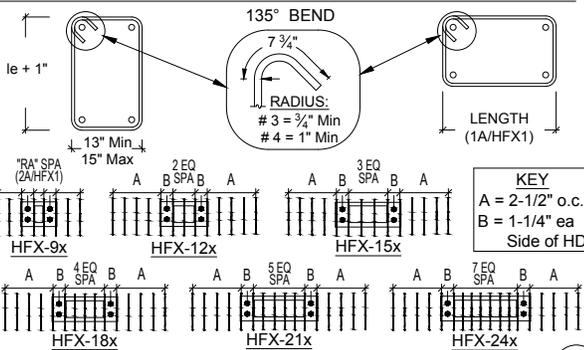
BACK TO BACK REINFORCED ANCHORAGE (BB-RA)

Model	Panel Width (in)	Anchorage <sup>1</sup>	Rod Dia (in)	Rod <sup>2,3</sup> Grade	BB-RA		Stirrups <sup>9</sup> (in)	Shear <sup>7</sup> Ties
					le <sup>4</sup> (in)	Ca <sup>5</sup> (in)		
HFX-9x	9	1-1/8-STD-BB-RA	1-1/8	STD	15	19-3/4	8 - #4	#3 (min) @ 3-3/4" OC
HFX-12x	12	1-1/8-STD-BB-RA 1-1/8-HS-BB-RA						
HFX-15x	15	1-1/8-STD-BB-RA 1-1/8-HS-BB-RA	1-1/8	STD HS	23	11	14 - #4	#3 (min) @ 4" OC
HFX-18x	18	1-1/8-STD-BB-RA 1-1/8-HS-BB-RA						
HFX-21x	21	1-1/8-STD-BB-RA 1-1/8-HS-BB-RA	1-1/8	STD HS	20-5/8	11	15 - #4 16 - #4	#4 (min) @ 4" OC
HFX-24x	24	1-1/8-STD-BB-RA 1-1/8-HS-BB-RA						

BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE

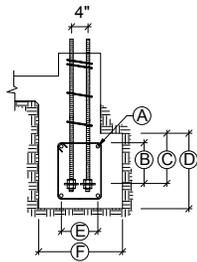


3

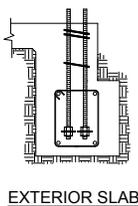


BB-RA SHEAR TIES & STIRRUPS

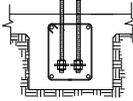
3A



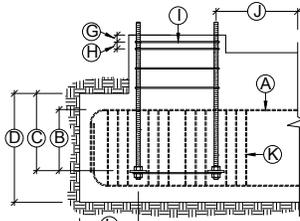
CURB (12" MIN WIDTH)



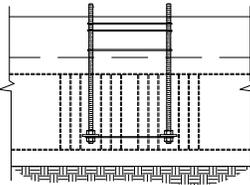
EXTERIOR SLAB



INTERIOR SLAB



CURB @ OUTSIDE CORNER



CONTINUOUS FOOTING

BB-RA SECTIONS & ELEVATIONS

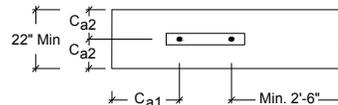
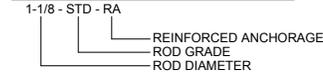
3B

- A. #4 (Min) Longitudinal 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

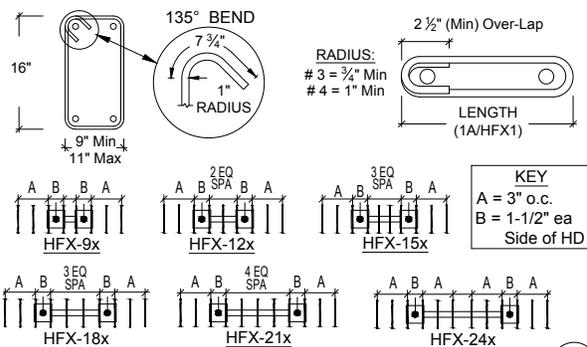
REINFORCED ANCHORAGE (RA)

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

REINFORCED ANCHORAGE NOMENCLATURE

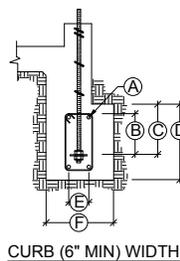


2

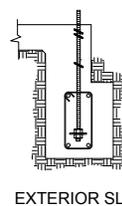


RA SHEAR TIES & STIRRUPS

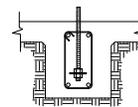
2A



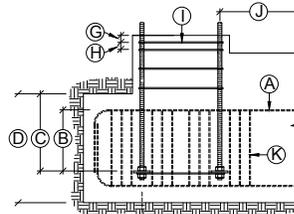
CURB (6" MIN WIDTH)



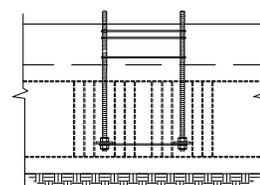
EXTERIOR SLAB



INTERIOR SLAB



CURB @ OUTSIDE CORNER



CONTINUOUS FOOTING

RA SECTIONS & ELEVATIONS

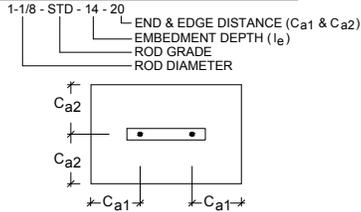
2B

- A. #4 (Min) Longitudinal 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

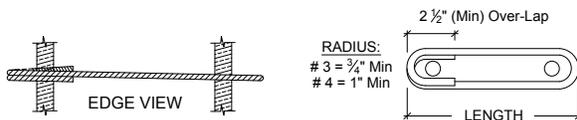
**UNREINFORCED ANCHORAGE (UA)**

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

**UNREINFORCED ANCHORAGE NOMENCLATURE**



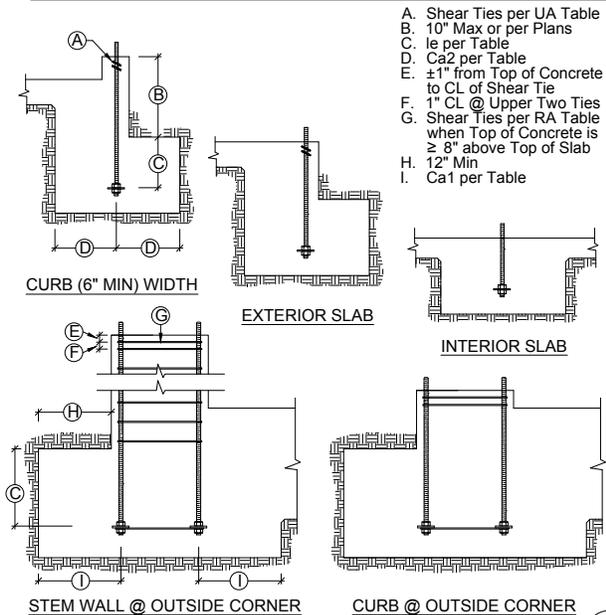
1



Model	Length	End Distance $\geq$	Edge Distance $\geq$
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

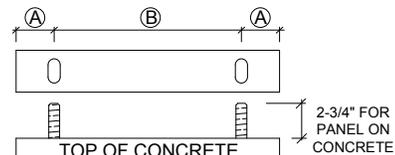


UA SECTIONS & ELEVATIONS

1B

- A. Shear Ties per UA Table
- B. 10" Max or per Plans
- C. l<sub>e</sub> per Table
- D. Ca<sub>2</sub> 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. Ca<sub>1</sub> per Table

- DESIGNS ARE TO RESIST LOADING PER ACI 318-14, SEC 17.2.3.4.3.
- STD INDICATES ANCHORS COMPLYING WITH ASTM F1554 GRADE 36 WITH A HARDY FRAME BOLT BRACE (HFXBB) INSTALLED WITH STD OR GRADE 8 DOUBLE NUTS ON THE EMBED END.
- HS INDICATES ANCHORS COMPLYING WITH ASTM A193 GRADE B7 WITH A 1/2"x3"(MIN) HFPW PLATE WASHER INSTALLED WITH DOUBLE NUTS ON THE EMBED END (HFXBB NOT REQUIRED).
- LE = LENGTH OF EMBEDMENT FROM THE TOP OF FOOTING OR GRADE BEAM TO THE TOP OF THE HFXBB BOLT BRACE (TOP OF THE EMBEDDED HFPW 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 AND REQUIRED FOR NEAR EDGE DISTANCE CONDITIONS PER ACI-318-14, F<sub>C</sub> = 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, ADDITIONAL TIES MAY BE REQUIRED AT STEM WALLS. SHEAR TIES ARE NOT REQUIRED FOR INSTALLATION AWAY FROM 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 318-14, SECTION 17.7.2. COATED REINFORCEMENT MAY BE SPECIFIED BY THE EOR TO LIMIT EXPOSURE AND THEREFORE REDUCE MINIMUM CONCRETE COVER. COATED REINFORCEMENT MUST COMPLY WITH ACI 318-14, SECTION 20.6.2.



Model	Width	(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 WITH DOUBLE-NUTS INSTALLED AT EMBED END OF STANDARD GRADE ANCHOR RODS. (NOTE: 1/2" x 3" x 3" MIN. HFPW 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

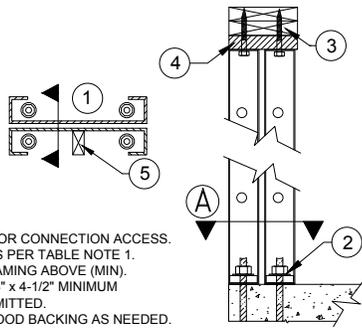
555 S. Promenade Ave., Suite 104, Corona, CA 92879  
(805) 477-0793 / www.hardyframe.com

MiTek

DATE:  
1-1-2020

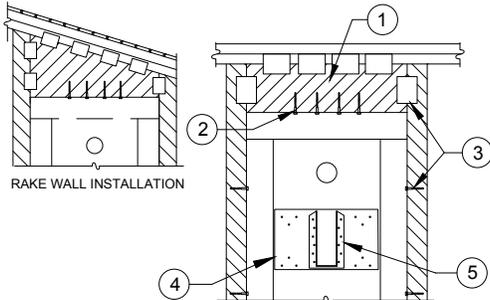
HFX1

SECTION A



1. CAVITY ORIENTED FOR CONNECTION ACCESS.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. NOMINAL 8 INCH FRAMING ABOVE (MIN).
4. A 2x FILLER WITH 1/4" x 4-1/2" MINIMUM WS SCREWS IS PERMITTED.
5. FIELD INSTALLED WOOD BACKING AS NEEDED.

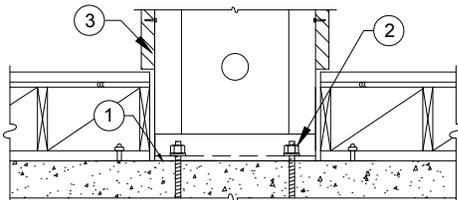
BACK TO BACK INSTALLATION ③



RAKE WALL INSTALLATION

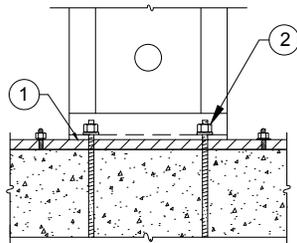
1. WOOD FILLER WITH USP MP4F CONNECTORS BOTH SIDES, QUANTITY BY BUILDING DESIGN PROFESSIONAL.
2. 1/4" x 3" (MINIMUM) WS SCREWS. QUANTITY PER TABLES
3. ADJACENT FRAMING WITH 1/4" DIAMETER SCREWS INSTALLED THROUGH PRE-PUNCHED HOLES IN PANEL EDGES REQUIRED WHEN INSTALLING A FILLER GREATER THAN 1-1/2" ABOVE TO BRACE OUT-OF-PLANE HINGE OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.
4. PRE-DRILL 3/16" DIA. HOLES, EVENLY SPACED IN FACE OF PANEL NO LESS THAN 2-1/4" OC AND INSTALL 1/4" DIA. WOOD SCREWS INTO 2x (MIN.) WOOD "LEDGER" IN PANEL CAVITY.
5. CONNECTOR AND ATTACHMENT BY BUILDING DESIGN PROFESSIONAL.

FILLER GREATER THAN 1-1/2 IN. ⑥



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. ADJACENT FRAMING WITH 1/4" DIAMETER SCREWS INSTALLED AT THE PANEL EDGES WHEN INSTALLING A FILLER GREATER THAN 1-1/2" ABOVE OR WHEN SPECIFIED BY DESIGN PROFESSIONAL.

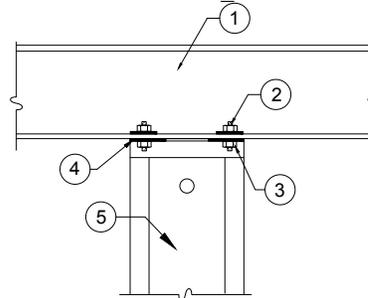
RAISED FLOOR HEAD-OUT ⑧



ALLOWABLE VALUES ON 2x PLATE ARE LESS THAN INSTALLATION ON CONCRETE

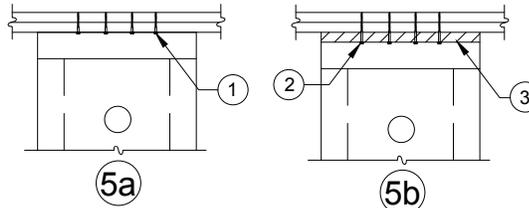
1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND TREATED PLATE.
2. NUTS AND WASHERS PER TABLE NOTE 1.

INSTALLATION ON 2x PLATE ⑪



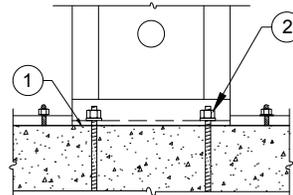
1. STEEL BEAM PER PLANS
2. ALL THREAD RODS THRU-BOLTED TO STEEL BEAM BY BUILDING DESIGN PROFESSIONAL.
3. NUTS AND WASHERS PER TABLE NOTE 1.
4. HARDY FRAME STACKING WASHERS (HFSW) REQUIRED TO BE WELDED INSIDE TOP CHANNEL OF LOWER PANEL.
5. HARDY FRAME STK PANEL WITH STACKING WASHERS WELDED INSIDE THE TOP CHANNEL BY MANUFACTURER.

STEEL BEAM ABOVE THRU-BOLT ②



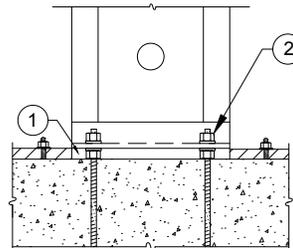
1. 1/4" x 3" (MINIMUM) WS SCREWS, QUANTITY PER TABLES
2. 1/4" x 4-1/2" (MINIMUM) WS SCREWS, QUANTITY PER TABLES
3. 2x WOOD FILLER.

TOP PLATE CONNECTIONS ⑤



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. NUTS AND WASHERS PER TABLE NOTE 1.

INSTALLATION ON CONCRETE ⑦

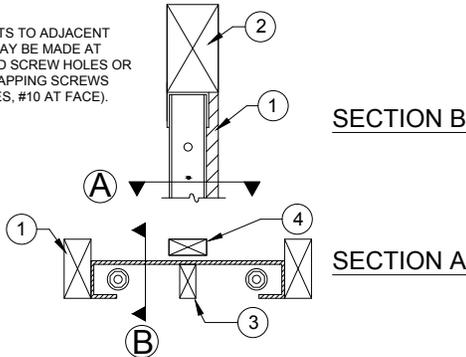


ALLOWABLE VALUES ON N&W ARE LESS THAN INSTALLATION ON CONCRETE

1. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH 5,000 PSI NON-SHRINK GROUT (MINIMUM).
2. NUT AND WASHER GRADES PER TABLE NOTE 1.

INSTALLATION ON NUTS & WASHERS ⑩

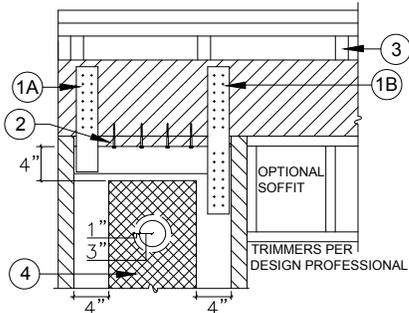
**NOTE:**  
ATTACHMENTS TO ADJACENT TRIMMERS MAY BE MADE AT PREPUNCHED SCREW HOLES OR WITH SELF TAPPING SCREWS (#12 AT EDGES, #10 AT FACE).



1. TRIMMERS PROVIDE FULL BEARING FOR HEADER ABOVE, DESIGN AND CONNECTIONS BY BUILDING DESIGN PROFESSIONAL.
2. 6x HEADER.
3. WOOD MEMBERS FOR BACKING MAY BE INSERTED VERTICALLY OR HORIZONTALLY IN THE PANEL CAVITY AS NEEDED.
4. WOOD MEMBER FLUSH TO FACE OF WALL FOR BACKING AS NEEDED.

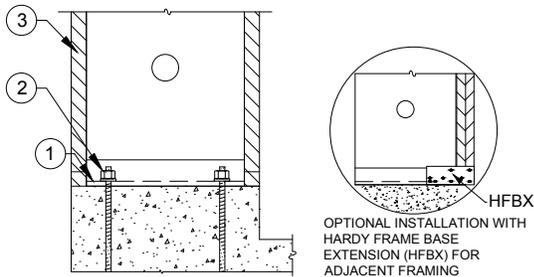
**6x HEADER ABOVE-SECTIONS** ①

**NOTE:**  
TO PREVENT DRILLING ADDITIONAL HOLES ORIENT THE PANEL CAVITY TOWARD THE FIXTURE BEING INSTALLED.



1. (A) PRE-WELDED STRAPS ARE PROVIDED ON 78" AND 79-1/2" PANEL HEIGHTS. THEY ARE AVAILABLE FOR OTHER HEIGHTS UPON REQUEST. (B) FIELD INSTALLED STRAPS WITH SELF TAPPING SCREWS ARE PERMITTED. THE DESIGN AND CONNECTION IS BY THE DESIGN PROFESSIONAL.
2. A 2x WOOD FILLER WITH 1/4"x4-1/2" (MIN.) WS SCREWS IS PERMITTED.
3. WHEN CRIPPLE STUDS OCCUR, SHEAR TRANSFER DESIGN TO BE PER THE BUILDING DESIGN PROFESSIONAL.
4. 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" MINIMUM FROM ANY EDGE. FOR PANELS MORE THAN 12" WIDE, ADDITIONAL HOLES MUST BE OFFSET 1" MINIMUM FROM THE 3" DIA. PREPUNCHED HOLE. FOR HOLES LARGER THAN 1" DIAMETER OR TO ADD MORE THAN ONE HOLE CONTACT MI TEK HARDY FRAME TECHNICAL SUPPORT AT (800) 754-3030.

**TOP CONNECTION TO HEADER** ④



1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. ADJACENT FRAMING OPTIONAL U.N.O. BY BUILDING DESIGN PROFESSIONAL.

**INSTALLATION ON CURB** ⑨

**HFX PANELS 78 IN. THROUGH NOMINAL 13 FEET**

Model Number	Net Height (in)	Depth (in)	Hold Down Diameter <sup>1</sup> (in)	Top Screw Qty <sup>2</sup> (ea)	Screw Qty Available at Edges (ea) <sup>3</sup>
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	
HFX-12,15,18,21 & 24x10	116-1/4			24" Width = 14	
HFX-15,18,21 & 24x11	128-1/4				
HFX-15,18,21 & 24x12	140-1/4				
HFX-15,18,21 & 24x13	152-1/4				

**BALLOON PANELS 14 FEET THROUGH 20 FEET**

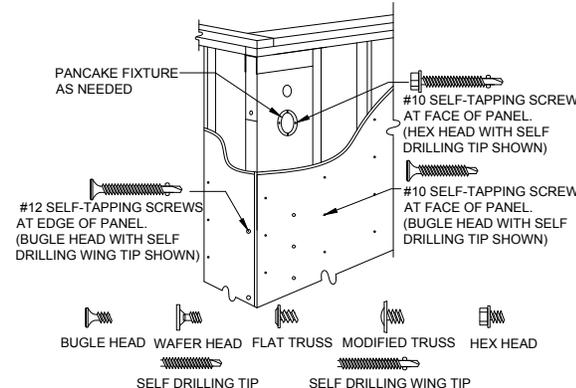
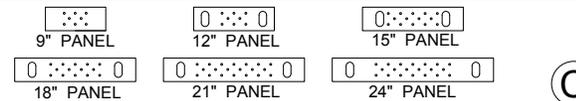
Model Number	Net Height (in)	Depth (in)	Hold Down Diameter <sup>1</sup> (in)	Top Screw Qty <sup>2</sup> (ea)	Screw Qty Available at Edges (ea) <sup>3</sup>
HFX-15,18,21 & 24x14	164-1/4	3-1/2	1-1/8	15" Width = 8	6
HFX-15,18,21 & 24x15	176-1/4			18" Width = 10	
HFX-15,18,21 & 24x16	188-1/4			21" Width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

**TABLE NOTES**

1. FOR STD OR HS GRADE HOLD DOWN ANCHOR BOLTS CONNECT TO THE PANEL BASE WITH HARDENED ROUND WASHERS BELOW GRADE 8 NUTS. ALTERNATE WASHERS ARE (2 EA) ROUND-FLAT OR (2 EA) SAE WASHERS ON EACH BOLT. ALTERNATE NUTS ARE 2H HEAVY HEX.
2. 1/4" DIAMETER MI TEK "PRO SERIES" WS SCREWS. 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 PANEL EDGES WHEN INSTALLING A FILLER ABOVE THE TOP CHANNEL THAT IS GREATER THAN 1-1/2" OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.

**INSTALLATION INSTRUCTIONS**

1. WHEN INSTALLING ON CONCRETE CONNECT WITH (1 EA) HARDENED ROUND WASHER BELOW (1 EA) GRADE 8 NUT, SECURE WITH A DEEP SOCKET (RECOMMENDED) UNTIL SNUG TIGHT. ALTERNATE WASHERS AND NUTS ARE PROVIDED IN TABLE NOTE 1.
2. INSTALLATION ON CONCRETE PROVIDES THE HIGHEST ALLOWABLE VALUES. CONFIRM WITH THE DESIGN PROFESSIONAL BEFORE INSTALLING ON OTHER SUPPORTING SURFACES.
3. USE 1/4"x4-1/2" MI TEK PRO SERIES WS SCREWS 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" (MIN) FILLER.
4. FOR INSTALLATIONS WITH A FILLER GREATER THAN 1-1/2" ABOVE, OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL, ADJACENT KING POSTS TO BRACE THE OUT-OF-PLANE HINGE CAN BE CONNECTED WITH 1/4" DIA. SCREWS THROUGH PRE-PUNCHED HOLES AT THE PANEL EDGES.



**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 GAUGE.

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  
 555 S. Promenade Ave., Suite 104, Corona, CA 92879  
 (805) 477-0793 / www.hardyframe.com

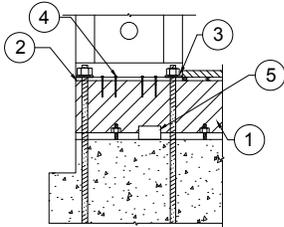
**MiTek**

DATE:  
1-1-2020

**HFX2**

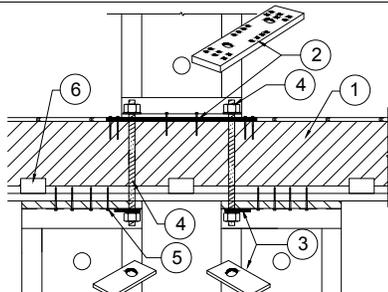
**NOTES:**

- A. INSTALLATION WITHOUT *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) MAY INCREASE DEFLECTION AND RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUE. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS
- B. COUPLERS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



- 1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> PANEL DIRECTLY ON RIM.
- 3. NUTS AND WASHERS PER TABLE NOTE 1.
- 4. 1/4" x 4-1/2" (MINIMUM) WS SCREWS THROUGH BOTTOM OF PANEL MINIMUM QUANTITY PER TABLE.
- 5. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

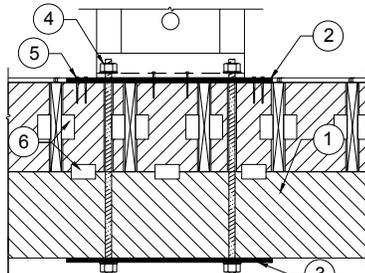
**RAISED-OS CORNER 4**



- 1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
- 3. *HARDY FRAME*<sup>®</sup> STACKING WASHER (HFSW) AT TOP OF PANEL REQUIRED WHEN CONNECTING TO TENSION ANCHOR FROM ABOVE.
- 4. 1-1/8 IN. DIA HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN *HARDY FRAME*<sup>®</sup> HFTC KIT.
- 5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
- 6. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**PYRAMID STACK 8**

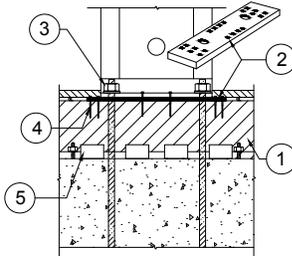
LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.



- 1. DROP BEAM WITH FLOOR JOIST ABOVE PER PLAN.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
- 3. *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) OR BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM TENSION ANCHOR FORCES.
- 4. NUTS AND WASHERS PER TABLE NOTE 1.
- 5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
- 6. USP CONNECTORS BY DESIGN PROFESSIONAL

**DROP BM - FL SYSTEM 14**

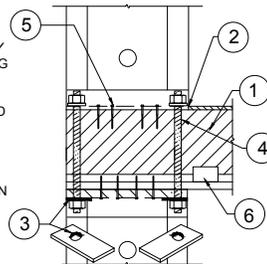
**NOTE:**  
COUPLERS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



- 1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
- 3. NUTS AND WASHERS PER TABLE NOTE 1.
- 4. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
- 5. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**RAISED BEARING PLATE 3**

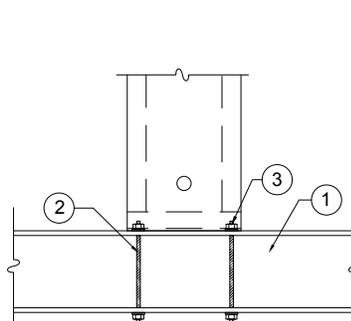
**NOTE:**  
INSTALLATION WITHOUT *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) MAY INCREASE DEFLECTION AND RESULT IN A DECREASE OF ALLOWABLE SHEAR VALUE. BUILDING DESIGN PROFESSIONAL MUST ANALYZE EFFECTS.



- 1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> PANEL DIRECTLY ON RIM.
- 3. *HARDY FRAME*<sup>®</sup> STACKING WASHER (HFSW) AT TOP OF PANEL REQUIRED WHEN CONNECTING TO TENSION ANCHOR FROM ABOVE.
- 4. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN *HARDY FRAME*<sup>®</sup> HFTC KIT.
- 5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
- 6. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**STACK @ OS CORNER 7**

LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.

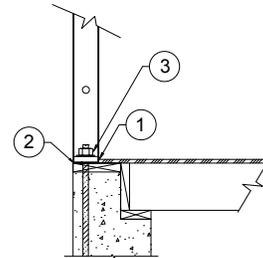


- 1. STEEL BEAM PER PLANS
- 2. HOLD DOWN ALL THREAD RODS THRU-BOLTED TO BOTTOM FLANGE OF STEEL BEAM BY BUILDING DESIGN PROFESSIONAL.
- 3. NUTS AND WASHERS AT PANEL BASE PER TABLE NOTE 1

**STEEL BM THRU-BOLT 13**

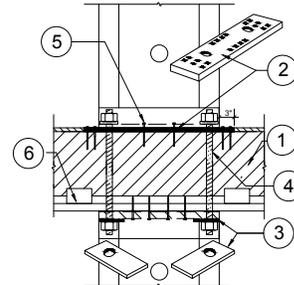
**NOTES:**

- A. CHECK WALL HEIGHT, *HARDY FRAME*<sup>®</sup> BEARING PLATES BELOW THE PANEL BASE OR CUSTOM HEIGHT PANELS ARE AVAILABLE TO AVOID FILLERS GREATER THAN 1-1/2".
- B. FOR MAXIMUM ALLOWABLE VALUES INSTALL PANEL ON CONCRETE



- 1. FLOOR SHEATHING NOTCHED, INSTALL PANEL ON WOOD PLATE.
- 2. 15# FELT OR EQUIVALENT RECOMMENDED BETWEEN PANEL BASE AND TREATED MUDSILL.
- 3. NUTS AND WASHERS PER TABLE NOTE 1.

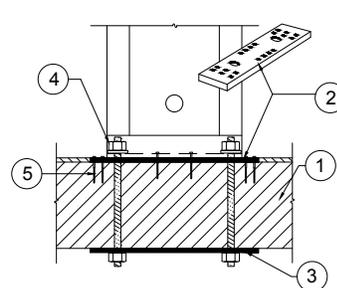
**RAISED STEM WALL 2**



- 1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
- 3. *HARDY FRAME*<sup>®</sup> STACKING WASHER (HFSW) AT TOP OF PANEL REQUIRED WHEN CONNECTING TO TENSION ANCHOR FROM ABOVE.
- 4. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN *HARDY FRAME*<sup>®</sup> HFTC KIT.
- 5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
- 6. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**STRAIGHT STACK 6**

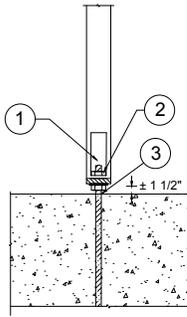
LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.



- 1. WOOD BEAM PER PLAN.
- 2. NOTCH FLOOR SHEATHING THEN INSTALL *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
- 3. *HARDY FRAME*<sup>®</sup> BEARING PLATE (HF<sub>XPB</sub>) OR BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM TENSION ANCHOR FORCES.
- 4. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN *HARDY FRAME*<sup>®</sup> HFTC KIT.
- 5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.

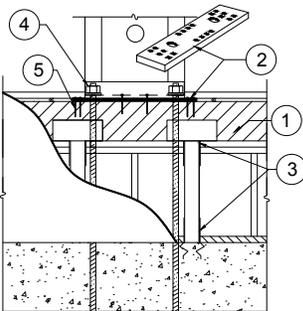
**WOOD BM THRU-BOLT 12**

REVISIONS	DATE



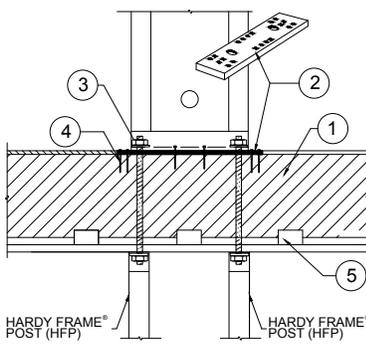
1. ACCESS HOLE LOCATED AT EDGE OF POST.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH 5,000 PSI STRENGTH NON-SHRINK GROUT (MIN).

**POST ON N&W** ①



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. NOTCH FLOOR SHEATHING THEN INSTALL **HARDY FRAME** BEARING PLATE (HFXPB) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
3. USP POST CAP AND POST BASE BY THE BUILDING DESIGN PROFESSIONAL.
4. NUTS AND WASHERS PER TABLE NOTE 1.
5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.

**CRIPPLE WALL** ⑤



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. NOTCH FLOOR SHEATHING THEN INSTALL **HARDY FRAME** BEARING PLATE (HFXPB) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
3. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN **HARDY FRAME** HFTC KIT.
5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
5. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**HFP POSTS BELOW** ⑪

Model Number	Net Height (in)	Depth (in)	Hold Down Diameter <sup>1</sup> (in)	Screw Quantity			Screw Qty <sup>4</sup> Available at Edges (ea)
				Panel	Top <sup>2</sup> (ea)	Bot <sup>3</sup> (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					6	

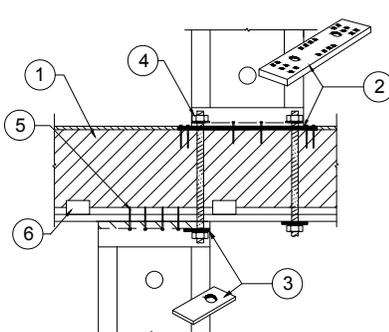
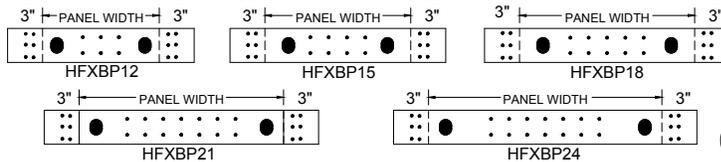
**NOTE:** **HARDY FRAME** STACKING WASHERS (HFSW) ARE REQUIRED IN THE TOP OF PANELS WHEN CONNECTING TO TENSION ANCHORS FROM ABOVE. **HARDY FRAME** "STK PANELS" INCLUDE HFSW WASHERS PRE-WELDED IN THE TOP CHANNEL.

1. HOLD DOWN TENSION ANCHORS SPECIFIED AS STANDARD GRADE (STD) MUST COMPLY WITH ASTM F1554 GRADE 36 (OR EQUAL). HOLD DOWN TENSION ANCHORS SPECIFIED AS HIGH STRENGTH (HS) MUST COMPLY WITH ASTM A 193 GRADE B7 (OR EQUAL). TENSION ANCHORS (BOTH GRADES) CONNECT TO THE UPPER AND LOWER PANELS WITH HARDENED ROUND WASHERS AND GRADE 8 NUTS. A **HARDY FRAME** "HFSW" STACKING WASHER IS REQUIRED IN THE TOP CHANNEL OF THE LOWER PANEL (AVAILABLE PRE-WELDED IN A **HARDY FRAME** "STK" PANEL). ALTERNATE WASHERS ARE (2 EA) ROUND-FLAT OR (2 EA) SAE WASHERS AT EACH ANCHOR CONNECTION. ALTERNATE NUTS ARE 2H HEAVY HEX.
2. 1/4" DIAMETER MITEK PRO SERIES WS SCREWS. 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 MITEK PRO SERIES WS SCREWS. LENGTH IS 4-1/2" (MINIMUM) AT CONNECTIONS TO FLOOR SYSTEMS AND BEAMS BELOW.
4. 1/4" DIAMETER SCREWS ARE REQUIRED AT THE EDGES WHEN INSTALLING A FILLER GREATER THAN 1-1/2" ABOVE OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.

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

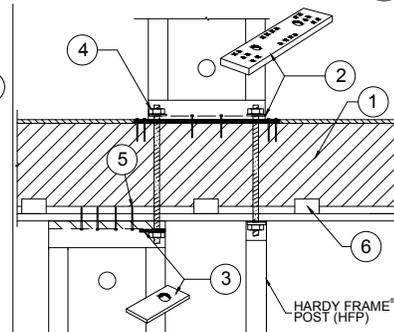
1. WITH HOLES PRE-DRILLED FOR 1-1/8" DIA TENSION ANCHORS, INSTALL A SOLID 4x (MINIMUM) RIM IN FLOOR SYSTEM AT PANEL LOCATION. ALLOWABLE VALUE TABLES ASSUME THE RIM IS ENGINEERED WOOD PRODUCT (EWP).
2. NOTCH FLOOR SHEATHING THEN INSTALL HFXPB ON RIM WITH 6 EACH 1/4"x4-1/2" (MIN) "WS" SCREWS AT EACH END.
3. PLACE PANEL ON HFXPB.
4. WHEN STACKING PANELS, INSTALL "HFSW" STACKING WASHERS IN THE TOP CHANNEL OF THE LOWER PANEL. CONNECT LOWER TO UPPER PANELS WITH TENSION ANCHORS (GRADE PER PLANS) AND SECURE AT BOTH ENDS WITH HARDENED ROUND WASHERS AND GRADE 8 NUTS TO BE SNUG TIGHT. **HARDY FRAME** "STK" PANELS THAT INCLUDE "HFSW" STACKING WASHERS PRE-WELDED IN THE TOP CHANNEL ARE AVAILABLE.
5. WHEN MORE THAN 12 SCREWS ARE REQUIRED FOR THE BOTTOM CONNECTION OR JOINTS IN FRAMING MEMBERS OCCUR AT SCREW LOCATIONS, INSTALL ADDITIONAL 1/4"x4-1/2" WS SCREWS THROUGH THE BASE OF PANEL WHERE THEY ALIGN WITH HOLES IN THE HFXPB.
6. FOR STANDARD WALL HEIGHTS, INSTALL A 2x FILLER ABOVE PANEL (DTL 5/HFX2). FOR FILLERS GREATER THAN 1-1/2" IN. SEE DETAIL 6/HFX2.

**NOTE:** INSTALLATIONS MAY VARY WITH JOB SPECIFIC CONDITIONS AND/OR SPECIFICATIONS BY THE BUILDING DESIGN PROFESSIONAL.



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. NOTCH FLOOR SHEATHING THEN INSTALL **HARDY FRAME** BEARING PLATE (HFXPB) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
3. **HARDY FRAME** STACKING WASHER (HFSW) AT TOP OF PANEL REQUIRED WHEN CONNECTING TO TENSION ANCHOR FROM ABOVE.
4. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN **HARDY FRAME** HFTC KIT.
5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
5. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**STAGGERED THRU-BOLT** ⑩



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. NOTCH FLOOR SHEATHING THEN INSTALL **HARDY FRAME** BEARING PLATE (HFXPB) AND PANEL PER INSTALLATION NOTES 3-6, DETAIL B/HFX3.
3. **HARDY FRAME** STACKING WASHER (HFSW) AT TOP OF PANEL REQUIRED WHEN CONNECTING TO TENSION ANCHOR FROM ABOVE.
4. 1-1/8" DIA. HOLD DOWN, HFSW AND N&W PER TABLE NOTE 1 ARE PROVIDED IN **HARDY FRAME** HFTC KIT.
5. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
5. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**STAGGERED-HFP POST** ⑨

**FLOOR SYSTEM DETAILS - HFX PANELS**

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

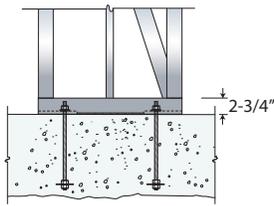
**HARDY FRAME**  
SHEAR WALL SYSTEM  
555 S. Promenade Ave., Suite 104, Corona, CA 92879  
(805) 477-0793 / www.hardyframe.com

**MiTek**

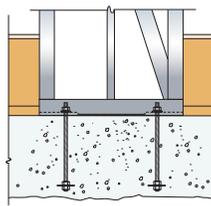
DATE:  
1-1-2020

**HFX3**

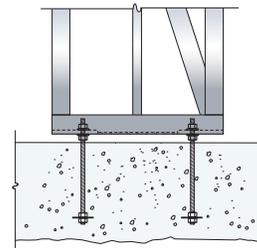




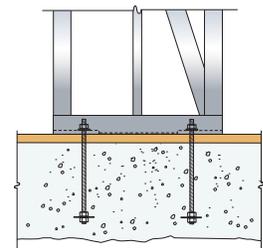
On concrete



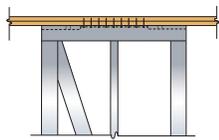
At raised floor head out



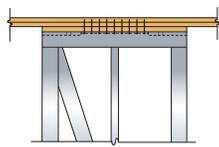
On nuts and washers  
(Requires 5,000 psi non-shrink grout). Check with building jurisdiction for 3rd party inspection requirements



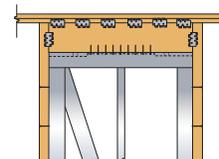
On wood sill



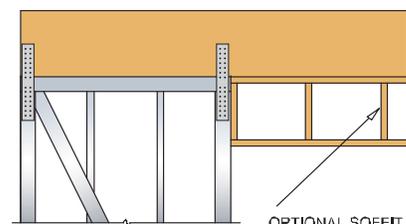
Connection to top plates  
1 1/4 x 3" WS-Series screws



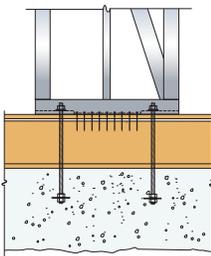
With 2x filler  
1/4 x 4 1/2" WS-Series screws



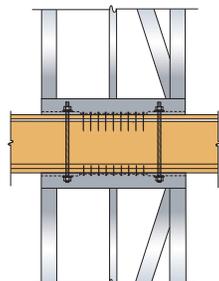
With 4x filler  
1/4 x 3" WS-Series screws and MP4 F connectors (qty by design professional). Screws or MP4 F required at adjacent framing



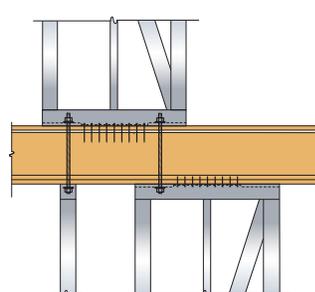
Portal condition 1/4 x 3" WS-Series screws and USP KRPS straps (when required by design professional). Use #10 self tapping screws to Brace Frame and 16d nails to header.



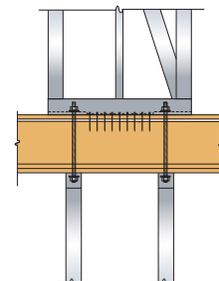
On raised floor  
1/4 x 4 1/2" WS-Series screws



Straight-Stack installation  
(check cumulative forces)

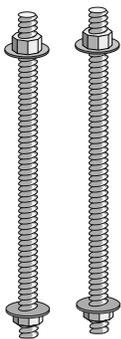


Stagger-Stack installation



Two MiTek® Hardy Frame® Posts below

Floor to Floor connectors



**HFTC**

2 per kit

MiTek® Hardy Frame®  
Tension Connector Kit Components

Model Number	"HFSW" Stacking Washer	Brace Frames	
		Anchor Bolt Assembly	
		7/8 STD	7/8 HS
HFTC-7/8 STD	NA	2	
HFTC-7/8 HS	NA		2

Connector Rod Assemblies:

- 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) Plate washers are built into all four corners of Brace Frames. "HFSW" washers are not required.
- 2) All Thread length fits up to a 14" joist depth + 3/4" subfloor + (4) 2x wood plates
- 3) Each Hardened Round Washer may be substituted with two SAE or two Round-Flat Washers
- 4) HS all thread rods provided by MiTek® Hardy Frame®s are stamped on both ends

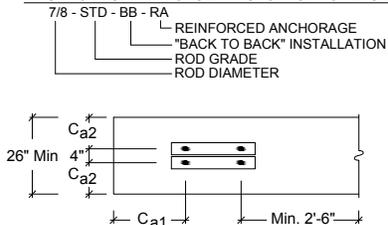


Refer to the MiTek® Hardy Frame® Product Catalog and Installation Details for more specific information

BACK TO BACK REINFORCED ANCHORAGE (BB-RA)

Model	Brace Frame Height	Anchorage <sup>1</sup>	Rod Dia (in)	Rod Grade <sup>2,3</sup>	BB-RA <sup>4</sup>		Stirrups <sup>9</sup> (in)	Shear <sup>7</sup> Ties	
					Ca1 (in) <sup>5</sup>	Ca2 (in) <sup>6</sup>			
HFX-32x	8' - 13'	1-1/8-STD-BB-RA	7/8	STD	15	23-3/4	11	12 - #4	# 3 (min) @ 4" OC
		1-1/8-HS-BB-RA							
HFX-44x	8' - 13'	1-1/8-STD-BB-RA	7/8	STD	15	24-1/2	11	12 - #4	# 3 (min) @ 4" OC
		1-1/8-HS-BB-RA							

BACK TO BACK REINFORCED ANCHORAGE NOMENCLATURE

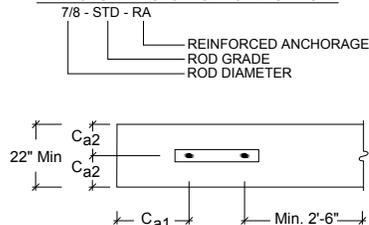


3

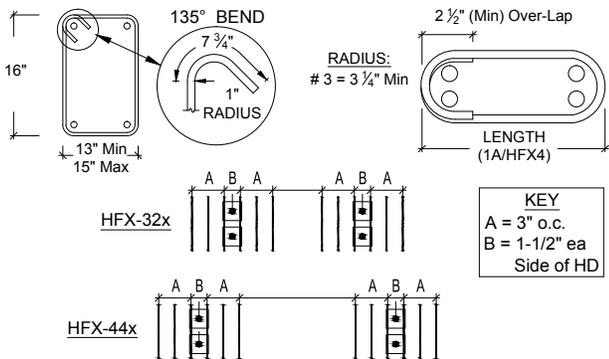
REINFORCED ANCHORAGE (RA)

Model	Brace Frame Height	Anchorage <sup>1</sup>	Rod Dia (in)	Rod Grade <sup>2,3</sup>	RA <sup>4</sup>		Stirrups <sup>9</sup> (in)	Shear <sup>7</sup> Ties	
					Ca1 (in) <sup>5</sup>	Ca2 (in) <sup>6</sup>			
HFX-32x	8' - 13'	1-1/8-STD-RA	7/8	STD	15	23-3/4	11	12 - #4	# 3 (min) @ 4" OC
		1-1/8-HS-RA							
HFX-44x	8' - 13'	1-1/8-STD-RA	7/8	STD	15	24-1/2	11	12 - #4	# 3 (min) @ 4" OC
		1-1/8-HS-RA							

REINFORCED ANCHORAGE NOMENCLATURE

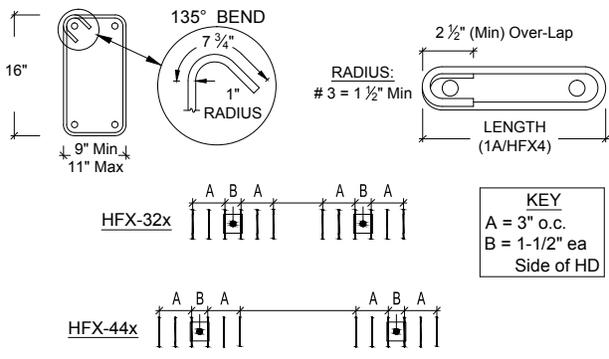


2



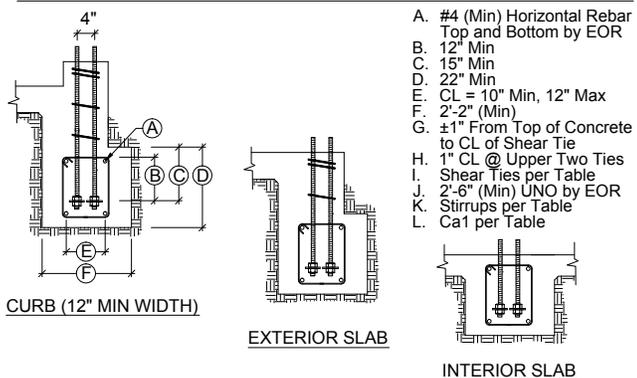
BB-RA SHEAR TIES & STIRRUPS

3A



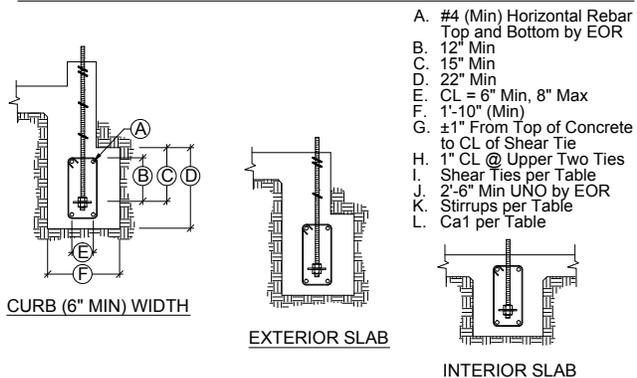
RA SHEAR TIES & STIRRUPS

2A



BB-RA SECTIONS & ELEVATIONS

3B



RA SECTIONS & ELEVATIONS

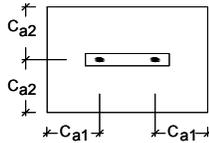
2B

**UNREINFORCED ANCHORAGE (UA)**

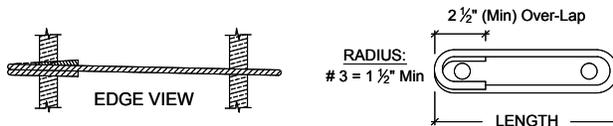
Model	Brace Frame Height	Anchorage <sup>1</sup>	Rod Dia (in)	UA			Shear <sup>7,8</sup> Ties
				Rod Grade <sup>2,3</sup>	l <sub>e</sub> <sup>4</sup> (in)	Ca1 <sup>5</sup> & Ca2 <sup>6</sup> (in)	
HFX-32x	8' - 13'	7/8-STD-10-14	7/8	STD	10	14	1 - # 3
		7/8-HS-15-22		HS	15	22	
HFX-44x	8' - 13'	7/8-STD-10-14		STD	10	14	1 - # 3
		7/8-HS-15-22		HS	15	22	

**UNREINFORCED ANCHORAGE NOMENCLATURE**

7/8 - STD - 10 - 14  
 END & EDGE DISTANCE (Ca1 & Ca2)  
 EMBEDMENT DEPTH (l<sub>e</sub>)  
 ROD GRADE  
 ROD DIAMETER



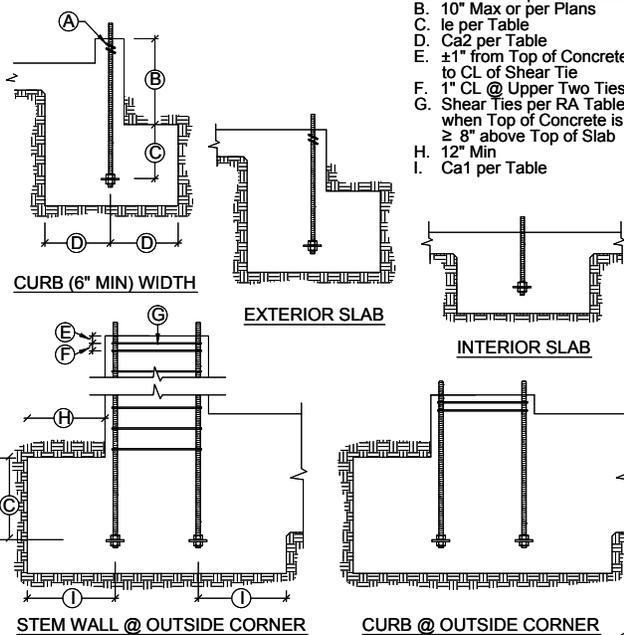
1



SHEAR TIES		NOT REQUIRED WHEN	
Model	Length	End Distance ≥	Edge Distance ≥
HFX-32x	22-1/2"	10-3/8"	6"
HFX-44x	33"	10-3/8"	6"

**UA SHEAR TIES**

1A

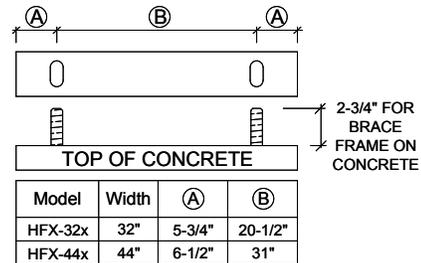


**UA SECTIONS & ELEVATIONS**

1B

**TABLE NOTES**

- DESIGNS ARE TO RESIST LOADING PER ACI 318-14, SECTION 17.2.3.4.3.
- STD INDICATES ANCHORS COMPLYING WITH ASTM F1554 GRADE 36 WITH A 1/2"x3"x3"(MIN) HFPW PLATE WASHER INSTALLED WITH DOUBLE NUTS ON THE EMBED END.
- HS INDICATES ANCHORS COMPLYING WITH ASTM A193 GRADE B7 WITH A 1/2"x3"x3"(MIN) HFPW PLATE WASHER INSTALLED WITH DOUBLE NUTS ON THE EMBED END.
- HS INDICATES ANCHORS COMPLYING WITH ASTM A193 GRADE B7 WITH A 1/2"x3"x3"(MIN) HFPW PLATE WASHER INSTALLED WITH DOUBLE NUTS ON THE EMBED END.
- 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 AND REQUIRED FOR NEAR EDGE DISTANCE CONDITIONS PER ACI-318-14, F<sub>C</sub> = 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, ADDITIONAL TIES MAY BE REQUIRED AT STEM WALLS. SHEAR TIES ARE NOT REQUIRED FOR INSTALLATION AWAY FROM 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 318-14, SECTION 17.7.1



**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.
- HIGH STRENGTH ALL-THREAD RODS PROVIDED BY MITEK HARDY FRAME ARE STAMPED ON BOTH ENDS.

HF  
B7

**IMPORTANT NOTES**

B

REVISIONS	DATE

ANCHORAGE DETAILS - HFX BRACE FRAMES

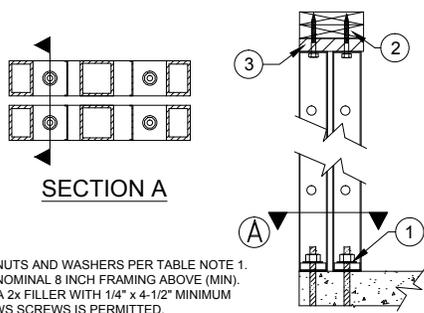
THIS DETAIL SHEET IS NOT PROPRIETARY AND IS NOT REQUIRED FOR PLAN SUBMITTAL WITH HARDY FRAME PRODUCTS

**HARDY FRAME**<sup>®</sup>  
SHEAR WALL SYSTEM  
555 S. Promenade Ave., Suite 104, Corona, CA 92879  
(805) 477-0793 / www.hardyframe.com

MiTek<sup>®</sup>

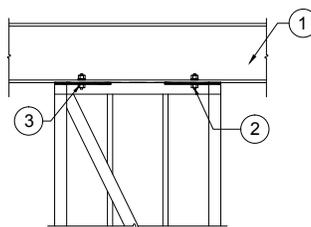
DATE:  
1-1-2018

HFX4



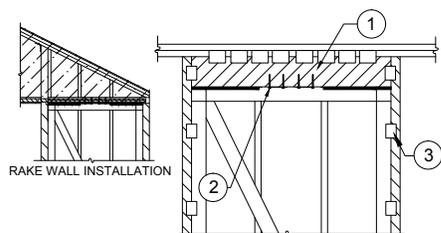
BACK TO BACK INSTALLATION ③

1. NUTS AND WASHERS PER TABLE NOTE 1.
2. NOMINAL 8 INCH FRAMING ABOVE (MIN).
3. A 2x FILLER WITH 1/4" x 4-1/2" MINIMUM WS SCREWS IS PERMITTED.



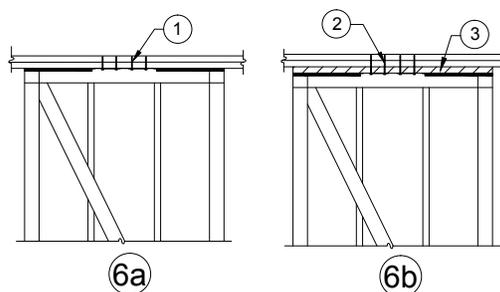
STEEL BEAM ABOVE ②

1. STEEL BEAM PER PLANS
2. ALL THREAD RODS THRU-BOLTED TO STEEL BEAM BY BUILDING DESIGN PROFESSIONAL.
3. NUTS AND WASHERS PER TABLE NOTE 1.



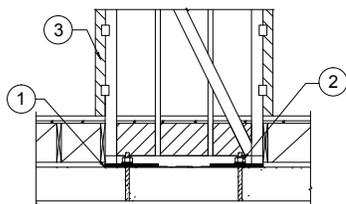
FILLER GREATER THAN 1-1/2 IN. ⑥

1. WOOD FILLER WITH USP MP4F CONNECTORS BOTH SIDES, QUANTITY BY BUILDING DESIGN PROFESSIONAL.
2. 1/4" x 3" (MINIMUM) WS SCREWS, QUANTITY PER TABLES
3. ADJACENT FRAMING WITH #10 SELF-TAPPING SCREWS OR USP MP4F CONNECTORS BOTH SIDES OF FRAME AND BOTH SIDES OF FILLER TO KING POST. SEE TABLE NOTE 3, DETAIL A AND INSTALLATION INSTRUCTION NOTE 4, DETAIL B.



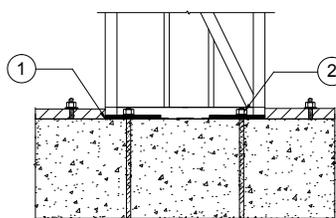
TOP PLATE CONNECTIONS ⑤

1. 1/4" x 3" (MINIMUM) WS SCREWS, QUANTITY PER TABLES
2. 1/4" x 4-1/2" (MINIMUM) WS SCREWS, QUANTITY PER TABLES
3. 2x WOOD FILLER.



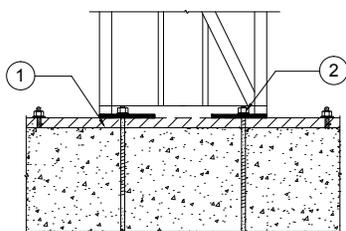
RAISED FLOOR HEAD-OUT ⑧

1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN BRACE FRAME BASE AND CONCRETE.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. ADJACENT FRAMING WITH #10 SELF-TAPPING SCREWS OR USP MP4F CONNECTORS BOTH SIDES OF FRAME WHEN INSTALLING A FILLER GREATER THAN 1-1/2" ABOVE OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.



INSTALLATION ON CONCRETE ⑦

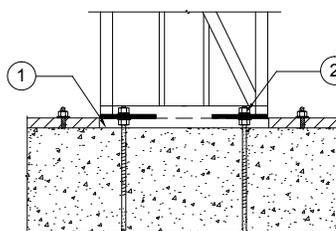
1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND CONCRETE.
2. NUTS AND WASHERS PER TABLE NOTE 1.



ALLOWABLE VALUES ON 2x PLATE ARE LESS THAN ON CONCRETE

INSTALLATION ON 2x PLATE ⑪

1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN PANEL BASE AND TREATED PLATE.
2. NUTS AND WASHERS PER TABLE NOTE 1.



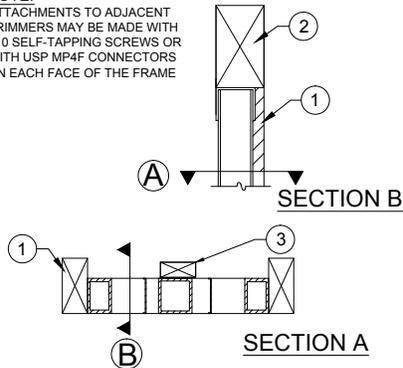
ALLOWABLE VALUES ON N&W ARE LESS THAN INSTALLATION ON CONCRETE

INSTALLATION ON NUTS & WASHERS ⑩

1. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH 5,000 PSI NON-SHRINK GROUT (MINIMUM).
2. NUT AND WASHER GRADES PER TABLE NOTE 1.

NOTE:

ATTACHMENTS TO ADJACENT TRIMMERS MAY BE MADE WITH #10 SELF-TAPPING SCREWS OR WITH USP MP4F CONNECTORS ON EACH FACE OF THE FRAME



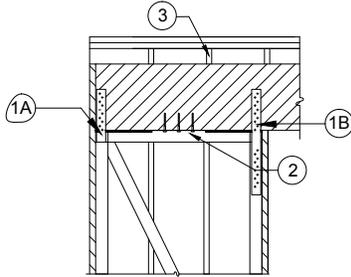
- TRIMMERS PROVIDE FULL BEARING FOR HEADER ABOVE, DESIGN AND CONNECTIONS BY BUILDING DESIGN PROFESSIONAL.
- 6x HEADER.
- WOOD MEMBER FLUSH TO FACE OF WALL FOR BACKING AS NEEDED.

6x HEADER ABOVE-SECTION ①

HFX BRACE FRAMES NOMINAL 8 THROUGH 13 FEET

MODEL NUMBER	NET HEIGHT (in)	DEPTH (in)	Hold Down Diameter <sup>1</sup> (in)	Top Screw <sup>2</sup> Qty (ea)	Screw Qty <sup>3</sup> Available at Edges (ea)
HFX-32x8	92-1/4	3-1/2	7/8	32" Width = 10	NA
HFX-44x8					
HFX-32x9	104-1/4				
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					

- HOLD DOWN ANCHOR BOLTS CONNECT TO THE BRACE FRAME BASE WITH HARDENED ROUND WASHERS BELOW GRADE 8 NUTS. ALTERNATE WASHERS ARE (2 EA) ROUND-FLAT OR (2 EA) SAE WASHERS ON EACH BOLT. ALTERNATE NUTS ARE 2H HEAVY HEX.
- 1/4" DIAMETER MITEK® PRO SERIES™ WS SCREWS. LENGTH IS 3" (MINIMUM) WHEN ATTACHED DIRECTLY TO THE COLLECTOR AND 4-1/2" (MINIMUM) WHEN INSTALLING A 2x FILLER ABOVE THE BRACE FRAME.
- ADJACENT FRAMING CONNECTED TO THE BRACE FRAME EDGES AND THE FILLER IS REQUIRED WHEN INSTALLING A FILLER ABOVE THE TOP CHANNEL THAT IS GREATER THAN 1-1/2" OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.

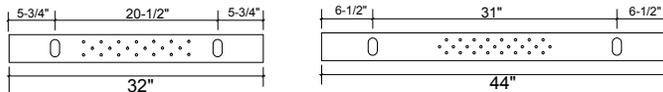


- (A) PRE-WELDED STRAPS ARE AVAILABLE UPON REQUEST. (B) FIELD INSTALLED STRAPS WITH SELF TAPPING SCREWS ARE PERMITTED. THE DESIGN AND CONNECTION IS BY THE DESIGN PROFESSIONAL.
- A 2x WOOD FILLER WITH 1/4"x4-1/2" (MIN.) WS SCREWS IS PERMITTED.
- WHEN CRIPPLE STUDS OCCUR, SHEAR TRANSFER DESIGN TO BE PER THE BUILDING DESIGN PROFESSIONAL.

TOP CONNECTION TO HEADER ④

INSTALLATION INSTRUCTIONS

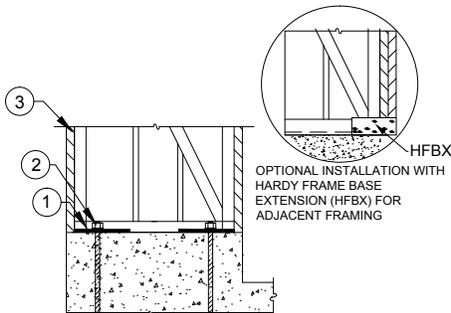
- WHEN INSTALLING ON CONCRETE CONNECT WITH (1 EA) HARDENED ROUND WASHER BELOW (1 EA) GRADE 8 NUT, SECURE WITH A SOCKET OR WRENCH UNTIL SNUG TIGHT. ALTERNATE WASHERS AND NUTS ARE PROVIDED IN TABLE NOTE 1.
- INSTALLATION ON CONCRETE PROVIDES THE HIGHEST ALLOWABLE VALUES. CONFIRM WITH THE DESIGN PROFESSIONAL BEFORE INSTALLING ON OTHER SUPPORTING SURFACES.
- USE 1/4"x4-1/2" MITEK® PRO SERIES™ WS SCREWS AT TOP CONNECTIONS WITH A 2x FILLER. IF THE TOP OF BRACE FRAME IS IN DIRECT CONTACT WITH THE COLLECTOR ABOVE (TOP PLATES, HEADER, BEAM, ETC.) USE 1/4 x 3" (MINIMUM)
- FOR INSTALLATIONS WITH A FILLER GREATER THAN 1-1/2" ABOVE. OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL, ADJACENT KING POSTS TO BRACE THE OUT-OF-PLANE HINGE CAN BE CONNECTED TO THE BRACE FRAME WITH SELF-TAPPING SCREWS INSTALLED THROUGH HOLES PRE-DRILLED IN THE WOOD MEMBER OR WITH USP MPF4 CONNECTORS ON EACH FACE OF THE FRAME TO THE WOOD MEMBER. FOR BOTH METHODS OF CONNECTING THE FASTENER QUANTITY IS DETERMINED BY THE BUILDING DESIGN PROFESSIONAL.



32" BRACE FRAME

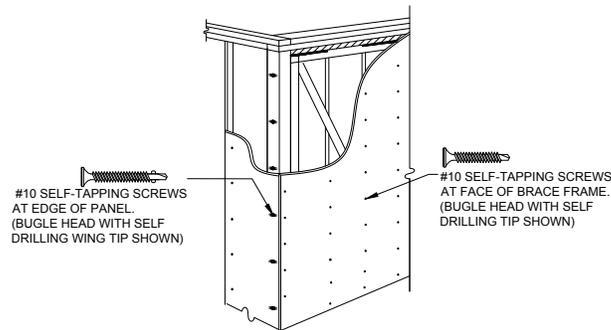
44" BRACE FRAME

HOLE PATTERN TOP & BOTTOM ③



- 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN BRACE FRAME BASE AND CONCRETE.
- NUTS AND WASHERS PER TABLE NOTE 1.
- ADJACENT FRAMING OPTIONAL OR BY BUILDING DESIGN PROFESSIONAL.

INSTALLATION ON CURB ⑨



NOTES:

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

REVISIONS	DATE

FRAMING DETAILS - HFX BRACE FRAMES

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

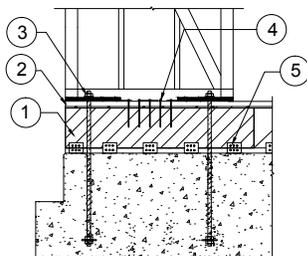
**HARDY FRAME®**  
SHEAR WALL SYSTEM  
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HFX5

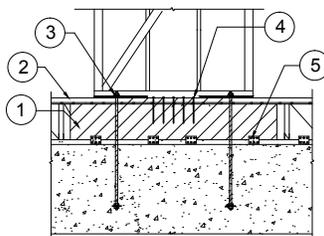
NOTE:  
COUPLERS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



1. 4x MINIMUM RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT
2. WOOD PLATE BELOW BRACE FRAME
3. NUTS AND WASHERS PER TABLE NOTE 1
4. 1/4" x 4-1/2" (MIN) WS SCREWS PER TABLE NOTE 3
5. USP MP4F CONNECTORS QUANTITY BY THE DESIGN PROFESSIONAL

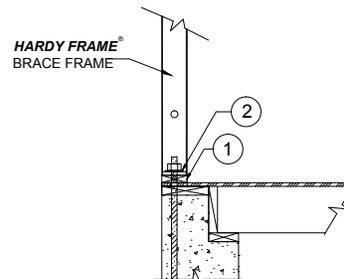
RAISED-OS CORNER ④

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



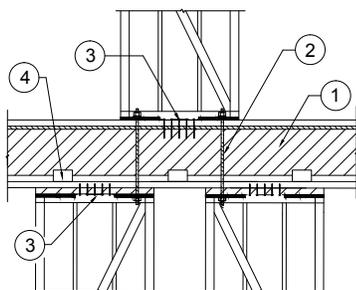
1. 4x MINIMUM RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT
2. WOOD PLATE BELOW BRACE FRAME
3. NUTS AND WASHERS PER TABLE NOTE 1
4. 1/4" x 4-1/2" (MIN) WS SCREWS PER TABLE NOTE 3
5. USP MP4F CONNECTORS QUANTITY BY THE DESIGN PROFESSIONAL

RAISED FLOOR ③



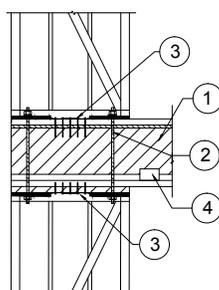
1. INSTALL BRACE FRAME ON 2x PLATE OVER SHEATHING
2. NUTS AND WASHERS PER TABLE NOTES 1 AND 2

RAISED STEM WALL ②



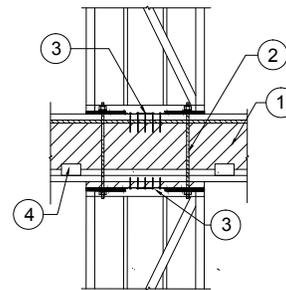
1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

PYRAMID STACK ⑧



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

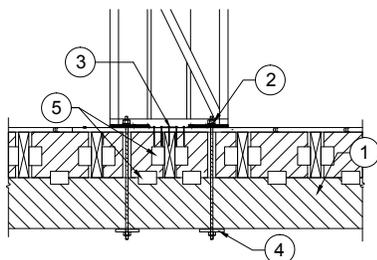
STACK @ OS CORNER ⑦



1. 4x (MIN) RIM, ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

STRAIGHT STACK ⑥

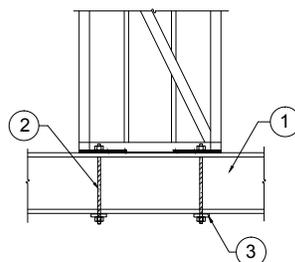
LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.



1. DROP BEAM WITH FLOOR JOIST ABOVE PER PLAN.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM TENSION ANCHOR FORCES.
5. USP CONNECTORS BY DESIGN PROFESSIONAL

DROP BM - FL SYSTEM ⑭

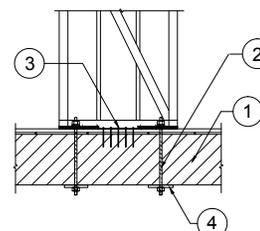
LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.



1. STEEL BEAM PER PLAN
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. PLATE WASHER AT UNDERSIDE OF STEEL BEAM IF SPECIFIED BY THE BUILDING DESIGN PROFESSIONAL.

STEEL BM THRU-BOLT ⑬

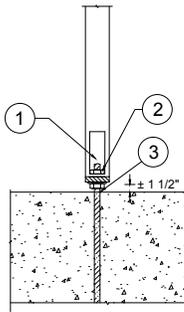
LOAD PATH FROM BEAM TO FOUNDATION AND CHECK THAT PANEL DRIFT IS WITHIN CODE LIMIT BY BUILDING DESIGN PROFESSIONAL.



1. WOOD BEAM PER PLAN.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM TENSION ANCHOR FORCES.

WOOD BM THRU-BOLT ⑫

REVISIONS	DATE



1. ACCESS HOLE LOCATED AT EDGE OF POST.
2. NUTS AND WASHERS PER TABLE NOTE 1.
3. PLUS OR MINUS 1-1/2" GAP TO BE FILLED WITH 5,000 PSI STRENGTH NON-SHRINK GROUT (MIN).

**POST ON N&W**

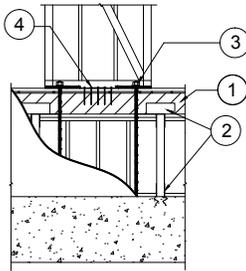
1

MODEL NUMBER	NET HEIGHT (in)	DEPTH (in)	Hold Down Diameter <sup>1</sup> (in)	Top Screw <sup>2</sup> Qty (ea)	Bottom Screw <sup>3</sup> 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	104-1/4					
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. TENSION ANCHORS SPECIFIED AS STANDARD GRADE (STD) MUST COMPLY WITH ASTM F1554 GRADE 36 (OR EQUAL) TENSION ANCHORS SPECIFIED AS HIGH STRENGTH (HS) MUST COMPLY WITH ASTM A 193 GRADE B7 (OR EQUAL). TENSION ANCHORS (BOTH GRADES) CONNECT TO THE UPPER AND LOWER BRACE FRAMES WITH HARDENED ROUND WASHERS AND GRADE 8 NUTS. ALTERNATE WASHERS ARE (2 EA) ROUND-FLAT OR (2 EA) SAE WASHERS AT EACH ANCHOR CONNECTION. ALTERNATE NUTS ARE 2H HEAVY HEX.
2. 1/4" DIAMETER MITEK "PRO SERIES" WS SCREWS. LENGTH IS 3" (MINIMUM) WHEN ATTACHING DIRECTLY TO THE COLLECTOR AND 4-1/2" (MINIMUM) WHEN INSTALLING A 2x FILLER ABOVE THE BRACE FRAME.
3. 1/4" DIAMETER MITEK "PRO SERIES" WS SCREWS. LENGTH IS 4-1/2" (MINIMUM) AT CONNECTIONS TO FLOOR SYSTEMS AND BEAMS BELOW.

A

**NOTE:**  
COUPLERS MAY BE USED WHEN THREADED ROD IS SUBJECT TO TENSION LOADS ONLY.



1. 4x (MIN) RIM. ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. USP POST CAP AND POST BASE BY THE BUILDING DESIGN PROFESSIONAL.
3. NUTS AND WASHERS PER TABLE NOTE 1.
4. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.

**CRIPPLE WALL**

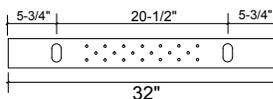
5

**INSTALLATION ON FLOOR SYSTEM INSTRUCTIONS**

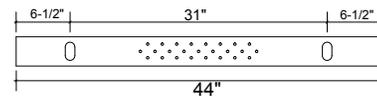
1. WITH HOLES PRE-DRILLED FOR 7/8" DIA. TENSION ANCHORS, INSTALL A SOLID 4x (MINIMUM) RIM IN FLOOR SYSTEM AT BRACE FRAME LOCATION. ALLOWABLE VALUE TABLES ASSUME THE RIM IS ENGINEERED WOOD PRODUCT (EWP).
2. AFTER FLOOR SHEATHING, CUT AND PLOT THE BOTTOM PLATE OR THE PLATE CAN BE CONTINUOUS.
3. INSTALL THE FRAME ON THE WOOD PLATE AND SECURE ANCHORS WITH HARDENED ROUND WASHERS AND GRADE 8 NUTS TO BE SNUG TIGHT.
4. WHEN STACKING FRAMES, CONNECT THE LOWER FRAME TO THE UPPER FRAME WITH TENSION ANCHORS (GRADE PER PLANS) AND SECURE AT BOTH ENDS WITH HARDENED ROUND WASHERS AND GRADE 8 NUTS TO BE SNUG TIGHT. HARDY FRAME® BRACE FRAMES AND POSTS (HFP) INCLUDE PLATE WASHERS PRE-WELDED IN THE TOP AND BOTTOM CHANNELS.
5. INSTALL 1/4"x4-1/2" (MIN) MITEK "PRO SERIES" WS SCREWS THROUGH THE BOTTOM CHANNEL. SEE TABLE FOR MINIMUM QUANTITY.
6. WHEN JOINTS IN FRAMING MEMBERS OCCUR AT SCREW LOCATIONS, INSTALL ADDITIONAL SCREWS.
7. FOR STANDARD WALL HEIGHTS, INSTALL 1/4"x3" (MIN) MITEK "PRO SERIES" WS SCREWS THROUGH THE TOP CHANNEL INTO THE COLLECTOR. SEE TABLE FOR MINIMUM QUANTITIES.

**NOTE:** INSTALLATIONS MAY VARY WITH JOB SPECIFIC CONDITIONS AND/OR SPECIFICATIONS BY THE DESIGN PROFESSIONAL.

B



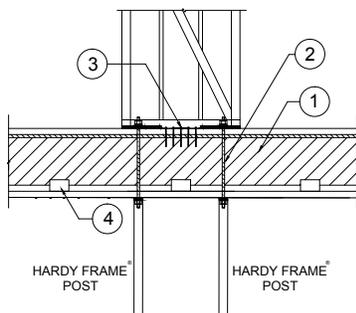
**32" BRACE FRAME**



**44" BRACE FRAME**

**HOLE PATTERN TOP & BOTTOM**

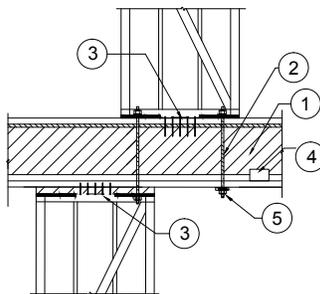
C



1. 4x (MIN) RIM. ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**HFP POSTS BELOW**

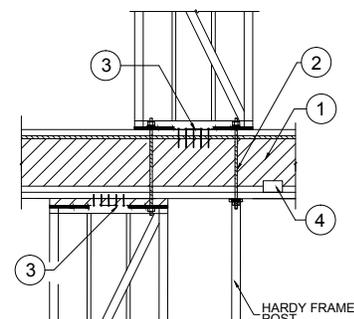
11



1. 4x (MIN) RIM. ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.
5. BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM TENSION ANCHOR FORCES.

**STAGGERED THRU-BOLT**

10



1. 4x (MIN) RIM. ALLOWABLE VALUE TABLES ASSUME ENGINEERED WOOD PRODUCT.
2. 7/8" DIA. HOLD DOWN AND N&W PER TABLE NOTE 1 ARE PROVIDED IN HARDY FRAME® HFTC KIT.
3. 1/4" x 4-1/2" (MIN) WS SCREWS, QUANTITY PER TABLE.
4. USP MP4F CONNECTORS, QUANTITY BY BUILDING DESIGN PROFESSIONAL.

**STAGGERED-HFP POST**

9

**FLOOR SYSTEMS - HFX BRACE FRAMES**

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

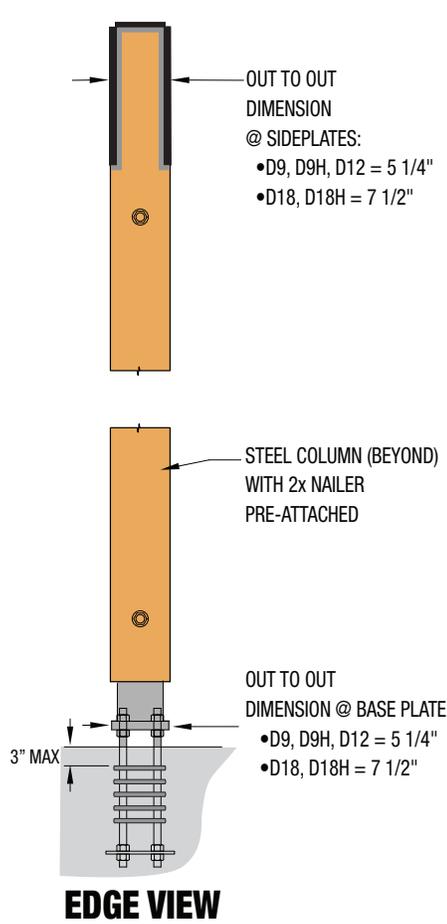
**HARDY FRAME®**  
SHEAR WALL SYSTEM

555 S. Promenade Ave., Suite 104, Corona, CA 92879  
(805) 477-0793 / www.hardyframe.com

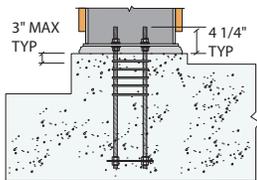
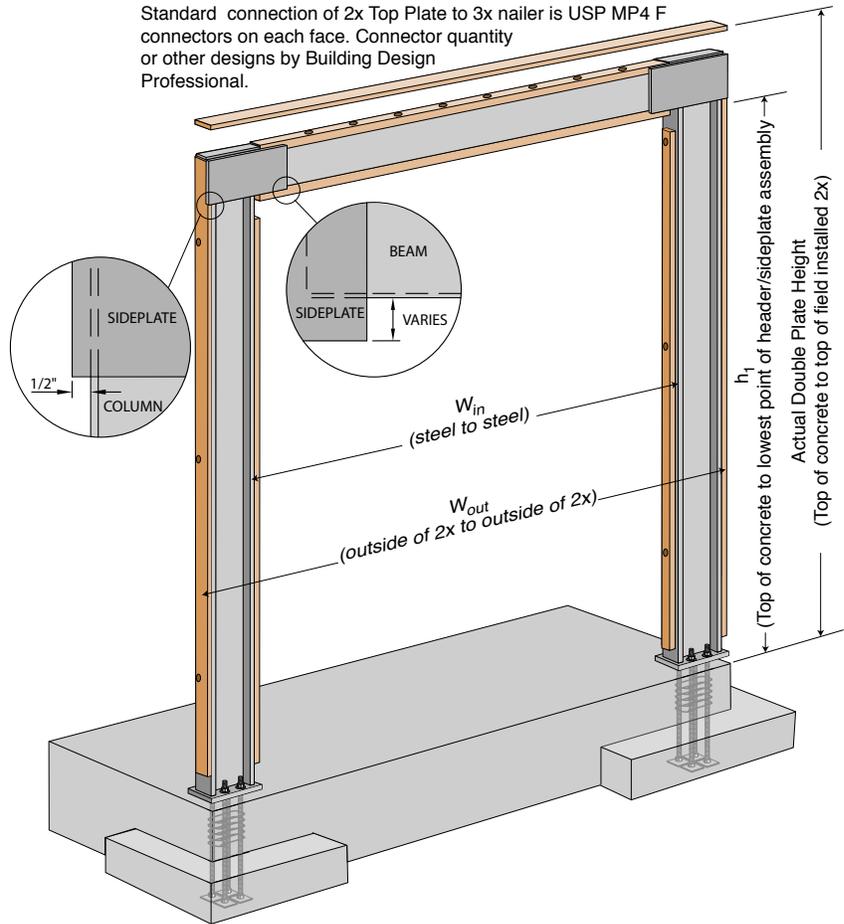
**MiTek®**

**DATE:**  
1-1-2018

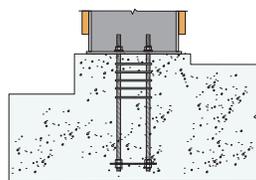
**HFX6**



Standard connection of 2x Top Plate to 3x nailer is USP MP4 F connectors on each face. Connector quantity or other designs by Building Design Professional.



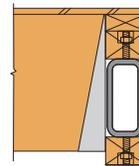
**Pinned Base on Nuts & Washer** (Requires high strength non-shrink grout. Check with Building Jurisdiction for third party inspection requirements)



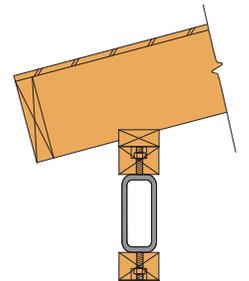
**Pinned base on Concrete**



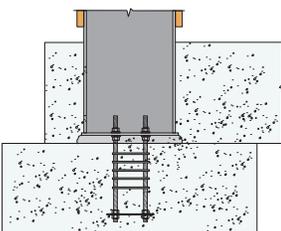
**Section of Header with Nailers and Plate**



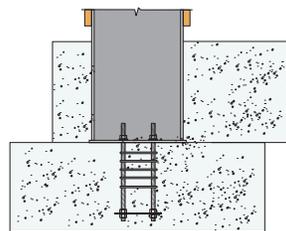
**Section at Joist - Hanging Condition**



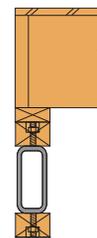
**Section at Roof Framing**



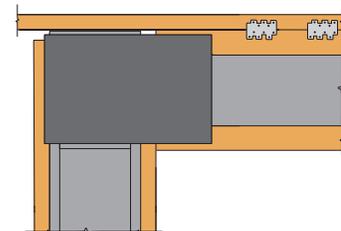
**Fixed Base on Nuts & Washer** (Requires high strength non-shrink grout. Check with Building Jurisdiction for third party inspection requirements)



**Fixed base on Concrete**



**Section at Joist - Bottom Cord Bearing**



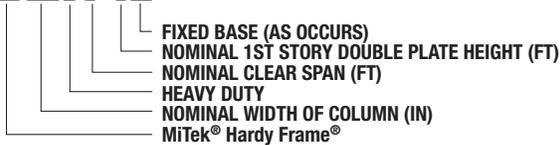
**Elevation at header USP MP4-F** (or equal) connectors on each face for shear transfer. Minimum quantity by Building Design Professional.

See the MiTek® Hardy Frame® Moment Frame Catalog for more complete product listing

Col Type & Nom Opening Width	W <sub>in</sub> (ft-in)	Wout (ft-in)	Wall Height						
			8' 0-3/4"		9' 0-3/4"		10' 0-3/4"		
			h <sup>1</sup> Opening Height (ft-in)	Weight (lbs)	h <sup>1</sup> Opening Height (ft-in)	Weight (lbs)	h <sup>1</sup> Opening Height (ft-in)	Weight (lbs)	
HF-D9 6x	6' 7"	8' 4"	7' 0-1/4"	987	8' 0-1/4"	1,064	9' 0-1/4"	1,141	
HF-D9 8x			1,051	1,128		1,205			
HF-D9H 8x		10' 4"	6' 11-1/4"	1,102	7' 11-1/4"	1,179		8' 11-1/4"	1,256
HF-D12 8x			10' 10-1/2"	7' 0-1/4"	890	8' 0-1/4"		938	9' 0-1/4"
HF-D18 8x	8' 7"	11' 9-1/2"	6' 11-3/4"	1,412	7' 11-3/4"	1,490	8' 11-3/4"	1,567	
HF-D9 10x		12' 4"	6' 11-1/4"	1,173	7' 11-1/4"	1,250	8' 11-1/4"	1,327	
HF-D12 10x			12' 10-1/2"	7' 0-1/4"	954	8' 0-1/4"	1,002	9' 0-1/4"	1,051
HF-D18 10x		13' 9-1/2"	6' 9-1/4"	1,650	7' 9-1/4"	1,728	8' 9-1/4"	1,805	
HF-D9 12x	12' 7"	14' 4"	6' 11-1/4"	1,244	7' 11-1/4"	1,321	8' 11-1/4"	1,398	
HF-D12 12x		14' 10-1/2"	7' 0-1/4"	1,018	8' 0-1/4"	1,067	9' 0-1/4"	1,115	
HF-D18 12x		15' 9-1/2"	6' 9-1/4"	1,746	7' 9-1/4"	1,824	8' 9-1/4"	1,901	
HF-D9 14x		14' 7"	16' 4"	6' 11-1/4"	1,315	7' 11-1/4"	1,392	8' 11-1/4"	1,469
HF-D12 14x	16' 10-1/2"		7' 0-1/4"	1,083	8' 0-1/4"	1,131	9' 0-1/4"	1,180	
HF-D18 14x	17' 9-1/2"		6' 9-1/4"	1,842	7' 9-1/4"	1,919	8' 9-1/4"	1,997	
HF-D18H 14x	17' 10"		6' 5-3/4"	2,372	7' 5-3/4"	2,471	8' 5-3/4"	2,570	
HF-D9 16x	16' 7"	18' 4"	6' 10-1/4"	1,462	7' 10-1/4"	1,539	8' 10-1/4"	1,616	
HF-D18 16x		19' 9-1/2"	6' 9-1/4"	1,938	7' 9-1/4"	2,015	8' 9-1/4"	2,093	
HF-D18H 16x		19' 10"		2,502		2,601		2,701	
HF-D18H 18x		21' 10"	6' 5-3/4"	2,633	7' 5-3/4"	2,732	8' 5-3/4"	2,831	
HF-D18H 20x	20' 7"	23' 10"		2,763		2,862		2,962	

**MOMENT FRAME NOMENCLATURE**

HF-D18 H 8 X 9 FB

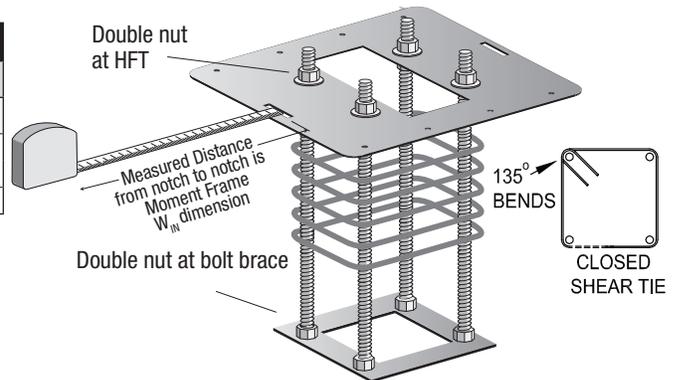


- For a complete list of standard sizes see the MiTek® Hardy Frame® Moment Frame Catalog
- Two Story Frames available
- All model numbers shown ship pre-assembled; over-sized frames ship as “knock-down” units that require field welding and special inspection by others

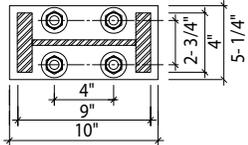
**Moment Frame Template Kits**

Column Type	HFT Model	Hold Down Rods		
		Grade	Diameter(in)	Length (in)
D9 & D9H	HFTK-D9	STD	3/4	32
D12	HFTK-D12			
D18 & D18H	HFTK-D18	HS		36

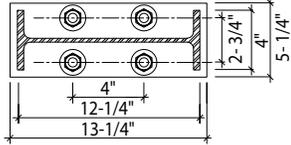
STD (Standard) rods are ASTM F1554 Grade 36  
 HS (High Strength) rods are ASTM A 193 Grade B7  
 All Template Kits include: 2-Templates (HFT)  
 2-Bolt Braces (HFBB)  
 8-Threaded Rods with 2 washers & 4 nuts for each rod  
 #3 Grade 40 rebar Shear Ties per the Anchorage Schedule



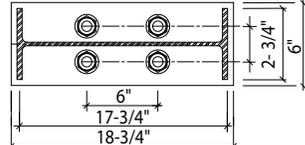
**D9 & D9H = BUILT UP COLUMN**



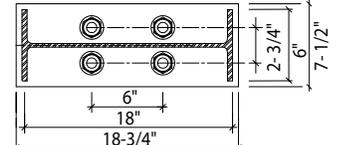
**D12=W12 x 22**



**D18 = W18 x 35**



**D18H = W18x46**



**MiTek® Hardy Frame® Moment Frame: Anchorage Schedule<sup>1,2</sup>**

Column Type	Anchorage Designation	Embed From Top of Footing l <sub>e</sub> (in)	Min Edge & End Dist at Footing (in)	Min Edge Dist at T.O. Conc (IN)	Min End Dist at T.O. Conc (IN)	Anchor QTY DIA & Grade Per Column (IN)	Closed Shear Tie Min QTY, Size & Spacing
D9	D9-Pinned	12	19	2 3/8	4	4 EA 3/4-STD	4 EA #3 @ 3" OC
D9H	D9H-Pinned						
D12	D12-Pinned	18	27	2 3/8	7 3/8	4 EA 3/4 - HS	5 EA #3 @ 3" OC
D18	D18-Pinned						
D18H	D18H-Pinned						

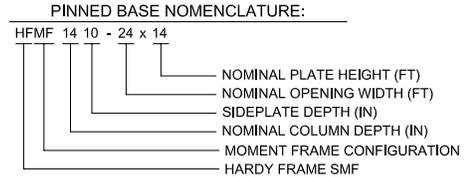
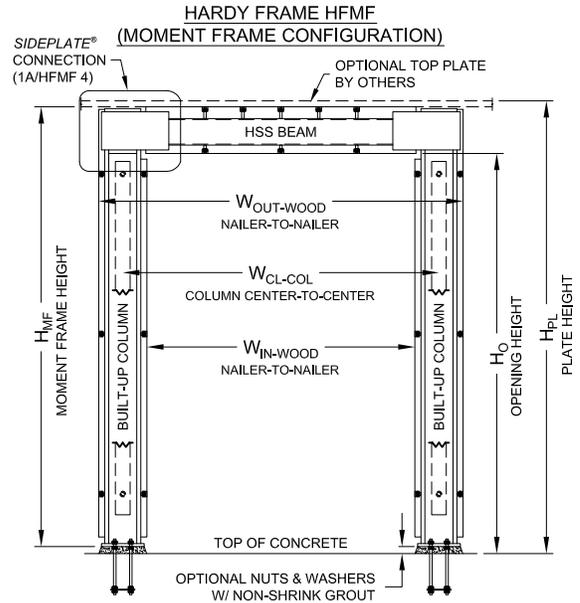
FOUNDATION DESIGN, FOOTINGS AND STEM WALLS SHALL BE DESIGNED BY THE ENGINEER OF RECORD

Notes: 1. Anchors are designed per AISC 341-10 and ACI 318 Appendix D based on f<sub>c</sub>=2500 psi, f<sub>u</sub>=60,000 psi and f<sub>y</sub>=40,000 psi (min)  
 2. For alternate shear transfers or pull-out resistance, calculations shall be supplied by the Engineer of Record

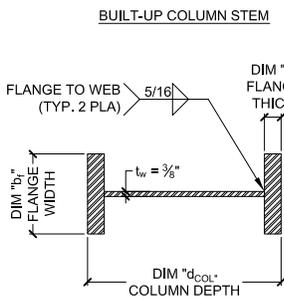
**Refer to the MiTek® Hardy Frame® Moment Frame Catalog and Installation Details for more specific information**

FRAME CONFIGURATIONS AND GEOMETRY						
MODEL NUMBER	BU COLUMN	HSS BEAM	W <sub>CL-COL</sub> (min)	W <sub>CL-COL</sub> (max)	H <sub>O</sub> (max)	H <sub>PL</sub>
HFMF611	BU6.5x33	HSS6x4x3/8	8'-2 1/2"	17'-1 1/2"	8'-11 1/4"	10'-0 3/4"
HFPIC611	BU6.5x33	HSS6x4x3/8	8'-2 1/2"	17'-1 1/2"	8'-11 1/4"	10'-0 3/4"
HFMF811	BU8.5x59	HSS6x6x5/8	8'-4 1/2"	15'-3 1/2"	12'-11 1/4"	14'-0 3/4"
HFPIC811	BU8.5x59	HSS6x6x5/8	8'-4 1/2"	15'-3 1/2"	12'-11 1/4"	14'-0 3/4"
HFMF813	BU8.5x59	HSS8x6x1/2	15'-4 1/2"	25'-3 1/2"	12'-9 1/4"	14'-0 3/4"
HFPIC813	BU8.5x59	HSS8x6x1/2	15'-4 1/2"	25'-3 1/2"	12'-9 1/4"	14'-0 3/4"
HFMF1013	BU10.5x61	HSS8x6x1/2	8'-6 1/2"	15'-5 1/2"	12'-9 1/4"	14'-0 3/4"
HFPIC1013	BU10.5x61	HSS8x6x1/2	8'-6 1/2"	15'-5 1/2"	12'-9 1/4"	14'-0 3/4"
HFMF1014	BU10.5x61	HSS8x6x5/8	15'-6 1/2"	25'-5 1/2"	12'-8 1/4"	14'-0 3/4"
HFPIC1014	BU10.5x61	HSS8x6x5/8	15'-6 1/2"	25'-5 1/2"	12'-8 1/4"	14'-0 3/4"
HFMF1214	BU12.5x64	HSS8x6x5/8	8'-8 1/2"	15'-7 1/2"	12'-8 1/4"	14'-0 3/4"
HFPIC1214	BU12.5x64	HSS8x6x5/8	8'-8 1/2"	15'-7 1/2"	12'-8 1/4"	14'-0 3/4"
HFMF1216	BU12.5x64	HSS10x6x1/2	15'-8 1/2"	25'-7 1/2"	12'-6 1/4"	14'-0 3/4"
HFPIC1216	BU12.5x64	HSS10x6x1/2	15'-8 1/2"	25'-7 1/2"	12'-6 1/4"	14'-0 3/4"
HFMF1416	BU14.5x66	HSS10x6x1/2	9'-10 1/2"	15'-9 1/2"	12'-6 1/4"	14'-0 3/4"
HFPIC1416	BU14.5x66	HSS10x6x1/2	9'-10 1/2"	15'-9 1/2"	12'-6 1/4"	14'-0 3/4"
HFMF1416	BU14.5x66	HSS10x6x5/8	15'-10 1/2"	25'-9 1/2"	12'-6 1/4"	14'-0 3/4"
HFPIC1416	BU14.5x66	HSS10x6x5/8	15'-10 1/2"	25'-9 1/2"	12'-6 1/4"	14'-0 3/4"

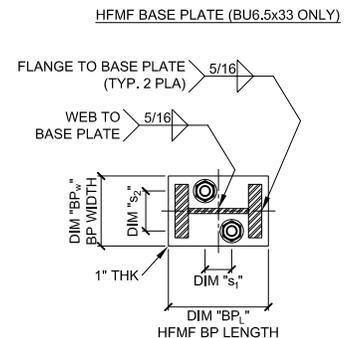
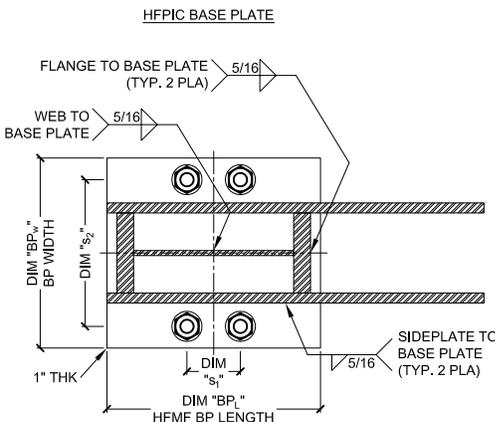
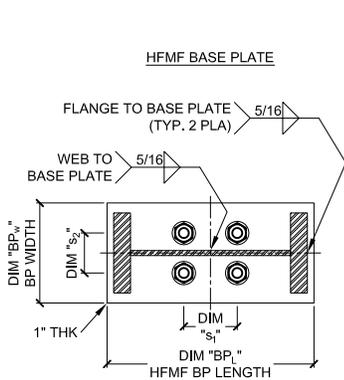
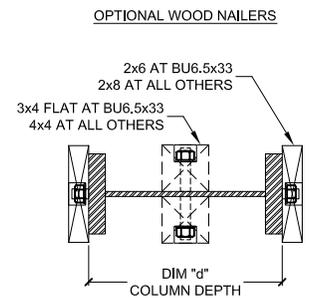
- NOTES:
- FINAL FRAME DIMENSIONS MAY BE ADJUSTED TO FIELD-SPECIFIC CONDITIONS. ANY CHANGE EXCEEDING THE NOMINAL HEIGHT OR SPAN FOR THE MODEL NUMBER SPECIFIED REQUIRES REVIEW AND APPROVAL BY THE ENGINEER OF RECORD PRIOR TO FRAME FABRICATION.
  - CUSTOM DESIGNS AVAILABLE FOR FRAMES EXCEEDING THE OVERALL LIMITATIONS OF THE MINIMUM AND MAXIMUM DIMENSIONS SHOWN ABOVE.
  - BU DESIGNATES BUILT-UP COLUMN. REFER TO 1/HFMF2 FOR COLUMN SECTION PROPERTIES.
  - LATERAL BEAM BRACING NOT REQUIRED FOR ANY MODEL AT THE SPANS SHOWN ABOVE.
  - W<sub>IN-WOOD</sub> AND W<sub>OUT-WOOD</sub> ASSUMED MIN 2x NAILER ATTACHED ON STEEL COLUMN FLANGES.



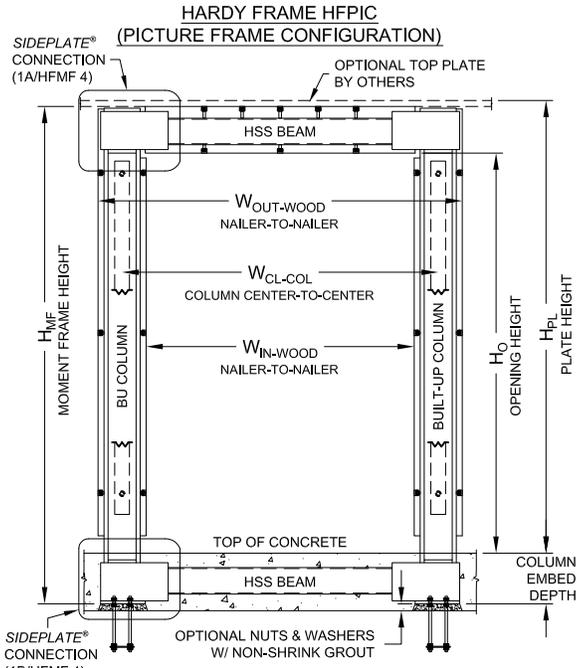
FRAME CONFIGURATIONS AND GEOMETRY



COLUMN & BASE PLATE SECTION PROPERTIES								
COLUMN SECTION	FRAME TYPE	d <sub>COL</sub>	b <sub>f</sub>	t <sub>f</sub>	BP <sub>L</sub>	BP <sub>w</sub>	s <sub>1</sub>	s <sub>2</sub>
BU6.5x33	HFMF	6 1/2"	4"	1"	7 1/2"	5 1/4"	2"	3"
	HFPIC	6 1/2"	4"	1"	8"	11 1/4"	3"	8 1/2"
BU8.5x59	HFMF	8 1/2"	6"	1 1/4"	9 1/2"	7 1/2"	3"	3"
	HFPIC	8 1/2"	6"	1 1/4"	10"	14 1/4"	4"	11"
BU10.5x61	HFMF	10 1/2"	6"	1 1/4"	11 1/2"	7 1/2"	4"	3"
	HFPIC	10 1/2"	6"	1 1/4"	12"	14 1/4"	4"	11"
BU12.5x64	HFMF	12 1/2"	6"	1 1/4"	13 1/2"	7 1/2"	4"	3"
	HFPIC	12 1/2"	6"	1 1/4"	14"	14 1/4"	4"	11"
BU14.5x66	HFMF	14 1/2"	6"	1 1/4"	15 1/2"	7 1/2"	4"	3"
	HFPIC	14 1/2"	6"	1 1/4"	16"	14 1/4"	4"	11"



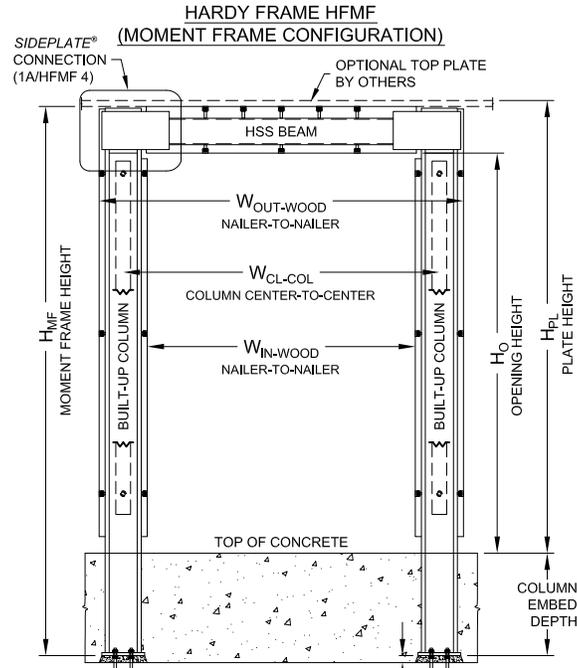
COLUMN & BASE PLATE SECTIONS



**PICTURE FRAME NOMENCLATURE:**

HFPC 14 10 - 24 x 14

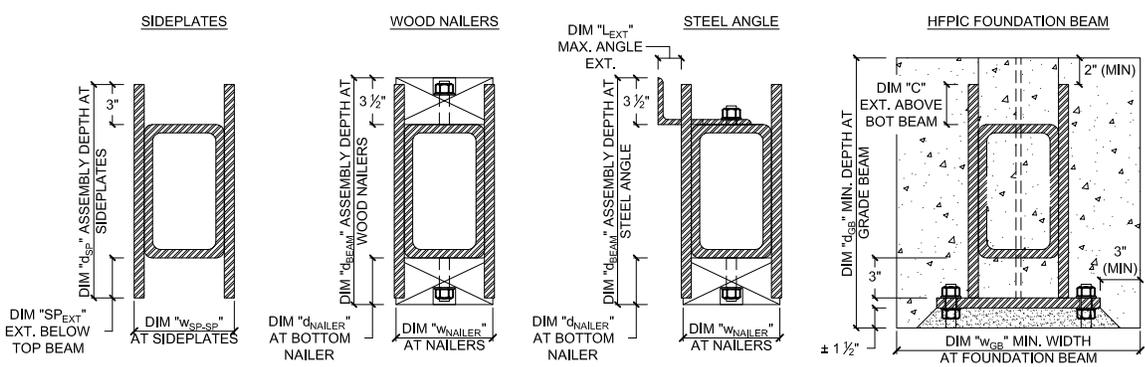
- NOMINAL PLATE HEIGHT (FT)
- NOMINAL OPENING WIDTH (FT)
- SIDEPLATE DEPTH (IN)
- NOMINAL COLUMN DEPTH (IN)
- PICTURE FRAME CONFIGURATION
- HARDY FRAME SMF



**FIXED BASE NOMENCLATURE:**

HFMF 14 10 - 24 x 14 FB

- FIXED BASE
- NOMINAL PLATE HEIGHT (FT)
- NOMINAL OPENING WIDTH (FT)
- SIDEPLATE DEPTH (IN)
- NOMINAL COLUMN DEPTH (IN)
- MOMENT FRAME CONFIGURATION
- HARDY FRAME SMF



HEADER BEAM & FOUNDATION BEAM SECTION PROPERTIES											
BEAM SECTION	FRAME TYPE	d <sub>SP</sub>	w <sub>SP-SP</sub>	SP <sub>EXT</sub>	d <sub>BEAM</sub> w/ NAILER	w <sub>NAILER</sub>	d <sub>NAILER</sub>	d <sub>BEAM</sub> w/ ANGLE	L <sub>EXT</sub>	d <sub>GB</sub>	w <sub>GB</sub>
HSS6x4x3/8	HFMF	11"	5"	2"	12"	5 1/2"	2 1/2"	12"	1 1/4"	N/A	N/A
	HFPC									15 1/2"	17 3/4"
HSS6x6x5/8	HFMF	11"	7 1/2"	2"	12"	7 1/4"	2 1/2"	12"	1 3/4"	N/A	N/A
	HFPC									15 1/2"	20 1/4"
HSS8x6x1/2	HFMF	13"	7 1/2"	2"	14"	7 1/4"	2 1/2"	14"	1 3/4"	N/A	N/A
	HFPC									17 1/2"	20 1/4"
HSS8x6x5/8	HFMF	14"	7 1/2"	3"	15"	7 1/4"	3 1/2"	15"	1 3/4"	N/A	N/A
	HFPC									18 1/2"	20 1/4"
HSS10x6x1/2	HFMF	16"	7 1/2"	3"	17"	7 1/4"	3 1/2"	17"	1 3/4"	N/A	N/A
	HFPC									20 1/2"	20 1/4"
HSS10x6x5/8	HFMF	16"	7 1/2"	3"	17"	7 1/4"	3 1/2"	17"	1 3/4"	N/A	N/A
	HFPC									20 1/2"	20 1/4"

HEADER BEAM & FOUNDATION BEAM SECTIONS

**MiTek USA, Inc.**  
555 S. Promenade Ave.,  
Suite 104, Corona, CA 92879  
(805) 477-0793 / www.hardyframe.com

**HARDY FRAME**

**HARDY FRAME® SPECIAL MOMENT FRAME**

TYPICAL INSTALLATION DETAILS

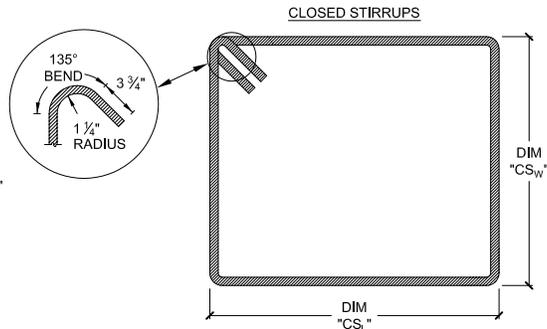
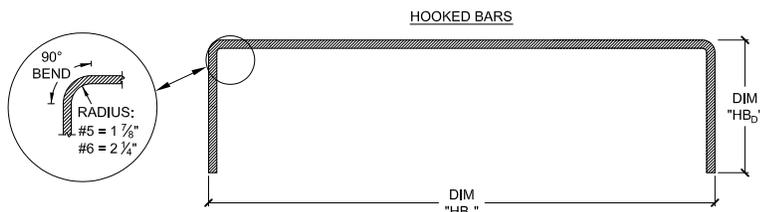
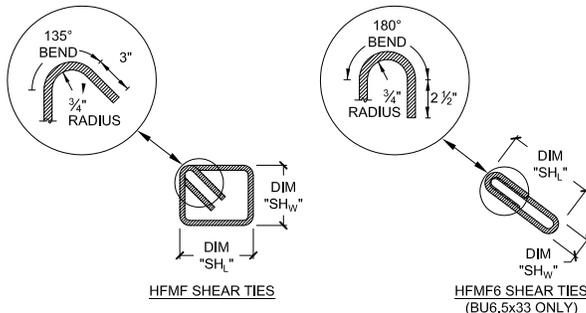
FRAME GEOMETRY & CONFIGURATIONS

REVISIONS	DATE

DATE:  
08-01-18

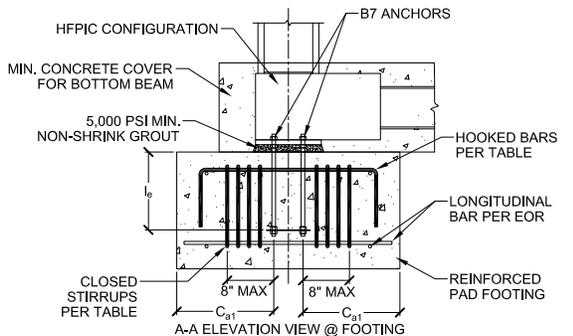
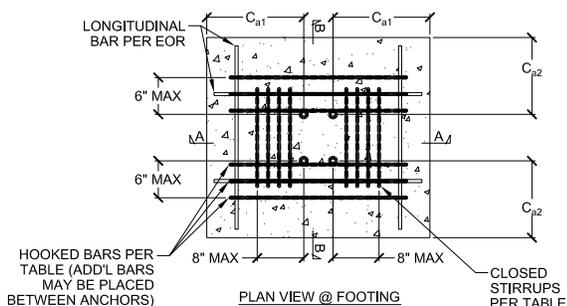
**HFMF**  
1

REINFORCEMENT PARAMETERS							
COLUMN SECTION	FRAME TYPE	SHEAR TIES		CLOSED STIRRUPS		HOOKED BARS	
		SH <sub>L</sub>	SH <sub>W</sub>	CS <sub>L</sub>	CS <sub>W</sub>	HB <sub>L</sub>	HB <sub>D</sub>
BU6.5x33	HFMF	5 7/8"	2 1/4"	N/A	N/A	N/A	N/A
	HFPIC	N/A	N/A	17"		29 3/4"	10 1/2"
BU8.5x59	HFMF	5 1/4"	5 1/4"	17"		29 3/4"	10 1/2"
	HFPIC	N/A	N/A	19"		34"	12 1/2"
BU10.5x61	HFMF	6 1/4"	5 1/4"	17"	18"	30 3/4"	10 1/2"
	HFPIC	N/A	N/A	19"		35"	12 1/2"
BU12.5x64	HFMF	6 1/4"	5 1/4"	17"		30 3/4"	10 1/2"
	HFPIC	N/A	N/A	19"		35"	12 1/2"
BU14.5x66	HFMF	6 1/4"	5 1/4"	17"		30 3/4"	10 1/2"
	HFPIC	N/A	N/A	19"		35"	12 1/2"

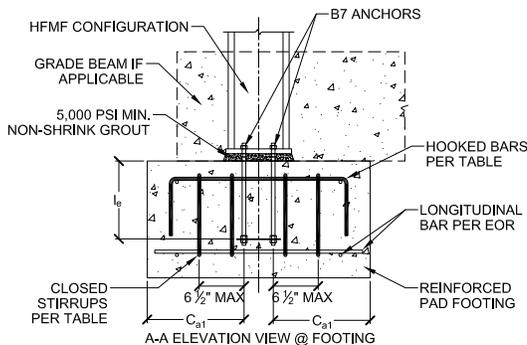
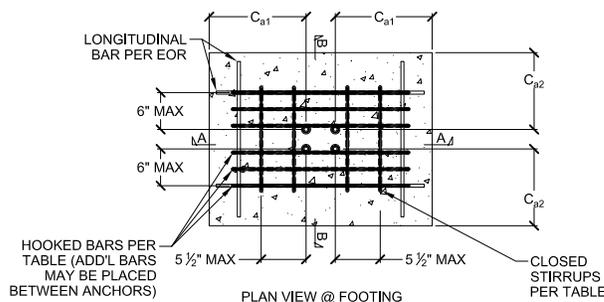


ANCHORAGE REINFORCEMENT

2

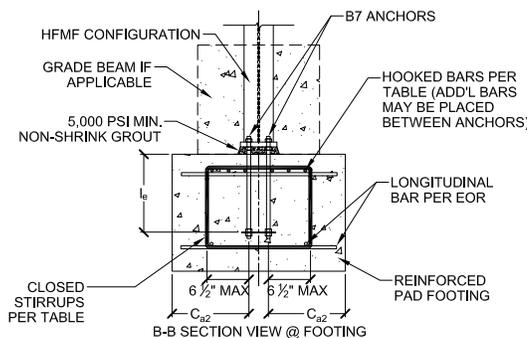
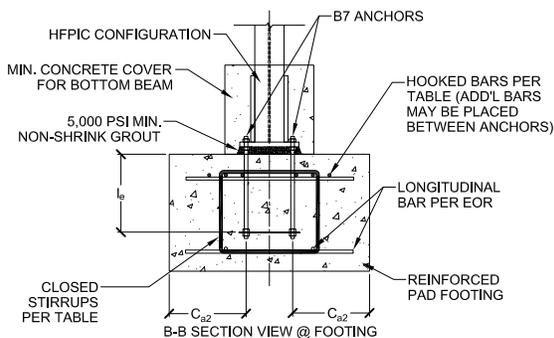


HFPIC ANCHORAGE AT FOOTING



HFMF ANCHORAGE AT FOOTING

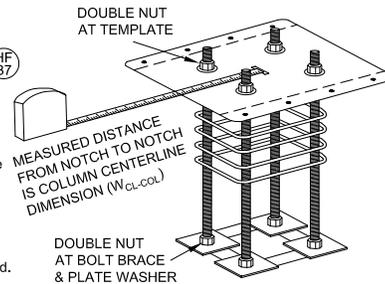
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ANCHORAGE & TEMPLATE KITS <sup>1,2,3,9,10</sup>												
COLUMN SECTION	FRAME TYPE	ANCHORAGE			TOP OF CONCRETE			CONCRETE FOOTING				
		QTY-DIA <sup>4</sup>	PLATE WASHER	MIN END DIST	MIN EDGE DIST	SHEAR TIES <sup>5,6</sup>	EMBED DEPTH, $l_e$	END DIST, $C_{e1}$	EDGE DIST, $C_{e2}$	CLOSED STIRRUPS <sup>7</sup>	HOOKED BARS <sup>8</sup>	
BU6.5x33	HFMF	2 - 3/4"	N/A	2 3/4"	2 1/4"	#3 @ 3" o.c.	18"	27"	21"	N/A	N/A	
	HFPIK	4 - 1 1/2"	N/A	N/A	N/A	N/A				4-#5	4-#5	
BU8.5x59	HFMF	4 - 3/4"	N/A	3 1/4"	2 1/4"	#3 @ 3" o.c.				4-#5	4-#5	
	HFPIK	4 - 1 1/2"	1/2"x3"x3"	N/A	N/A	N/A				8-#5	6-#6	
BU10.5x61	HFMF	4 - 3/4"	1/2"x3"x3"	3 3/4"	2 1/4"	#3 @ 3" o.c.				4-#5	6-#5	
	HFPIK	4 - 1 1/2"	1/2"x3"x3"	N/A	N/A	N/A				8-#5	8-#6	
BU12.5x64	HFMF	4 - 3/4"	1/2"x3"x3"	4 3/4"	2 1/4"	#3 @ 3" o.c.				5-#5	6-#5	
	HFPIK	4 - 1 1/2"	1/2"x3"x3"	N/A	N/A	N/A				8-#5	8-#6	
BU14.5x66	HFMF	4 - 3/4"	1/2"x3"x3"	5 3/4"	2 1/4"	#3 @ 3" o.c.				4-#5	8-#5	
	HFPIK	4 - 1 1/2"	1/2"x3"x3"	N/A	N/A	N/A				8-#5	10-#6	

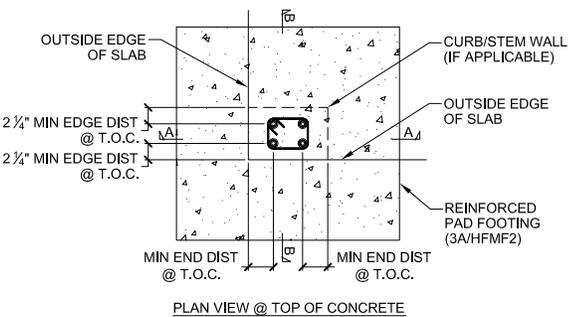
**NOTES:**

- Dimensions provided are the minimum requirement to satisfy pullout and shear transfer. Foundation, stem wall, and grade beam design by the engineer of record.
- Anchorage is designed per AISC 341-10 and ACI 318-14 Chapter 17 assuming  $f_c = 2,500$  psi, min.
- Anchorage to shallow podium slabs or to existing concrete shall be designed by the engineer of record.
- Anchor rods provided by MiTek-Hardy Frame comply with ASTM A193 Gr. B7 (or equal) and are stamped on both ends.
- Unless frame is sitting directly on pad footing, shear ties will be required.
- The number of shear ties should be determined based on the curb/stem wall/pedestal height and following the maximum spacing. In any case, at least 4 shear ties should be provided with min of 1 shear tie in the pad footing.
- Closed stirrups are for transferring tension from anchorage to the concrete. See table for size and number per column.
- Hooked bars are for transferring shear from anchorage to the concrete. See table for size and number per column.
- Anchorage is designed assuming using Hardy Frame Template Kits. For alternate anchorage designs, calculations shall be supplied by the engineer of record.
- Hardy Frame Moment Frame Template Kits include the following accessories (see illustration for complete assembly):
  - 2-Templates (HFMF-T)
  - 2-Bolt Braces (HFMF-BB)
  - 5-#3 Grade 60 Shear Ties
  - 8-Anchor rods (4 for HFMF6) w/ 2 ea. Hardened Washers, 4 ea. Heavy Hex Nuts, & 1 ea. 3"x3"x1/2" plate washer per rod.

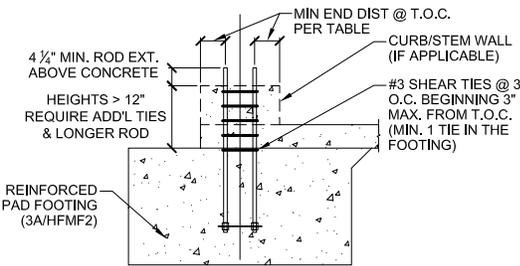


**ANCHORAGE REQUIREMENTS**

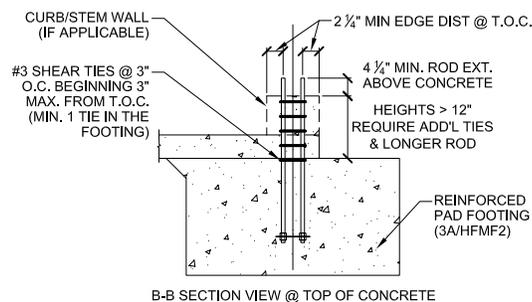
1



PLAN VIEW @ TOP OF CONCRETE



A-A ELEVATION VIEW @ TOP OF CONCRETE



B-B SECTION VIEW @ TOP OF CONCRETE

**HFMF AT TOP OF CONCRETE**

3

**ORDERING AND INSTALLATION INSTRUCTIONS**

- CALL MiTek-USA, Inc. (800) 754-3030 FOR ORDERING INFORMATION.
  - PROVIDE THE FOLLOWING INFORMATION FOR PRICING AND ORDERING:
    - JOB NAME, DELIVERY ADDRESS AND REQUESTED DELIVERY DATE
    - MODEL NUMBER AND TRACKING NUMBER (TRACKING NUMBERS APPLY TO NON-STANDARD MOMENT FRAMES ONLY)
    - ORDER QUANTITY FOR EACH MODEL NUMBER
- JOBSITE CONDITIONS
  - CONSIDER JOBSITE ACCESS FOR UNLOADING, LOCATING AND INSTALLING PRE-ASSEMBLED MOMENT FRAMES
  - DETERMINE EQUIPMENT NEEDED TO UNLOAD AND INSTALL PRE-ASSEMBLED MOMENT FRAMES SUCH AS FORKLIFT, CRANE, ETC.
- ORDER HARDY FRAME MOMENT FRAME TEMPLATE KITS (ALLOW 5-6 BUSINESS DAYS LEAD TIME FOR DELIVERY)
- CONCRETE PREPARATION
  - DETERMINE LOCATION AND LAYOUT OF TEMPLATES AND MOMENT FRAMES PER PLANS
  - INSTALL TEMPLATES AND EMBED ANCHORS PER PLAN DETAILS. REFER TO INSTALLATION INSTRUCTIONS FOR CORRECT TEMPLATE ORIENTATION, ROD ASSEMBLIES, ROD HEIGHT ABOVE CONCRETE AND TEMPLATE SPACING FOR FINISH FRAME WIDTH
  - SLOTTED HOLES ARE PROVIDED IN TEMPLATES FOR PULLING THE COLUMN CENTERLINE WIDTH ( $W_{col}$ ). PRIOR TO POURING CONCRETE CONFIRM THE SLOT TO SLOT DIMENSION CORRESPONDS TO THE CORRECT  $W_{col}$  DIMENSION FOR THE MOMENT FRAME MODEL NUMBER BEING INSTALLED.
- MOMENT FRAME INSTALLATION
  - INSTALL BOTTOM (LEVELING) NUT AND WASHER ON ALL ANCHORS.
  - AT ONE ANCHOR SET TOP OF WASHER TO BE 1-1/2 INCH ABOVE TOP OF FINISH CONCRETE. USE A LEVELING DEVICE (HAND HELD LASER RECOMMENDED) TO SET THE OTHER LEVELING NUTS AND WASHERS TO ASSURE THE FRAME WILL BE INSTALLED LEVEL AND PLUMB.
  - LIFT AND PLACE THE MOMENT FRAME ONTO THE ANCHORS ONE COLUMN AT A TIME. THE COLUMNS WILL FLEX SLIGHTLY TO ALLOW SETTING THE SECOND COLUMN.
  - INSTALL WASHERS AND NUTS ABOVE THE BASE PLATES AND FINGER TIGHTEN.
  - VERIFY THE COLUMNS ARE PLUMB, THE FRAME IS IN THE WALL PLANE AND THE HEADER IS LEVEL. MAKE NECESSARY ADJUSTMENTS BY RAISING OR LOWERING THE LEVELING NUTS BELOW THE BASE PLATES.
  - WHEN FIT AND ALIGNMENT MEET FRAMERS APPROVAL TIGHTEN ALL NUTS UNTIL "SNUG TIGHT".
  - BRACE THE INSTALLED MOMENT FRAME IN THE OUT OF PLANE DIRECTION AND RE-CHECK FOR PLUMB.
  - MAKE TOP CONNECTIONS PER PLANS AND SPECIFICATIONS.
  - INSTALL HIGH STRENGTH NON-SHRINK GROUT BELOW BASE PLATES PER DETAILS AND INSTALLATION INSTRUCTIONS.

**RECOMMENDED INSTALLATION TOOLS**

- MOMENT FRAME TEMPLATES ON HAND TO CHECK EMBED SPACING
- HAND HELD LASER AND STANDARD LEVEL (3' TO 4')
- ONE OR TWO 16"-18" CRESCENT WRENCHES
- ELECTRIC IMPACT WRENCH OR HAND RATCHET WRENCH
- IMPACT 1-1/8" SOCKETS FOR PLAIN NUTS AT 3/4" ANCHORS
- SOCKET EXTENSION AND U-JOINT (SWIVEL)
- THREAD CHASERS FOR EMBED BOLTS IN CASE THREADS ARE DAMAGED

**GENERAL NOTES**

A

**MiTek USA, Inc.**  
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**HARDY FRAME**

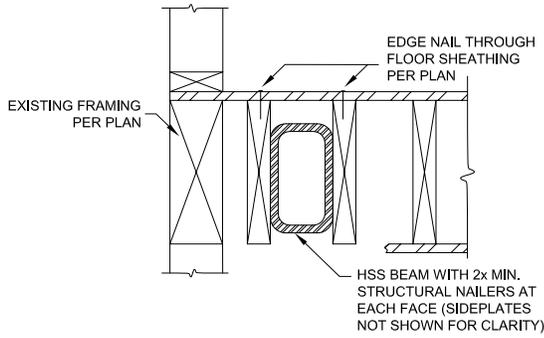
**HARDY FRAME® SPECIAL MOMENT FRAME**

TYPICAL INSTALLATION DETAILS  
FRAME ANCHORAGE & SECTION PROPERTIES

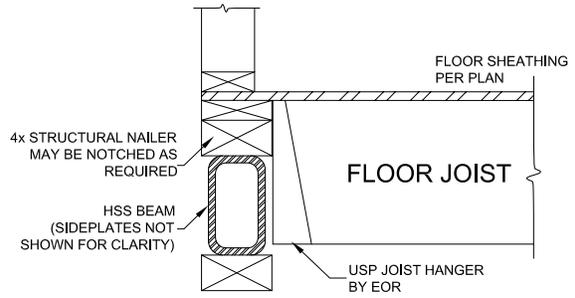
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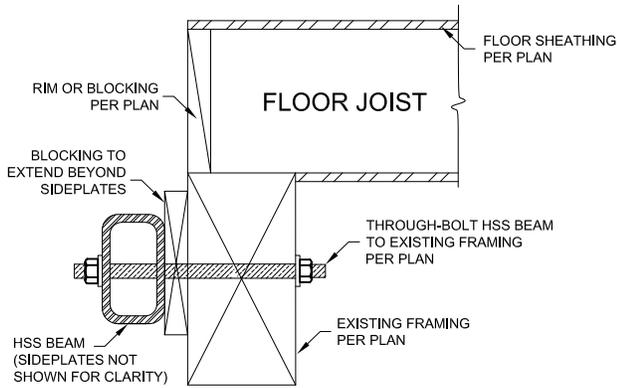
**HFMF**  
**2**



EDGE NAILING AT BEAM FACE NAILERS 4



SECTION AT HEADER W/ HANGING JOISTS 3



THROUGH-BOLT AT HSS BEAM 7

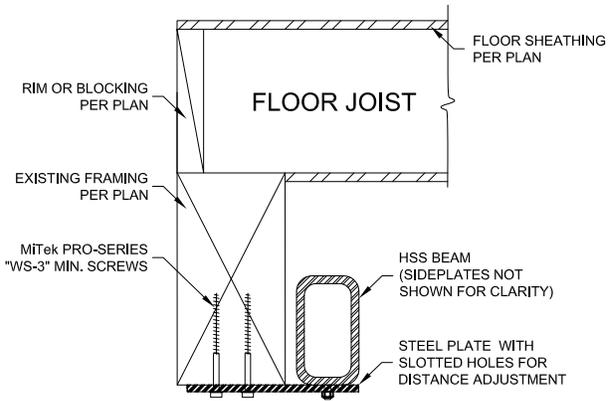
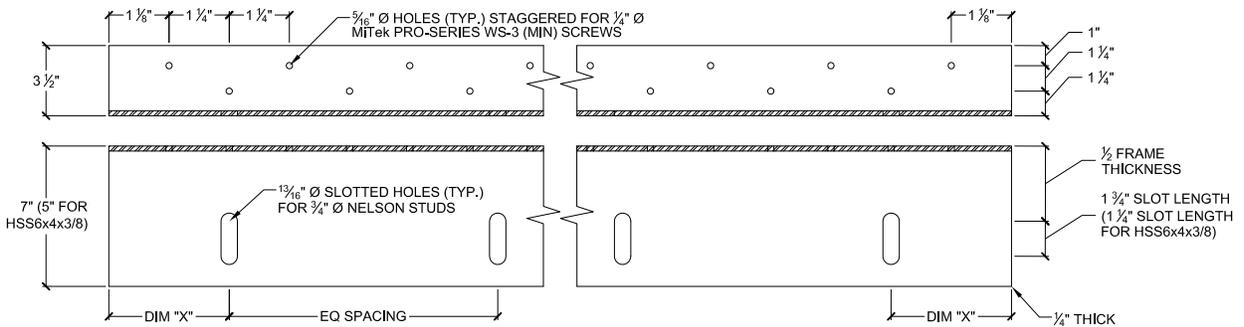
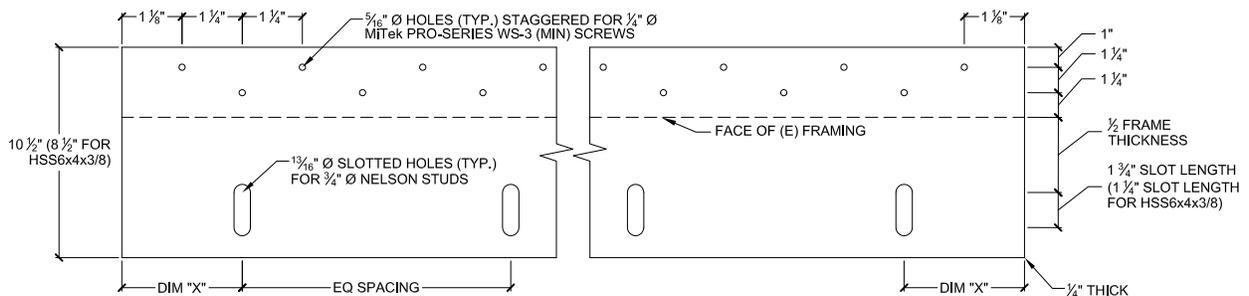


PLATE AT BOTTOM BEAM 6



STEEL ANGLE 9A



STEEL PLATE 9B



## HARDY FRAME<sup>®</sup> SPECIAL MOMENT FRAME - GENERAL NOTES

### GENERAL REQUIREMENTS

- REFERENCED DOCUMENTS: THE DESIGN, FABRICATION AND QUALITY ASSURANCE OF THE HARDY FRAME SPECIAL MOMENT FRAME SYSTEM COMPLIES WITH THE FOLLOWING:
  - INTERNATIONAL BUILDING CODE (IBC) - 2012 & 2015
  - PREQUALIFIED CONNECTIONS FOR SPECIAL MOMENT FRAMES FOR SEISMIC APPLICATIONS (AISC 358s2-14 & AISC 358-16, CH. 11)
  - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (AISC 360-10 & AISC 360-16)
  - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS (AISC 341-10 & AISC 341-16)
  - AMERICAN WELDING SOCIETY D1.1 2015 STRUCTURAL WELDING CODE-STEEL (AWS D1.1 & D1.8)
- ALPHA AND NUMERIC DESIGNATORS (#) & (##) USED HEREIN TO SIMPLIFY THE IDENTIFICATION OF PLATES AND WELDS, RESPECTIVELY. DESIGNATORS ARE DEFINED BELOW (REFER TO DETAIL 1/HFMF 4):
  - [A] SIDE PLATES, PARALLEL TO WEB OF COLUMN, CONNECTING BEAM TO COLUMN.
  - [D] HORIZONTAL SHEAR PLATE
  - {1} FILLET WELD CONNECTING SIDE PLATE [A] TO HORIZONTAL SHEAR PLATE [D]
  - {2} FILLET WELD CONNECTING INSIDE FACE OF SIDE PLATE [A] TO FLANGE TIPS OF W-COLUMN
  - {3} FILLET WELD CONNECTING INTERIOR EDGES OF HORIZONTAL SHEAR PLATE [D] TO FACES OF FLANGES AND WEB OF W-COLUMN
  - {6} FILLET WELD CONNECTING SIDE WALL OF HSS BEAM TO SIDE PLATE [A]
  - {7} HORIZONTAL FLARE-BEVEL WELD CONNECTING HSS BEAM RADIUS TO SIDE PLATE [A]

### MATERIAL

- MATERIAL:
  - MOMENT CONNECTION PLATE AND BUILT-UP COLUMN PLATE MATERIAL MEETS THE REQUIREMENTS OF ASTM A572, GRADE 50
  - BASE PLATE MATERIAL MEETS THE REQUIREMENTS OF ASTM A572
  - ALL OTHER FASTENERS AND COMPONENTS MEET THE REQUIREMENTS OF ASTM A36
  - ANCHOR BOLTS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A307 (AS REQUIRED BY LOCAL JURISDICTIONS)
  - NELSON STUDS (Fy=70ksi)
  - COLUMN & BEAM WOOD NAILERS MEET THE REQUIREMENTS OF NO. 2 DOUGLAS FIR LARCH OR BETTER
- ROLLED SHAPES:
  - ROLLED SHAPES USED FOR COLUMNS MEET THE REQUIREMENTS OF ASTM A992
  - HSS SECTIONS USED FOR BEAMS MEET THE REQUIREMENTS OF ASTM A500 GRADE B
- WELD FILLER METAL:
  - THE WELD FILLER METAL AND ASSOCIATED WELDING PROCESS FOR ALL FILLET AND FLARE-BEVEL WELDS MAY BE ANY OF THE FOLLOWING, PROVIDED COMPLIANCE WITH NOTES 3.b AND 3.c BELOW IS DEMONSTRATED:
    - E70T-6, E71T-1, E71T-3 OR E70TG-K2 FOR FCAW
    - E7XT-9 FOR FLUX CORED ARC WELDING (FCAW) WITH GAS SHIELDING
    - F7A2-EXXX FOR SUBMERGED ARC WELDING (SAW)
    - E7018 STICK ELECTRODE FOR SHIELDED METAL ARC WELDING (SMAW)
 THE WELD FILLER METAL USED DEMONSTRATES AN ENERGY EQUIVALENT TO A MINIMUM CVN TOUGHNESS OF 20 FT-LBS. IMPACT STRENGTH AT A TEMPERATURE OF -20°F AND 40 FT-LBS IMPACT STRENGTH AT 70°F AS DETERMINED BY AWS CLASSIFICATION TEST METHODS OR MANUFACTURER CERTIFICATION.
  - ALL WELD FILLER METAL SATISFIES A MAXIMUM DIFFUSIBLE HYDROGEN CONTENT REQUIREMENT OF 16 MILLILITERS OF HYDROGEN PER 100 GRAMS OF WELD METAL OR LESS (H16).

FIELD WELDING (AS OCCURS FOR FILLET/FLARE BEVEL WELDS ON HSS BEAMS TO SIDE PLATES)

FIELD WELDING SHALL COMPLY FULLY WITH THE REQUIREMENTS OUTLINED IN SECTION "SHOP WELDING."

### PREPARATION

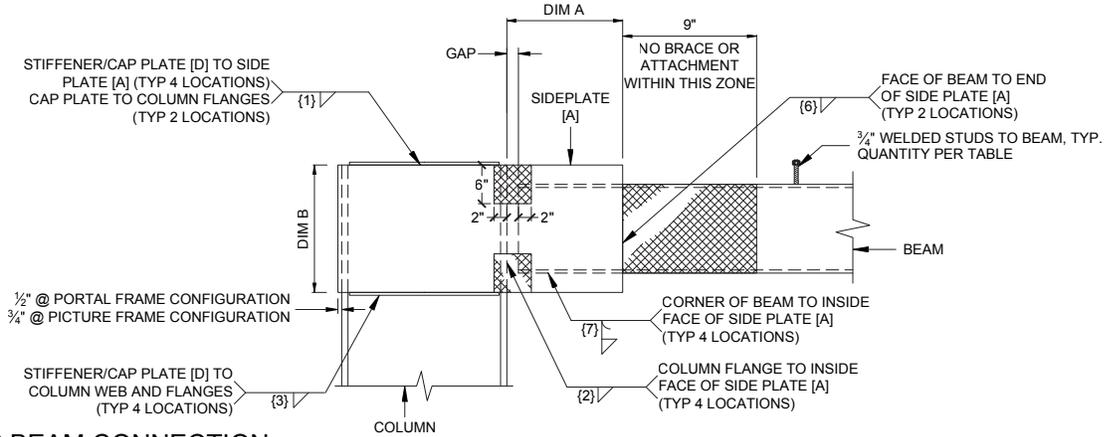
- THE FABRICATOR EMPLOYS A DISTORTION CONTROL PROGRAM TO ADDRESS CONTROL OF DISTORTION AND WELD SHRINKAGE, INCLUDING MAINTENANCE OF DIMENSIONAL ACCURACY.
- BASE METAL SURFACE PREPARATION: SURFACES ON WHICH WELD METAL IS TO BE DEPOSITED, INCLUDING BUT NOT LIMITED TO COLUMN FLANGE TIPS (I.E., COLUMN FLANGE-TO-SIDE PLATE [A] ATTACHMENT), BEAM RADII, AND THERMAL CUT EDGES ARE SMOOTH, UNIFORM, AND FREE FROM LOOSE OR THICK SCALE, SLAG, RUST, MOISTURE, GREASE AND OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
- THERMAL CUTTING:
  - THE ROUGHNESSES OF ALL THERMAL-CUT SURFACES ARE NOT GREATER THAN AN ANSI SURFACE ROUGHNESS VALUE OF 1000 MICRO-INCHES. ROUGHNESS EXCEEDING THIS VALUE, AND NOTCHES OR GOUGES NOT MORE THAN 3/16 INCH DEEP, ON OTHERWISE SATISFACTORY SURFACES ARE REMOVED BY MACHINING OR GRINDING.
  - FLAME CUT SURFACES ARE FREE OF GLOBULES AND LOOSE SLAG. THE THERMAL CUTTING EQUIPMENT IS SO ADJUSTED AND MANIPULATED AS TO AVOID CUTTING BEYOND (INSIDE) THE PRESCRIBED LINES.
  - THERMAL CUTTING PROCESSES ARE LIMITED TO PLASMA ARC-CUTTING OR OXYFUEL GAS PROCESSES.

### QUALITY CONTROL

- MiTek-USA, INC. OR THEIR SUBCONTRACTORS ARE RESPONSIBLE FOR QUALITY CONTROL AND PROVIDE IN-PROCESS VISUAL INSPECTION OF ALL FABRICATION ACTIVITIES TO ENSURE THAT MATERIALS AND WORKMANSHIP MEET THE REQUIREMENTS OF THE DESIGN. QC INSPECTION INCLUDES HOLD POINTS FOR POST-WELD VISUAL INSPECTION OF FILLET WELD {2} PRIOR TO INSERTION OF BEAM TO VERIFY WELD INTEGRITY. AS OCCURS, FIELD WELDING QUALITY CONTROL IS THE RESPONSIBILITY OF THE PURCHASER (SEE "UT INSPECTION" SECTION).

### SHOP WELDING

- WELDER QUALIFICATION: THE PERFORMANCES OF ALL WELDERS, WELDING OPERATORS AND TACK WELDERS ARE QUALIFIED IN CONFORMANCE WITH AWS D1.1, SECTION 4, PART C TO DEMONSTRATE ABILITY TO PRODUCE SOUND WELDS.
- WELDING PROCEDURE SPECIFICATIONS (WPS):
  - THE FABRICATION CONTRACTOR HAS PREPARED A SPECIFIC WRITTEN WPS FOR EACH DIFFERENT WELDING APPLICATION. DIFFERENT WELDING APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO, THE JOINT DETAILS AND TOLERANCES, PREHEAT AND INTERPASS TEMPERATURE, SINGLE OR MULTIPLE STRINGER PASSES, WELDING CURRENT, POLARITY, ALLOWABLE AMPERAGE RANGES, ALLOWABLE VOLTAGE RANGES, ALLOWABLE TRAVEL SPEED RANGES, ELECTRODE EXTENSION, ROOT TREATMENT, WELDING POSITION, WELDING PROCESS, ELECTRODE MANUFACTURER, FILLER METAL TRADE NAME FOR THE ELECTRODE TYPE SELECTED, AND OTHER ESSENTIAL VARIABLES AS DEFINED IN AWS D1.1 REQUIRED TO COMPLETE THE FABRICATION OF THE MOMENT FRAME(S). AMPERAGE, VOLTAGE, TRAVEL SPEED AND ELECTRODE EXTENSION ARE MAINTAINED WITHIN THE FILLER METAL MANUFACTURER'S RECOMMENDATIONS.
  - EACH WPS PREPARED IS BASED ON AND REFERENCED TO A DOCUMENTED AND APPROVED PROCEDURE QUALIFICATION RECORD (PQR).
  - THE APPROVED WPS FOR EACH APPLICABLE PRODUCTION WELD IS CLEARLY DISPLAYED TO PROVIDE READY ACCESS BY THE ASSIGNED WELDERS, WELDING SUPERVISORS AND INSPECTORS.
  - ALL WPSs ARE PREPARED BY QUALIFIED INDIVIDUALS. WPSs ARE PREPARED BY THE SAME INDIVIDUAL RESPONSIBLE FOR THE SUITABILITY OF THE WPS.
- WELDING PROCEDURE QUALIFICATION (PQR):
  - DOCUMENTED PROCEDURE QUALIFICATION RECORDS ARE MAINTAINED BY HARDY FRAMES, INC. PROCEDURE QUALIFICATION CONFORMS TO THE REQUIREMENTS OF AWS D1.1, TABLE 4.1 AND EMPLOYS THE FOLLOWING TESTING METHODS AND ACCEPTANCE CRITERIA:
    - VISUAL INSPECTION IN ACCORDANCE WITH AWS D1.1, SECTION 4.8.1.
    - RADIOGRAPHIC TESTING (RT) OR ULTRASONIC TESTING (UT) BEFORE PREPARING MECHANICAL TEST SPECIMENS, IN ACCORDANCE WITH AWS D1.1, SECTION 4.8.2.
    - MECHANICAL TESTING IN ACCORDANCE WITH AWS D1.1, SECTION 4.8.3. THE TYPE AND NUMBER OF TEST SPECIMENS, FOR EACH QUALIFIED PRODUCTION WELDING POSITION, SHALL BE PER AWS D1.1, TABLE 4.2 (1), USING A GROOVE WELD TEST PLATE PER FIGURE 4.10(2). CHARTY V-NOTCH IMPACT TESTING OF THE WELD METAL IN ACCORDANCE WITH AWS D1.1, SECTION 4.1.1.3. THE REQUIRED TEST TEMPERATURE AND ENERGY VALUE IS THAT SPECIFIED IN MATERIAL SECTION 3.b. THE TYPE AND NUMBER OF NOTCH TOUGHNESS SPECIMENS, FOR EACH QUALIFIED PRODUCTION WELDING POSITION, IS PER AWS D1.1, ANNEX III, TABLE III-1. ONE SPECIMEN MAY BE LESS THAN THE MINIMUM AVERAGE OF 20 FT-LBS., BUT NOT LESS THAN 15 FT-LBS.
  - ALL PROCEDURE QUALIFICATION TESTING IS PERFORMED BY AN INDEPENDENT CERTIFIED AND APPROVED TESTING LABORATORY.
  - IN LIEU OF THE REQUIREMENTS OF 3.a AND 3.b, A CURRENT CERTIFICATE OF CONFORMANCE PROVIDED BY THE WIRE MANUFACTURER MAY BE USED AS THE SUPPORTING PQR PROVIDED FULL COMPLIANCE IS MET FOR EVERY CONDITION OF PREQUALIFICATION FOUND IN AWS D1.1 SECTION 3 FOR PREQUALIFIED FILLET WELDS. THE SELECTION OF THIS OPTION BY THE CONTRACTOR'S FABRICATION/ERECTION SUBCONTRACTOR IS PREDICATED ON ITS ACKNOWLEDGEMENT THAT ITS CERTIFIED WELDERS ARE EXPERIENCED AND CONFIDENT IN THE USE AND SETTINGS SPECIFIED IN THE CERTIFICATE OF CONFORMANCE WITH THE ALLOWABLE TOLERANCES FOR ESSENTIAL VARIABLES FOUND IN TABLE 4.5 OF AWS D1.1.
- TACK WELDS:
  - TACK WELDS ARE SUBJECT TO THE SAME QUALITY REQUIREMENTS AS THE FINAL WELDS, INCLUDING PREHEAT AND UNDERCUT, IN ACCORDANCE WITH AWS D1.1, SECTION 5.18.2. THESE QUALITY REQUIREMENTS APPLY EQUALLY TO TACK WELDING OF BACKING STRIPS, FILLER PLATE, WELD RUN-OFF TABS, AND ANY OTHER CONSTRUCTION AIDS.
  - VERTICAL TACK WELDS BETWEEN SIDE PLATE [A] AND FLANGE EDGES OF COLUMN ARE NOT PLACED WITHIN 2 INCHES OF EACH END OF WELD {2}.
  - TACK WELDS BETWEEN SIDE PLATES [A] AND HSS BEAM ARE NOT PLACED WITHIN 2 INCHES OF EACH END OF WELD {7}.
  - ALIGNMENT CONTROL METHODS MAY INCLUDE, BUT ARE NOT LIMITED TO, TACK WELDING OF TEMPORARY ANGLE STRUTS ('DOGS') TO TOP AND BOTTOM FREE EDGES OF SIDE PLATE [A], NOT CLOSER THAN 2 INCHES FROM THE VERTICAL FREE EDGE OF SIDE PLATE [A], IN ORDER TO MAINTAIN THE NECESSARY SEPARATION DISTANCE REQUIRED TO INSTALL THE HSS BEAM.
- WELD RUN-OFF TABS ARE NOT USED FOR FILLET WELDS.
- PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS:
  - THE MINIMUM PREHEAT AND INTERPASS TEMPERATURES FOR A GIVEN THICKNESS OF BASE METAL TO BE WELDED IS DETERMINED BY AWS D1.1 TABLE 3.2.
  - PREHEAT TEMPERATURES ARE MEASURED AT A DISTANCE FROM THE WELD EQUAL TO THE THICKNESS OF THE PART BEING WELDED, BUT NOT LESS THAN THREE INCHES IN ANY DIRECTION INCLUDING THE THROUGH THICKNESS OF THE PIECE. WHERE PLATES ARE OF DIFFERENT THICKNESS, THE PREHEAT REQUIREMENT FOR THE THICKER PLATE GOVERNS. MAINTENANCE OF PREHEAT TEMPERATURE THROUGH THE EXECUTION OF THE WELD (I.E. THE INTERPASS TEMPERATURE) IS ESSENTIAL. MAXIMUM INTERPASS TEMPERATURE IS LIMITED TO 550 DEGREES FAHRENHEIT, MEASURED AT A DISTANCE NOT EXCEEDING ONE INCH FROM THE START OF THE WELD PASS. WELDING OPERATORS AND INSPECTORS ARE IN POSSESSION OF AND UTILIZING TEMPERATURE STICKS.
  - IN NO CASE, REGARDLESS OF THE WELDING PROCESS, SHALL THE PREHEAT TEMPERATURE BE LESS THAN THAT REQUIRED TO DRIVE OFF ANY SURFACE MOISTURE OR CONDENSATION WHICH MAY BE PRESENT ON THE STEEL ELEMENTS TO BE WELDED.
- ALL SLAG IS REMOVED AFTER EACH WELD PASS BEFORE WELDING OVER PREVIOUSLY DEPOSITED WELD METAL, AND THE WELD AND THE ADJACENT BASE METAL SHALL BE BRUSHED CLEAN. THIS REQUIREMENT SHALL APPLY NOT ONLY TO SUCCESSIVE LAYERS BUT ALSO TO SUCCESSIVE BEADS AND TO THE CRATER AREA WHEN WELDING IS RESUMED AFTER ANY INTERRUPTION, IN ACCORDANCE WITH AWS D1.1 SECTION 5.30.1.
- ARC STRIKES ON CONNECTION PLATES, BEAMS AND COLUMNS ARE TO BE AVOIDED.
- WELD TIE-INS ARE NOT PERMITTED
- PEENING IS NOT ALLOWED.

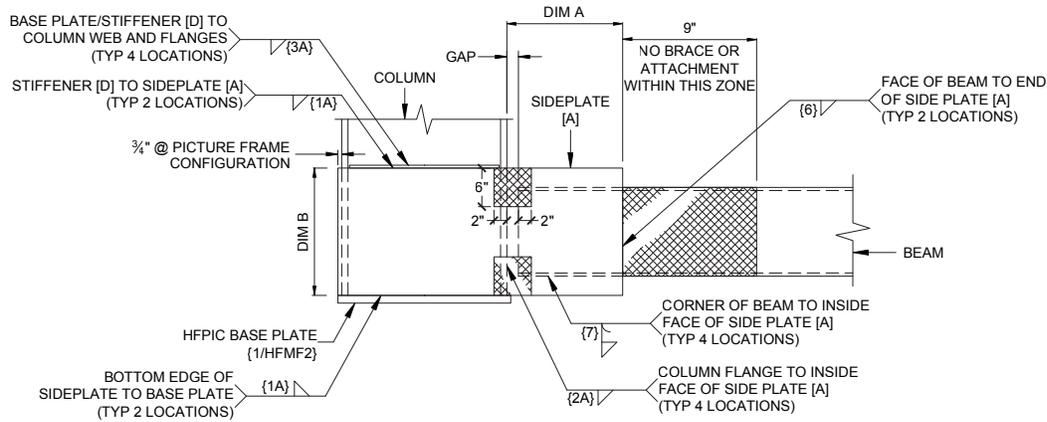


TOP BEAM CONNECTION

1A

NOTICE OF PROPRIETARY INFORMATION

The SIDEPLATE® steel frame connection information for the Hardy Frame® Moment Frame herein is PROPRIETARY information belonging to MiTek-USA, Inc., Tel. (800) 754-3030, www.hardyframe.com. The SIDEPLATE® Connection Technology is patented in the U.S.A. (U.S. Patent nos. 5,660,017, 6,138,427, 6,516,583 & 6,591,573) and other countries, with other patents applied for. Use or disclosure of this information is strictly prohibited except as authorized in writing by MiTek-USA, Inc. Violators will be prosecuted in accordance with U.S.A. and Foreign Patent and Intellectual Property Laws.



BOTTOM BEAM CONNECTION (HFPIIC CONFIGURATION ONLY)

1B

SIDEPLATE CONNECTION DESIGN PARAMETERS

MODEL NUMBER	COLUMN	PLATE THICKNESS		WELD SIZE					BEAM	GAP	DIMENSIONS		WELD SIZE		3/4" STUDS**	
		[A]	[D]	{1}	{1A}	{2}	{2A}	{3}			{3A}	A	B	{6}		{7}*
HFMF611	BU6.5x33	1/2"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS6x4x3/8	1"	8"	11"	1/4"	1/4"	6
HFPIIC611					5/16"	7/16"	3/16"									
HFMF811	BU8.5x59	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS6x6x5/8	1 1/2"	8"	11"	1/4"	1/4"	8
HFPIIC811					5/16"	7/16"	3/16"									
HFMF813	BU8.5x59	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS8x6x1/2	1 1/2"	10"	13"	1/4"	1/4"	8
HFPIIC813					5/16"	7/16"	3/16"									
HFMF1013	BU10.5x61	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS8x6x1/2	1 1/2"	10"	13"	1/4"	1/4"	10
HFPIIC1013					5/16"	7/16"	3/16"									
HFMF1014	BU10.5x61	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS8x6x5/8	1 1/2"	10"	14"	1/4"	1/4"	10
HFPIIC1014					5/16"	7/16"	3/16"									
HFMF1214	BU12.5x64	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS8x6x5/8	1 1/2"	10"	14"	1/4"	1/4"	12
HFPIIC1214					5/16"	7/16"	3/16"									
HFMF1216	BU12.5x64	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS10x6x1/2	1 1/2"	13"	16"	1/4"	1/4"	12
HFPIIC1216					5/16"	7/16"	3/16"									
HFMF1416	BU14.5x66	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS10x6x1/2	1 1/2"	13"	16"	1/4"	1/4"	14
HFPIIC1416					5/16"	7/16"	3/16"									
HFMF1416	BU14.5x66	3/4"	3/8"	1/4"	N/A	5/16"	N/A	1/4"	N/A	HSS10x6x5/8	1 1/2"	13"	16"	1/4"	1/4"	14
HFPIIC1416					5/16"	7/16"	3/16"									

\* WELD {7} IS A FLAIR-LEVEL GROOVE WELD WITH REINFORCING FILLET. SIZE IN TABLE INDICATES SIZE OF FILLET  
 \*\* STUD QTY ASSUMES ATTACHMENT TO 4x NAILER. FOR ATTACHMENT TO STEEL ANGLE OR PLATE, SEE STUD QTY PER DETAIL 5 / HFMF 3

SIDEPLATE MOMENT CONNECTION PARAMETERS

1

MiTek USA, Inc.  
 555 S. Promenade Ave.,  
 Suite 104, Corona, CA 92879  
 (855) 477-0793 / www.hardyframe.com

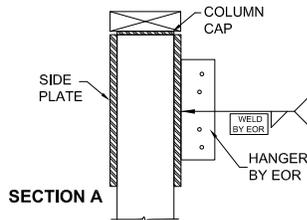
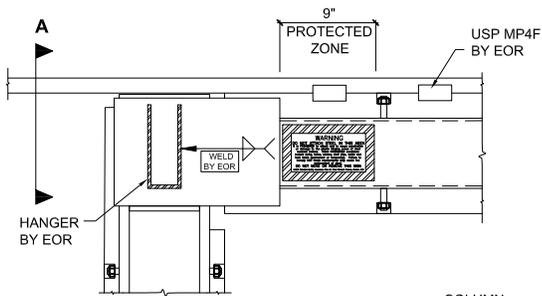


HARDY FRAME® SPECIAL MOMENT FRAME  
 TYPICAL INSTALLATION DETAILS  
 GENERAL NOTES AND SIDEPLATE CONNECTIONS

REVISIONS	DATE

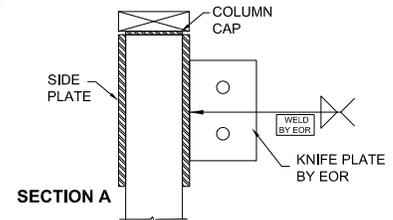
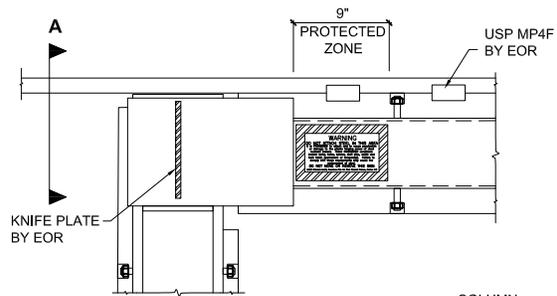
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**HFMF**  
**4**



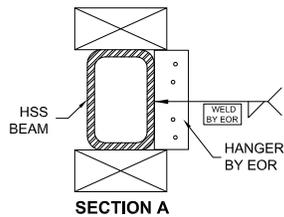
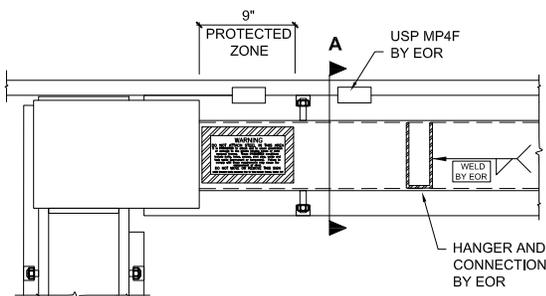
HANGER @ FACE OF SIDEPLATE FACE

4



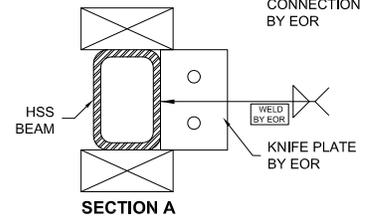
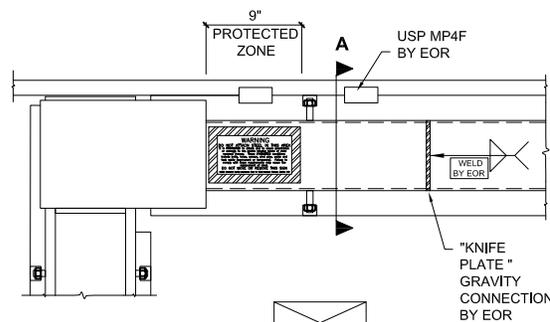
KNIFE PLATE @ FACE OF SIDEPLATE

3



HANGER @ HEADER

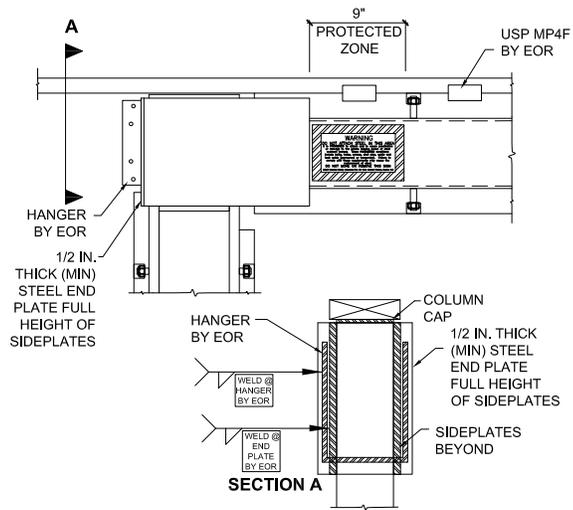
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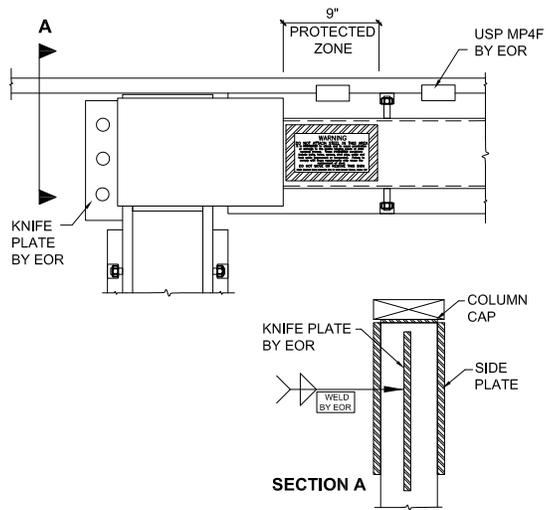
KNIFE PLATE TO HEADER

7

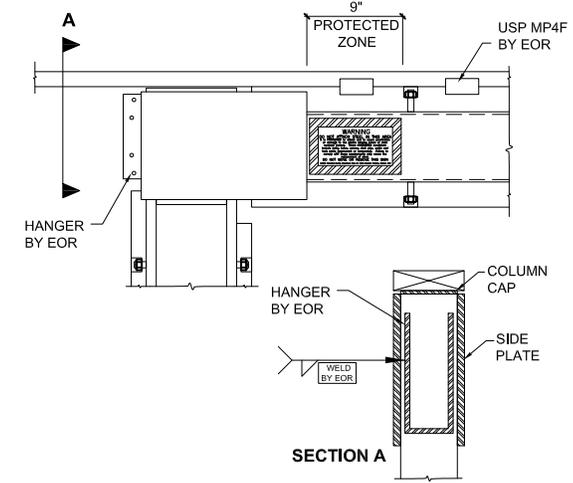
INFORMATION AND DETAILING ON THIS SHEET IS INTENDED FOR USE BY THE PROJECT DESIGN PROFESSIONAL AS ALTERNATES TO REMOVE AND REPLACE DETAILS ON SHEET HFMF 3.



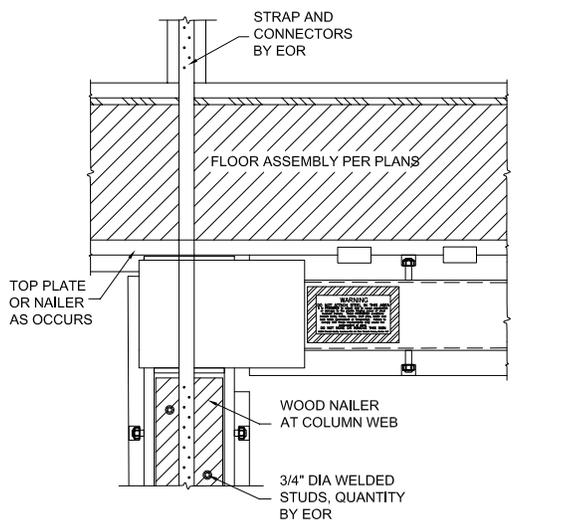
HANGER @ COLUMN TO END PLATE 2



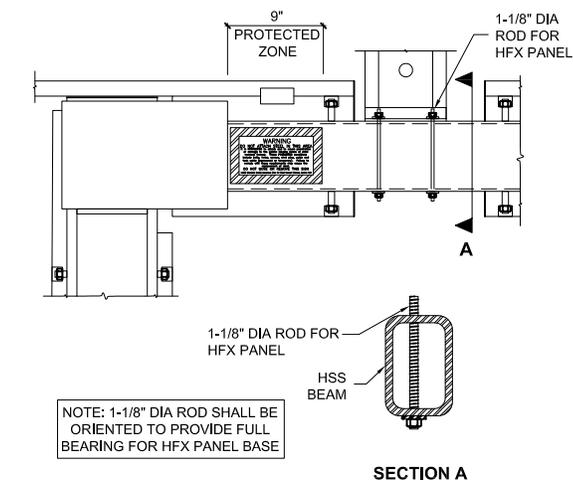
STEEL BEAM TO COLUMN FLANGE 1



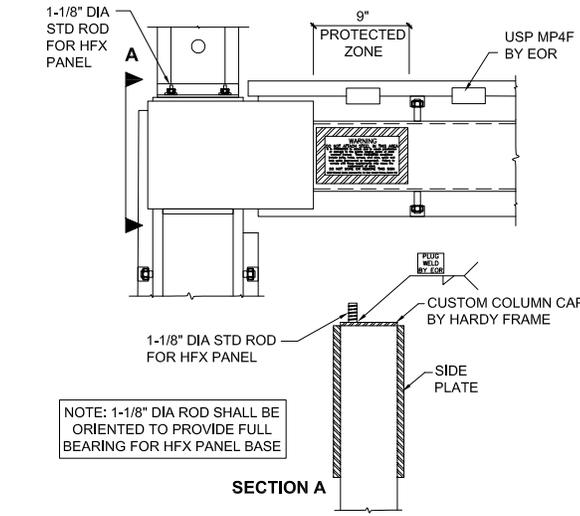
HANGER @ COLUMN FLANGE 6



HOLD DOWN STRAP TO COLUMN WEB 5



HFX PANEL @ HEADER 10



HFX PANEL @ COLUMN CAP 9

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**HARDY FRAME**

**HARDY FRAME® SPECIAL MOMENT FRAME**  
TYPICAL INSTALLATION DETAILS  
SUPPLEMENTAL CONNECTIONS & ATTACHMENTS

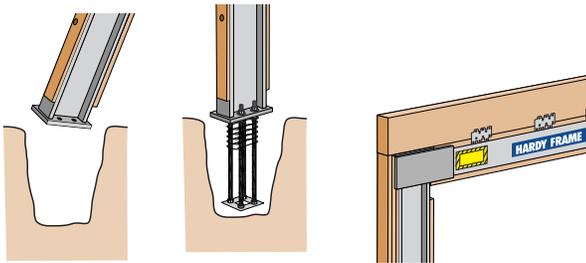
REVISIONS	DATE

DATE:  
08-01-18

**HFMF**  
**5**

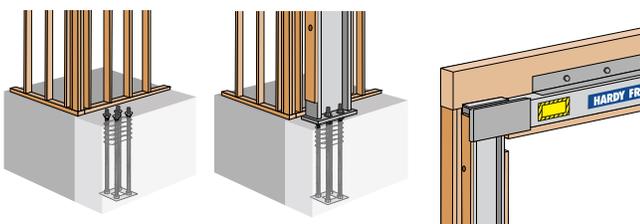
## Moment Frame Installation inside an existing wall line

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 MiTek® 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.



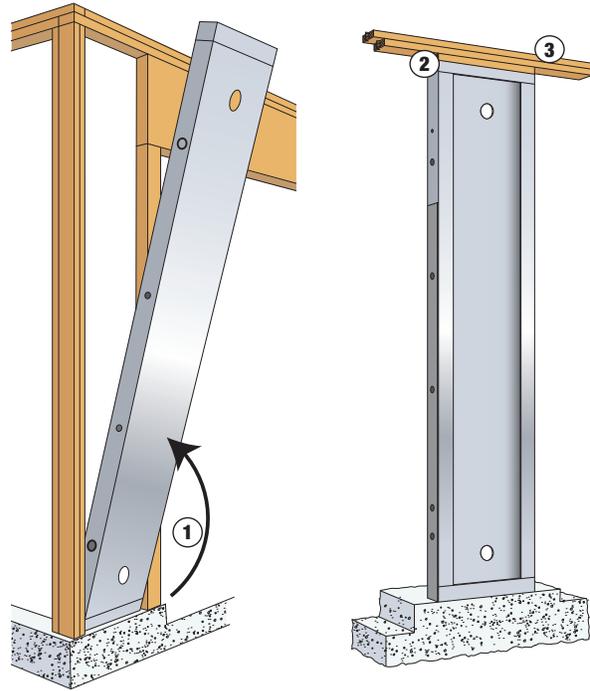
## Installation outside an existing wall line

1. Dig footing pads or grade beam per the plan.
2. Assemble the Template Kit per MiTek® 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

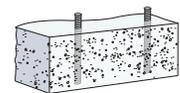
1. Tilt Panel, lift over bolts and swing into the existing space
2. Install 2x filler at 1-1/2" gap
3. Connect with 1/4 x 4-1/2 USP WS-Series Screws



## 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.

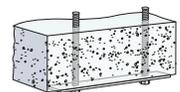
The engineer of records design will take into account concrete edge distances, end distances and the amount of combined tension and shear needed to resist the forces transferring from the MiTek® Hardy Frame® Shear Panel to the existing foundation.



Epoxy

## Thru-Bolt

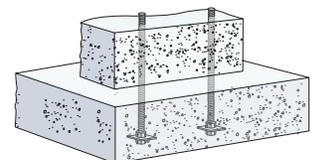
The design, including capacity of existing concrete and size of Bearing Plates below is determined by the engineer of record. The adjacent illustration shows installation with a MiTek® Hardy Frame® Bearing Plate (HFXBP) at the underside of concrete.



Thru-Bolt

## New Footing Below

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

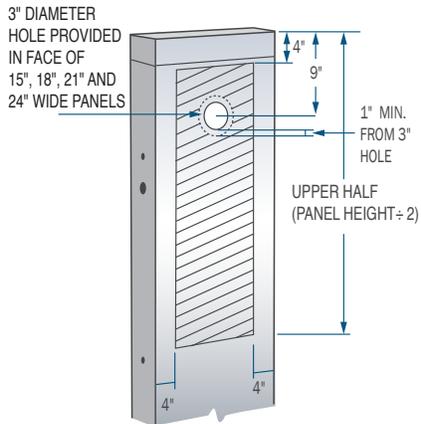


New Footing Below Existing

## 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.

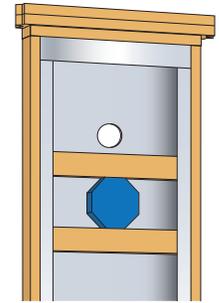
To drill more than one hole, a larger diameter hole or a hole in a location outside of the hatched area, contact MiTek Hardy Frames.



## Fixture Installation

### 2x4 Wall Framing

- There is no "inside or outside face" of MiTek® 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

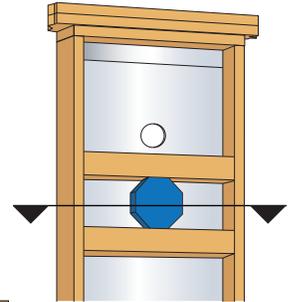


### Cavity Face

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

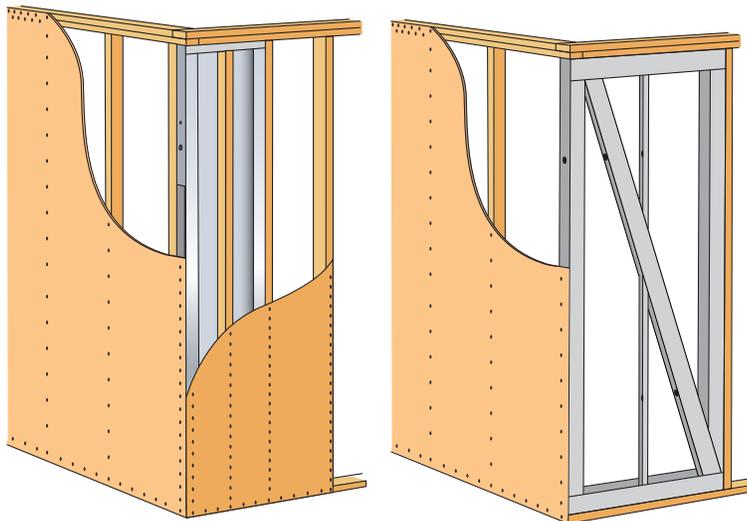
### 2x6 Wall Framing

- 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



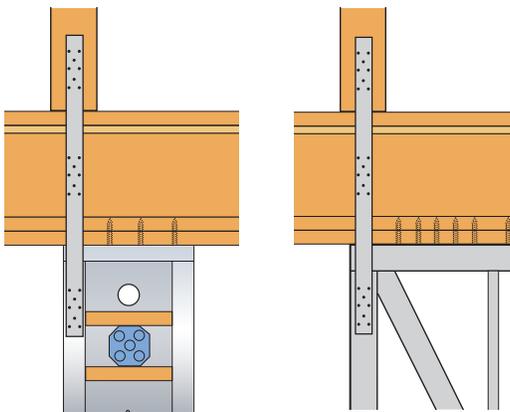
WAFER HEAD



WING TIP "SD" SELF TAPPING

## Steel

When attaching steel connectors (12-gauge 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



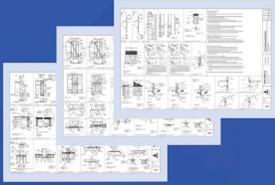
FLAT TRUSS



SELF DRILLING "SD" POINT SELF TAPPING

## ADDITIONAL PUBLICATIONS FROM MiTek®

MiTek® Builder Products is a division of MiTek® USA, Inc. MiTek product lines include the Hardy Frame® Shear Wall system, USP® Structural Connectors and Z4 Tie-Down System..



### Typical Installation Detail Pages

MiTek® provides the Hardy Frame Typical Installation Details in plan format. These pages are available in ACAD or pdf; organized by anchorage, typical first floor installations and those on floor systems. Any or all of these pages may be attached to your plans as supplemental sheets or you can copy selected details as needed.



### PRODUCT CATALOG

The MiTek® Hardy Frame® Product Catalog provides complete information for Engineers, Architects and Designers to specify our shear wall system. There is a complete listing of all Panels, Brace Frames and Accessories, allowable shear loads, corresponding uplift and drift, pre-engineered anchorage information, specification tips, photos and Typical Installation Details. The Installation Details in the Product Catalog conveniently match our ACad version that can be included as supplemental sheets to plan submittals.



### Retrofit Guide

Provides Building Owners with an introduction to construction techniques and MiTek® product lines available to strengthen soft-story buildings in retrofit applications. The MiTek® Hardy Frame® Shear Wall System combined with USP® Structural Connectors provides soft story solutions. This guide can be used by the Design Professional to illustrate retrofit concepts to their clients.



### MiTek® Z4 Product Catalog

The MiTek® Z4 product line includes the Cinch Nut, Continuity Tie (CT) and Tension Tie (T2). 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, along with the CT and T2, offer more design options than any other hold down system and are rated for tension capacities that range from 5,000 to over 82,000 lbs. In addition to continuous rod applications, the T2 can be used as a hold down in conventionally framed shear walls.



### MiTek® USP® Structural Connectors Product Catalog

Introducing the 2017 online catalog featuring new structural connector products and updated technical information. Our digital version will be updated often to ensure content is always current. This catalog is a comprehensive guide to our extensive product line featuring over 250 detailed application illustrations and detailed installation instructions, fastening schedules and load ratings. EWP and Plated Truss connectors are included. [www.mitek-us.com/resources/Product-Catalog/](http://www.mitek-us.com/resources/Product-Catalog/)

**MiTek®**  
**HARDY FRAME™**  
Shear Wall Systems

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[www.hardyframe.com](http://www.hardyframe.com)