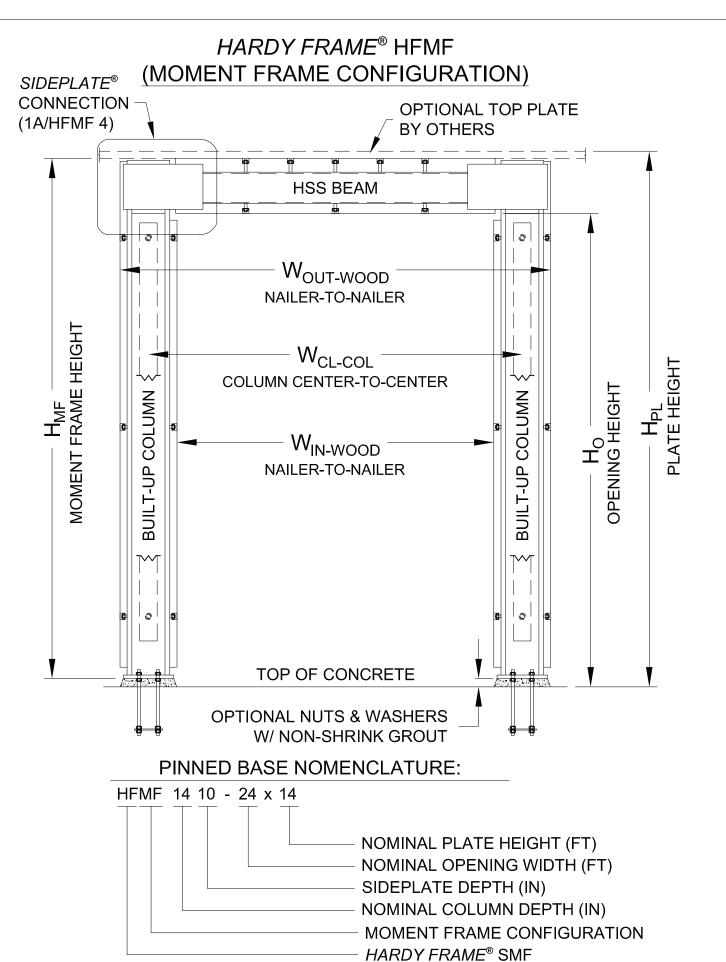
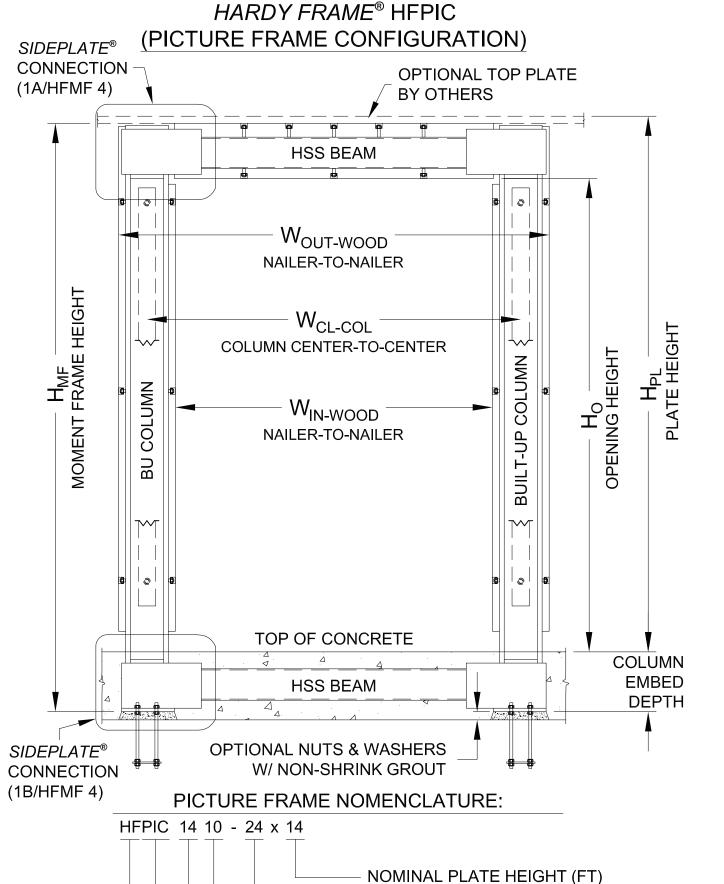


- 1. FINAL FRAME DIMENSIONS MAY BE ADJUSTED TO FIELD-SPECIFIC CONDITIONS. ANY CHANGE EXCEEDING THE NOMINAL HEIGHT OR SPAN FOR THE MODEL NUMBER SPECIFIED REQUIRES REVIEW AND APPROVAL BY THE ENGINEER OF RECORD PRIOR TO FRAME
- 2. CUSTOM DESIGNS AVAILABLE FOR FRAMES EXCEEDING THE OVERALL LIMITATIONS OF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





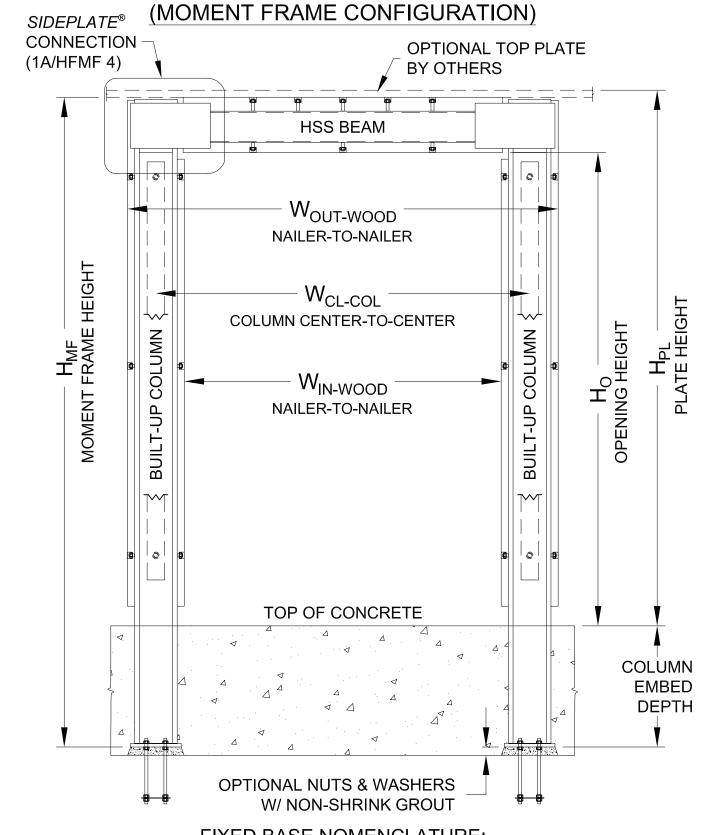
NOMINAL OPENING WIDTH (FT)

NOMINAL COLUMN DEPTH (IN)

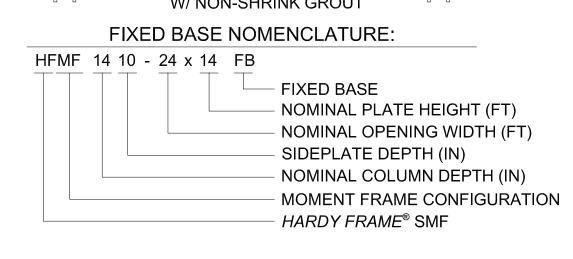
PICTURE FRAME CONFIGURATION

SIDEPLATE DEPTH (IN)

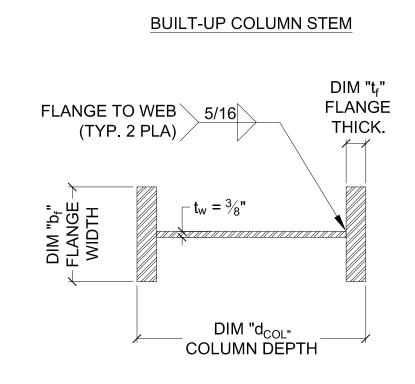
HARDY FRAME® SMF



HARDY FRAME® HFMF

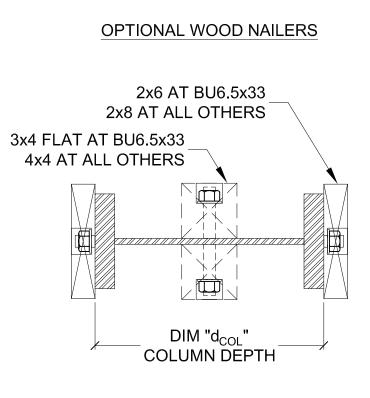


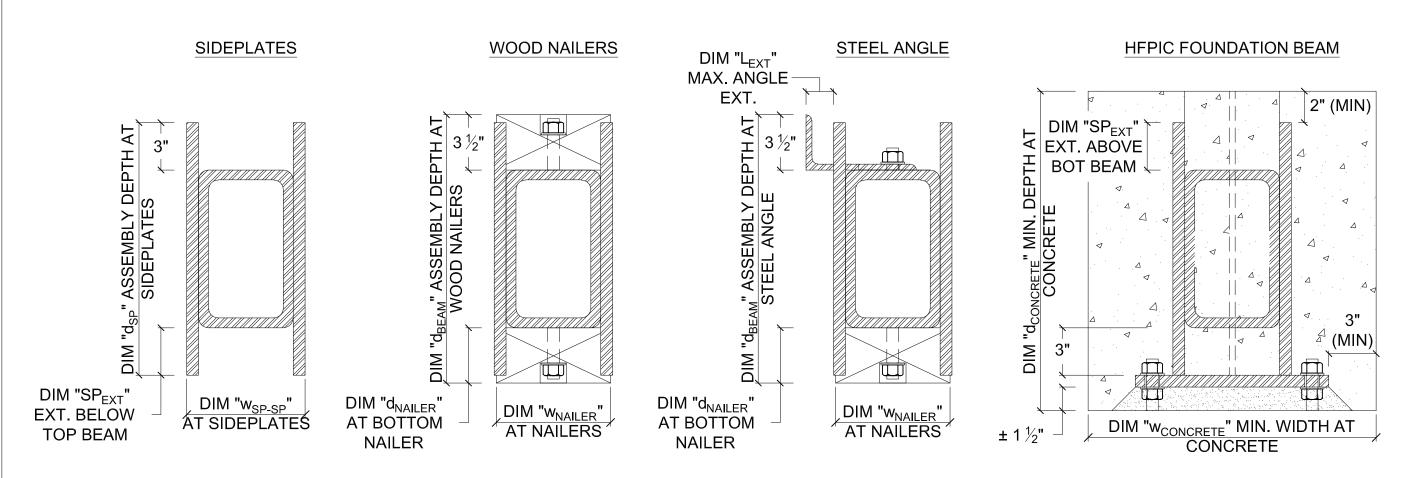
# FRAME CONFIGURATIONS AND GEOMETRY



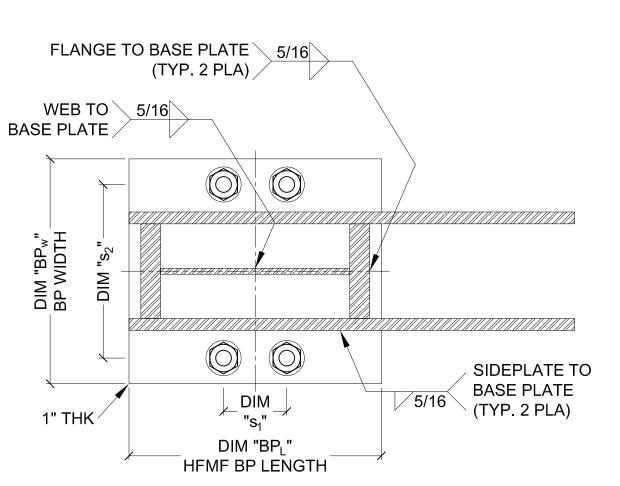
	COLUMN & BASE PLATE SECTION PROPERTIES										
COLUMN SECTION	FRAME TYPE	d <sub>COL</sub>	b <sub>f</sub>	t <sub>f</sub>	BPL	BP <sub>W</sub>	S <sub>1</sub>	s <sub>2</sub>			
BU6.5x33	HFMF	6 ½"	4"	1"	7 ½"	5 1/4"	2"	3"			
600.5833	HFPIC	0 /2			8"	11 <sup>3</sup> / <sub>4</sub> "	3"	8 ½"			
BU8.5x59	HFMF	8 ½"	6"	1 1/4"	9 ½"	7 ½"	3"	3"			
	HFPIC	0 /2			10"	14 1/4"		11"			
BU10.5x61	HFMF	10 ½"	6"	1 1/4"	11 ½"	7 ½"	4"	3"			
BO 10.5X01	HFPIC	10 /2			12"	14 1/4"	4	11"			
BU12.5x64	HFMF	12 ½"	6"	1 1/4"	13 ½"	7 ½"	4"	3"			
BU12.5X04	HFPIC	12/2			14"	14 1/4"	4	11"			
B1114 5v66	HFMF	14 ½"	6"	1 1/4"	15 ½"	7 ½"	<b>/</b> "	3"			
BU14.5x66	HFPIC	14/2			16"	14 1/4"	4"	11"			

HFPIC BASE PLATE





		HFMF BASE PL	<u>ATE</u>
	FLANG	GE TO BASE PLATE (TYP. 2 PLA)	5/16
BAS	WEB TO SE PLATE		
DIM "BP <sub>w</sub> " BP WIDTH	DIM "s2"		
DIM .			
1"	THK	_ DIM _  "s <sub>1</sub> "	
	ļ	DIM "BP <sub>L</sub> "  HFMF BP LENG	STH



HFMF BASE PLATE (BU6.5x33 ONLY)
FLANGE TO BASE PLATE 5/16 (TYP. 2 PLA)
WEB TO 5/16 BASE PLATE
DIM "BP <sub>w</sub> " BP WIDTH DIM "s <sub>2</sub> "
1" THK DIM "s <sub>1</sub> "  DIM "BP <sub>L</sub> "  HFMF BP LENGTH

		HEA	ADER BEAN	1 & FOUN	DATION BE	AM SECTI	ON PROP	ERTIES								
BEAM SECTION	FRAME TYPE	$d_SP$	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>CONCRETE</sub>	W <sub>CONCRETE</sub>					
HCC6v4v2/0	HFMF	11"	5"	2"	12"	5 ½"	2 ½"	12"	1 1/4"	N/A	N/A					
HSS6x4x3/8	HFPIC	11	5"	2"	12"					15 ½"	17 <sup>3</sup> ⁄ <sub>4</sub> "					
LICCOVEYE IO	HFMF	44"	7 1/ "	0"	12"	7 1/4"	2 ½"	12"	1 3/4"	N/A	N/A					
HSS6x6x5/8	HFPIC	11"	7 ½"	2"	12	1 /4	<b>2</b> /2	12		15 ½"	20 1/4"					
11000 0 1/0	HFMF	13"	40"	7 ½"	0"	14"	7 1/4"	2 ½"	14"	1 <sup>3</sup> ⁄ <sub>4</sub> "	N/A	N/A				
HSS8x6x1/2	HFPIC		/ /2	2"	14	1 /4	<b>Z</b> /2	14	1 74	17 ½"	20 1/4"					
11000 0 510	HFMF	14"	14"	14"	14"	14"	14"	7 1/ 11	3"	15"	<b>7</b> 1/ II	3 ½"	15"	1 3/4"	N/A	N/A
HSS8x6x5/8	HFPIC							14	14"	14"	14"	14"	7 ½"	3	15	7 1/4"
HSS10x6x1/2	HFMF	16"	7 1/ 11	0"	47"	<b>7</b> 1/ II	2 1/ "	17"	1 3/4"	N/A	N/A					
	HFPIC		7 ½"	3"	17"	7 1/4"	3 ½"	17	<b>1</b> 74	20 ½"	20 1/4"					
LICC10v6vE/0	HFMF	16"	7 1/"	3"	17"	<b>7</b> 1/ u	2 1/ "	17"	4 3/11	N/A	N/A					
HSS10x6x5/8	HFPIC		7 ½"	S	17	7 1/4"	3 ½"	17	1 3/4"	20 ½"	20 1/4"					

**COLUMN & BASE PLATE SECTIONS** 

USA,

MiTek

**NT FRAME** 

<sup>®</sup>SPECIAL MOME

HARDY FRAME

TYPICAL INSTALLATION DE FRAME GEOMETRY & CONFIGU

REVISIONS DATE

DATE:

05-23-19

MiTek

Inc

USA,

REVISIONS DATE

DATE: 05-23-19

HFMF

			AN	NCHORAG	E & TEMPI	_ATE KITS	1,2,3,8,9					
COLUMN		ANCHO	DRAGE	TOP OF CONCRETE			CONCRETE FOOTING					
SECTION FRAME TYPE	FRAME TYPE	QTY-DIA <sup>4</sup>	PLATE WASHER	MIN END DIST	MIN EDGE DIST	SHEAR TIES <sup>5</sup>	EMBED DEPTH, l <sub>e</sub>	END DIST, C <sub>a1</sub>	EDGE DIST, C <sub>a2</sub>	CLOSED STIRRUPS <sup>6</sup>	HOOKEI BARS <sup>7</sup>	
BU6.5x33	HFMF	2 - 3/4"	N/A	2 3/4"	2 1/4"	#3 @ 3" o.c.			21"	N/A	N/A	
606.5833	HFPIC	4 - 1 1/8"	N/A	N/A	N/A	N/A		27"		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	
600.5859	HFPIC	4 - 1 1/8"	½"x3"x3"	N/A	N/A	N/A				8-#5	6-#6	
BU10.5x61	HFMF	4 - 3/4"	½"x3"x3"	3 3/4"	2 1/4"	#3 @ 3" o.c.				4-#5	6-#5	
BU10.5X01	HFPIC	4 - 1 1/8"	½"x3"x3"	N/A	N/A	N/A				8-#5	8-#6	
DU12 5v64	HFMF	4 - 3/4"	½"x3"x3"	4 3/4"	2 1/4"	#3 @ 3" o.c.				5-#5	6-#5	
BU12.5x64	HFPIC	4 - 1 1/8"	½"x3"x3"	N/A	N/A	N/A				8-#5	8-#6	
BU14.5x66	HFMF	4 - 3/4"	½"x3"x3"	5 3/4"	2 1/4"	#3 @ 3" o.c.	• •			4-#5	8-#5	
	HFPIC	4 - 1 1/8"	½"x3"x3"	N/A	N/A	N/A				8-#5	10-#6	

DIM

"SH<sub>W</sub>"

"CS<sub>w</sub>"

HFMF6 SHEAR TIES

(BU6.5x33 ONLY)

BEND.

RADIUS [

**CLOSED STIRRUPS** 

"SH<sub>w</sub>"

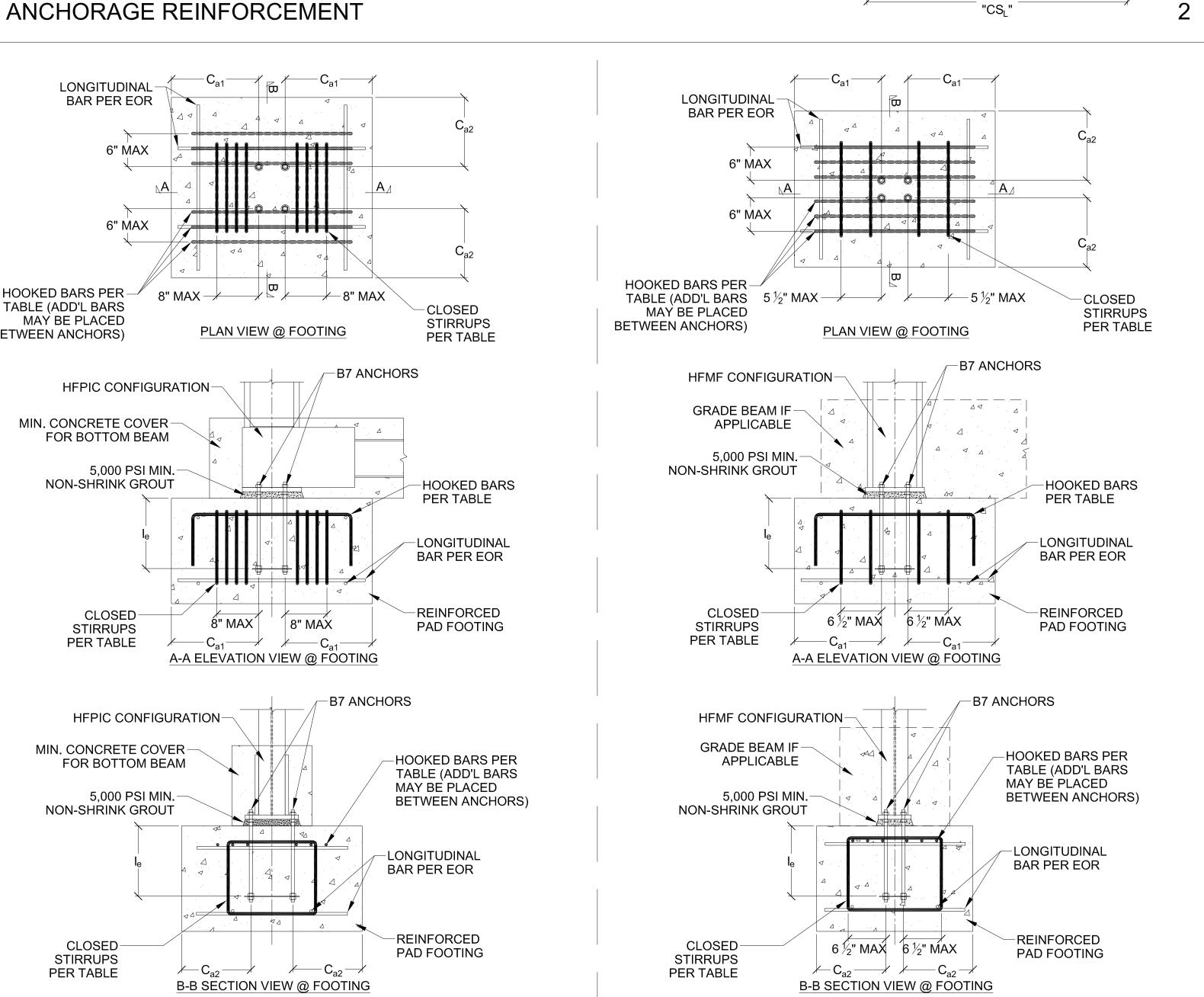
DIM

"SH<sub>I</sub>"

HFMF SHEAR TIES

- 1) Dimensions provided are the minimum requirement to satisfy pullout and shear transfer. Foundation, stem wall, and grade beam design by the engineer of record.
- 2) Anchorage is designed per AISC 341-10 and ACI 318-14 Chapter 17 assuming f'c = 2,500 psi. min.
- 3) Anchorage to shallow podium slabs or to existing concrete shall be designed by the engineer of record.
- 4) Anchor rods provided by *MiTek*®-*Hardy Frame*® comply with ASTM A193 Gr. B7 (or equal) and are stamped on both ends. (HF)
- 5) Unless the Moment Frame is installed directly on top of the 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 tabulated spacing with
- a minimum of 1 shear tie in the footing.
- 6) Closed stirrups are for transferring tension from anchorage to the concrete. See table for size and number per column. 7) Hooked bars are for transferring shear from anchorage to the concrete. See table for size and number per column.
- 8) Anchorage is designed assuming using *Hardy Frame*® Template Kits. For alternate anchorage designs, calculations shall be supplied by the engineer of record.
- 9) Moment Frame Template Kits Include the following accessories (see illustration for complete assembly):
- 2-Templates (HFMF-T)
- 2-Bolt Braces (HFMF-BB)
- 10-#3 Grade 60 Shear Ties (Not provided for HFPIC Picture Frames)
- 8-Anchor rods (4 for HFMF6) w/ 2 ea. Hardened Washers, 4 ea. Heavy Hex Nuts, & 1 ea. 3"x3"x½" plate washer per rod.

# ANCHORAGE REQUIREMENTS



HFMF ANCHORAGE AT FOOTING

REINFORCEMENT PARAMETERS

2 1/4"

N/A

5 1/4"

N/A

5 ½"

N/A

5 1/4"

N/A

5 1/4"

N/A

CS<sub>I</sub>

N/A

17"

19"

17"

19"

19"

19"

**HOOKED BARS** 

CLOSED STIRRUPS HOOKED BARS

N/A

29 3/4"

29 3/4"

34"

30 ¾"

35"

30 3/4"

35"

30 <sup>3</sup>/<sub>4</sub>"

35"

N/A

10 ½"

10 ½"

12 ½"

10 ½"

12 ½"

10 ½"

12 ½"

10 ½"

12 ½"

 $CS_W$ 

N/A

BEND\_

RADIUS

BEND-

"HB<sub>D</sub>"

RADIUS

SHEAR TIES

 $SH_L$ 

5 <sup>7</sup>/<sub>8</sub>"

N/A

5 1/4"

N/A

6 ½"

N/A

6 1/4"

N/A

6 1/4"

N/A

COLUMN

**SECTION** 

BU6.5x33

BU8.5x59

BU10.5x61

BU12.5x64

BU14.5x66

RADIUS:

≟#5 = 1 <sup>7</sup>⁄<sub>8</sub>"

 $#6 = 2\frac{1}{4}$ "

LONGITUDINAL

HOOKED BARS PER

TABLE (ADD'L BARS

**BETWEEN ANCHORS)** 

MAY BE PLACED

MIN. CONCRETE COVER

FOR BOTTOM BEAM

NON-SHRINK GROUT

CLOSED-

MIN. CONCRETE COVER

NON-SHRINK GROUT

CLOSED

**STIRRUPS** 

PER TABLE

FOR BOTTOM BEAM

5,000 PSI MIN.

HFPIC ANCHORAGE AT FOOTING

HFPIC CONFIGURATION

STIRRUPS

PER TABLE

**BAR PER EOR** 

8" MAX —

8" MAX 1

HFPIC CONFIGURATION

5,000 PSI MIN.

BEND

FRAME TYPE

HFMF

**HFPIC** 

**HFMF** 

**HFPIC** 

**HFMF** 

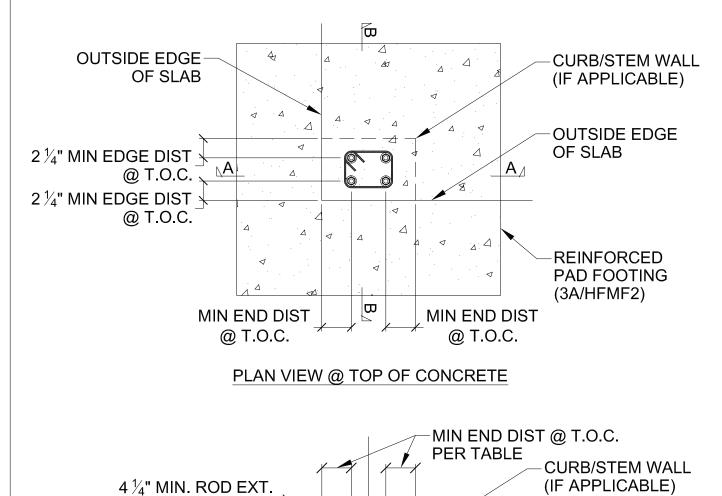
**HFPIC** 

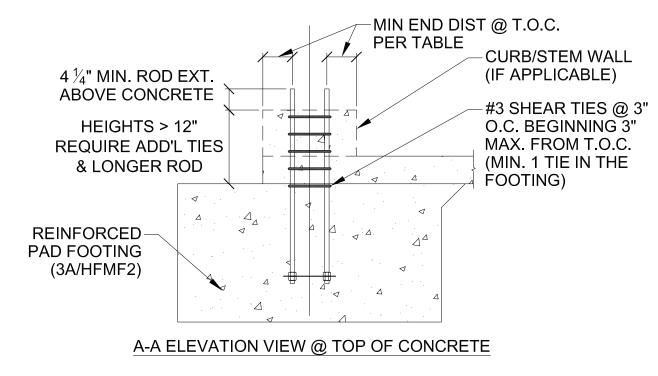
**HFMF** 

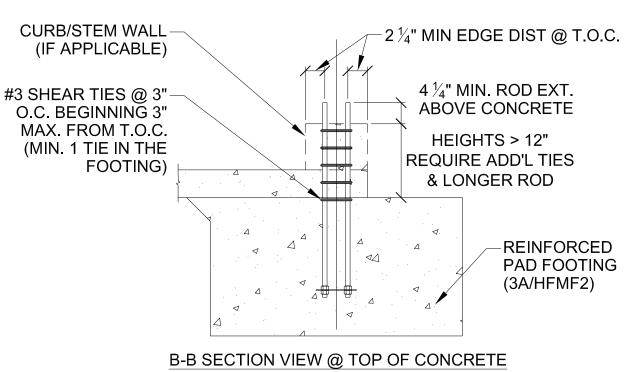
**HFPIC** 

**HFMF** 

**HFPIC** 







HFMF AT TOP OF CONCRETE

ORDERING AND INSTALLATION INSTRUCTIONS

APPLY TO NON-STANDARD MOMENT FRAMES ONLY)

1. CALL MiTek-USA, Inc. (800) 754-3030 FOR ORDERING INFORMATION.

MODEL NUMBER AND TRACKING NUMBER (TRACKING NUMBERS)

A. PROVIDE THE FOLLOWING INFORMATION FOR PRICING AND ORDERING:

JOB NAME, DELIVERY ADDRESS AND REQUESTED DELIVERY DATE

**DOUBLE NUT** 

AT TEMPLATE

MEASURED DISTANCE FROM NOTCH TO NOTCH

IS COLUMN CENTERLINE

**DOUBLE NUT** 

AT BOLT BRACE

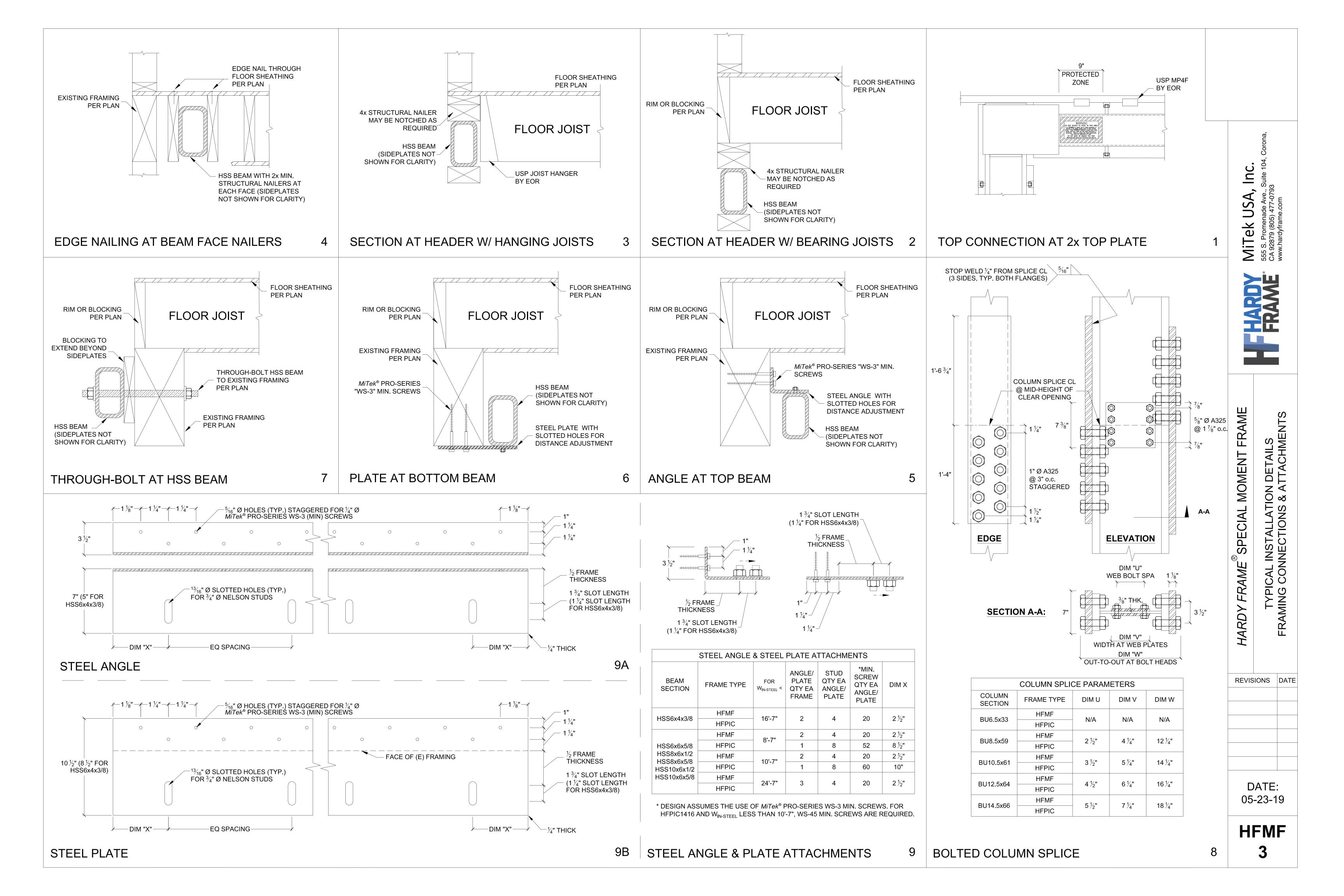
& PLATE WASHER

- ORDER QUANTITY FOR EACH MODEL NUMBER
- 2. JOBSITE CONDITIONS
  - A. CONSIDER JOBSITE ACCESS FOR UNLOADING, LOCATING AND
- INSTALLING PRE-ASSEMBLED MOMENT FRAMES B. 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)
- 4. CONCRETE PREPARATION
  - A. DETERMINE LOCATION AND LAYOUT OF TEMPLATES AND MOMENT FRAMES PER PLANS
  - B. 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.
  - C. SLOTTED HOLES ARE PROVIDED IN TEMPLATES FOR PULLING THE COLUMN CENTERLINE WIDTH (W<sub>CI-COI</sub>). PRIOR TO POURING CONCRETE CONFIRM THE SLOT TO SLOT DIMENSION CORRESPONDS TO THE CORRECT  $W_{\text{CL-COL}}$  DIMENSION FOR THE MOMENT FRAME MODEL
- NUMBER BEING INSTALLED. MOMENT FRAME INSTALLATION
- A. INSTALL BOTTOM (LEVELING) NUT AND WASHER ON ALL ANCHORS.
- B. 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. C. 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.
- D. INSTALL WASHERS AND NUTS ABOVE THE BASE PLATES AND FINGER
- E. 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
- F. WHEN FIT AND ALIGNMENT MEET FRAMERS APPROVAL TIGHTEN ALL NUTS UNTIL "SNUG TIGHT".
- G. BRACE THE INSTALLED MOMENT FRAME IN THE OUT OF PLANE DIRECTION AND RE-CHECK FOR PLUMB.
- H. MAKE TOP CONNECTIONS PER PLANS AND SPECIFICATIONS.
- I. 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** 



# HARDY FRAME® 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:
- A. INTERNATIONAL BUILDING CODE (IBC) 2012 & 2015
- B. PREQUALIFIED CONNECTIONS FOR SPECIAL MOMENT FRAMES FOR SEISMIC APPLICATIONS (AISC 358s2-14 & AISC 358-16, CH. 11)
- C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (AISC 360-10 & AISC 360-16)
- D. AMERICAN INSTITUTE OF STEEL CONSTRUCTION SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS (AISC 341-10 & AISC 341-16)
- E. AMERICAN WELDING SOCIETY D1.1 2015 STRUCTURAL WELDING CODE-STEEL (AWS D1.1 & D1.8)
- 2. 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
    - [D] HORIZONTAL SHEAR PLATE
    - {6} FILLET WELD CONNECTING SIDE WALL OF HSS BEAM TO SIDE PLATE
    - {7} HORIZONTAL FLARE-BEVEL WELD CONNECTING HSS BEAM RADIUS TO SIDE PLATE [A]

### 1. MATERIAL

- A. MOMENT CONNECTION PLATE AND BUILT-UP COLUMN PLATE MATERIAL MEETS THE REQUIREMENTS OF ASTM A572, GRADE 50
- B. BASE PLATE MATERIAL MEETS THE REQUIREMENTS OF ASTM A572
- C. ALL OTHER FASTENERS AND COMPONENTS INCLUDING ANGLE AND PLATE
- SHEAR TRANSFER CONNECTIONS MEET THE REQUIREMENTS OF ASTM A36 D. ANCHOR BOLTS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A307
- (AS REQUIRED BY LOCAL JURISDICTIONS)
- E. NELSON STUDS (F<sub>v</sub>=70ksi)
- F. COLUMN & BEAM WOOD NAILERS MEET THE REQUIREMENTS OF NO. 2 DOUGLAS FIR LARCH OR BETTER

## ROLLED SHAPES:

- A. ROLLED W-SHAPES USED FOR COLUMNS OR BEAMS MEET THE REQUIREMENTS OF ASTM A992
- B. HSS SECTIONS USED FOR COLUMNS OR BEAMS MEET THE REQUIREMENTS OF ASTM A500 GRADE B

# 3. WELD FILLER METAL

- A. 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-8 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.
- B. 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

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

# **PREPARATION**

- 1. THE FABRICATOR EMPLOYS A DISTORTION CONTROL PROGRAM TO ADDRESS CONTROL OF DISTORTION AND WELD SHRINKAGE. INCLUDING MAINTENANCE OF DIMENSIONAL ACCURACY.
- 2. 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.

# 3. THERMAL CUTTING:

- A. 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.
- B. 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.
- C. THERMAL CUTTING PROCESSES ARE LIMITED TO PLASMA ARC-CUTTING OR OXYFUEL GAS PROCESSES.

# QUALITY CONTROL

1. 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

1. 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):
  - A. 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 MANUFACTURE'S RECOMMENDATIONS.
  - B. EACH WPS PREPARED IS BASED ON AND REFERENCED TO A DOCUMENTED AND APPROVED PROCEDURE QUALIFICATION RECORD (PQR).
  - C. THE APPROVED WPS FOR EACH APPLICABLE PRODUCTION WELD IS CLEARLY DISPLAYED TO PROVIDE READY ACCESS BY THE ASSIGNED WELDERS, WELDING SUPERVISORS AND INSPECTORS.
  - D. ALL WPSs ARE PREPARED BY QUALIFIED INDIVIDUALS. WPSs ARE PREPARED BY THE SAME INDIVIDUAL RESPONSIBLE FOR THE SUITABILITY OF THE WPS.

#### 3. WELDING PROCEDURE QUALIFICATION (PQR):

- A. DOCUMENTED PROCEDURE QUALIFICATION RECORDS ARE MAINTAINED BY MITek®-HARDY FRAME®. 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).
  - CHARPY 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.
- B. ALL PROCEDURE QUALIFICATION TESTING IS PERFORMED BY AN INDEPENDENT CERTIFIED AND APPROVED TESTING LABORATORY
- C. 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 AWSD1.1.

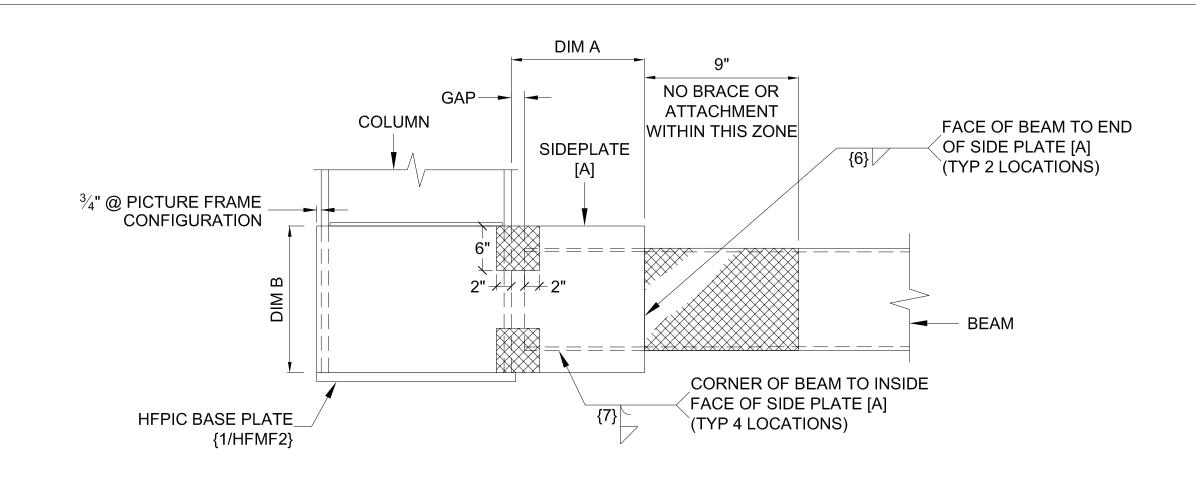
# 4. TACK WELDS:

- A. 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
- B. VERTICAL TACK WELDS BETWEEN SIDE PLATE [A] AND FLANGE EDGES OF COLUMN ARE NOT PLACED WITHIN 2 INCHES OF EACH END OF WELD {2}. C. TACK WELDS BETWEEN SIDE PLATES [A] AND HSS BEAM ARE NOT PLACED
- WITHIN 2 INCHES OF EACH END OF WELD {7} D. 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. 5. WELD RUN-OFF TABS ARE NOT USED FOR FILLET WELDS.
- 6. PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS:
  - A. 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.
  - B. 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.
  - C. 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.
- 7. 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.
- 8. ARC STRIKES ON CONNECTION PLATES, BEAMS AND COLUMNS ARE TO BE AVOIDED.
- 9. WELD TIE-INS ARE NOT PERMITTED
- 10. PEENING IS NOT ALLOWED.

# NO BRACE OR **ATTACHMENT** FACE OF BEAM TO END WITHIN THIS ZONE OF SIDE PLATE [A] **SIDEPLATE** (TYP 2 LOCATIONS) $\frac{3}{4}$ " WELDED STUDS TO BEAM, TYP. **QUANTITY PER TABLE** BEAM ½" @ MOMENT FRAME CONFIGURATION **CORNER OF BEAM TO INSIDE** 3/4" @ PICTURE FRAME CONFIGURATION FACE OF SIDE PLATE [A] (TYP 4 LOCATIONS) COLUMN HEADER BEAM CONNECTION

# 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.



# FOUNDATION BEAM CONNECTION (HFPIC CONFIGURATION ONLY)

		SI	DEPLATE®	CONNECTION I	DESIGN PA	ARAMETE	RS			
MODEL NUMBER	COLUMN	PLATE THICKNESS		BEAM	GAP	DIMEN	ISIONS	WELD	<sup>3</sup> / <sub>4</sub> " STUDS**	
		[A]	[D]			Α	В	{6}	{7}*	QTY.
HFMF611	BU6,5x33	1/2"	3/8"	HSS6x4x3/8	1"	8"	11"	1/4"	1/4"	6
HFPIC611	DU0.5X33	/2	78	HSS0X4X3/6	<b>I</b>	0	11	/4	/4	0
HFMF811	BU8.5x59	3/4"	3/8"	LICCGYGYE/9	<b>1</b> 1/"	8"	11"	1/4"	1/4"	8
HFPIC811	BU6.5X59	74	78	HSS6x6x5/8	1 ½"					8
HFMF813	DI 10 5-50	3/4"	3/"	LICC9y6y4/2	4 1/"	10"	13"	1/4"	1/4"	8
HFPIC813	BU8.5x59	74	3/8"	HSS8x6x1/2	1 ½"	10	13	/4	/4	0
HFMF1013	BU10.5x61	3/4"	3/8"	HSS8x6x1/2	1 ½"	10"	13"	1/4"	1/4"	10
HFPIC1013	DU 10.5x61	74	78					/4		15
HFMF1014	BU10.5x61	3/4"	3/8"	HSS8x6x5/8	1 ½"	10"	14"	1/4"	1/4"	10
HFPIC1014	BU10.5x01	74	78	H220X0X3/0	1 /2	10	14			10
HFMF1214	BU12.5x64	3/4"	3/8"	HSS8x6x5/8	<b>4</b> 1/"	10"	14"	1/4"	1/4"	12
HFPIC1214	BU12.5X04	74	78	H330X0X3/0	1 ½"					18
HFMF1216	BU12.5x64	3/4"	3/8"	HSS10x6x1/2	4 1/"	13"	16"	1/4"	1/4"	40
HFPIC1216	DU 12.5X04	74	78	HSS 10x0x 1/2	1 ½"	13"	10			12
HFMF1416	D1114 Ev66	3/4"	3/8"	USS10v6v1/2	1 ½"	10"	13" 16"	1/4"	1/ "	14
HFPIC1416	BU14.5x66	74	78	HSS10x6x1/2		13"			1/4"	22
HFMF1416	D1114 Ev66	3/4"	3/"	110040 0 5/2	4 1/"	13"	16"	1/4"	1/4"	1.1
HFPIC1416	BU14.5x66	74	3/8"	HSS10x6x5/8	1 ½"					14

WELD {7} IS A FLAIR-BEVEL 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

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REVISIONS DATE

DATE: 05-23-19

**HFMF** 

