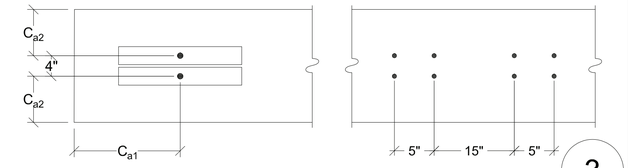
BACK-TO-BACK REINFORCED ANCHORAGE (BB-RA)

MODEL NUMBER	COLUMN WIDTH	ANCHOR DIA & GRADE [1,2]	EMBED DEPTH, l_e [3]	MIN END DIST, C_{a1} [4]	MIN EDGE DIST, C_{a2} [5]	STIRRUPS [8]	SHEAR TIES [6,7]
HFXPIC12	12"	1-1/8" HS @ Columns & 5/8" HS @ Mid Beam	23"	22 3/4"	13"	8 - #4	#3 (MIN) @ 3" O.C.
HFXPIC15	15"					10 - #4	
HFXPIC18	18"					10 - #4	
HFXPIC21	21"					12 - #4	



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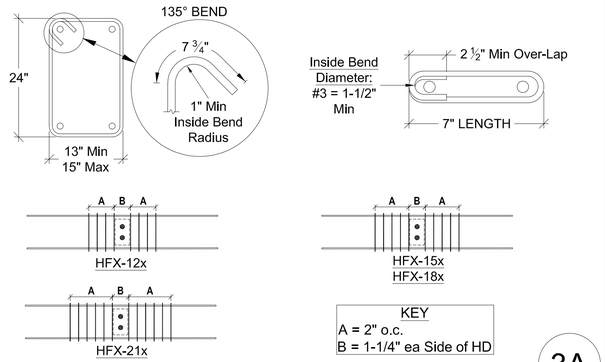
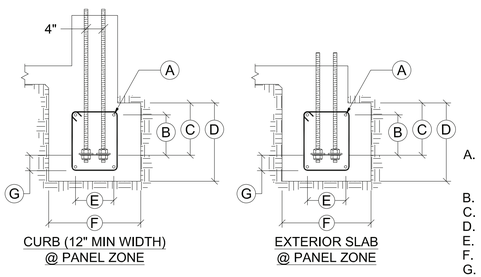


3A

BB-RA SHEAR TIES & STIRRUPS



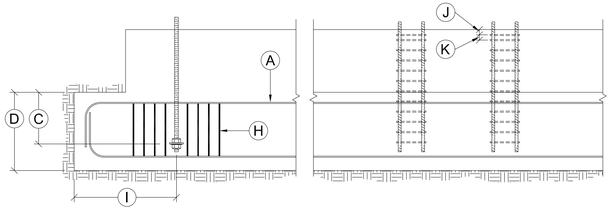
CURB (12" MIN WIDTH) @ PANEL ZONE

EXTERIOR SLAB @ PANEL ZONE

CURB (12" MIN WIDTH) @ SILL BEAM

EXTERIOR SLAB @ SILL BEAM

A. #4 (Min) Longitudinal Rebar Top and Bottom by EOR
B. 20" Max
C. 23" Min
D. 30" Min
E. CL = 11" Min, 13" Max
F. 2'-6" (Min)
G. 4" Min
H. Shear Ties per Table
I. C_{a1} per Table
J. 1-1/4" clear spacing from top of concrete at first shear tie
K. 1" c.c. Max



ANCHORAGE @ FOOTING / GRADE BEAM BELOW PANEL ZONE

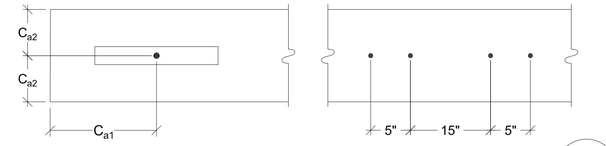
ANCHORAGE @ FOOTING / GRADE BEAM BELOW SILL BEAM

3B

BB-RA SECTIONS & ELEVATIONS

SINGLE REINFORCED ANCHORAGE (RA)

MODEL NUMBER	COLUMN WIDTH	ANCHOR DIA & GRADE [1,2]	EMBED DEPTH, l_e [3]	MIN END DIST, C_{a1} [4]	MIN EDGE DIST, C_{a2} [5]	STIRRUPS [8]	SHEAR TIES [6,7]
HFXPIC12	12"	1-1/8" HS @ Columns & 5/8" HS @ Mid Beam	16"	16 3/4"	12"	4 - #4	#3 (MIN) @ 3" O.C.
HFXPIC15	15"					6 - #4	
HFXPIC18	18"					6 - #4	
HFXPIC21	21"					6 - #4	



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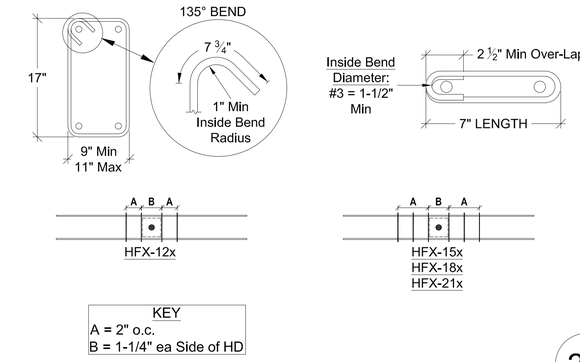
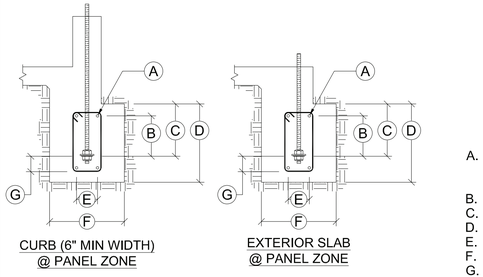


2A

RA SHEAR TIES & STIRRUPS



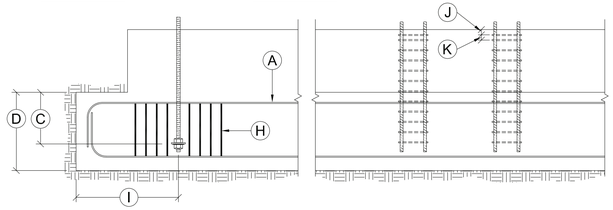
CURB (6" MIN WIDTH) @ PANEL ZONE

EXTERIOR SLAB @ PANEL ZONE

CURB (6" MIN WIDTH) @ SILL BEAM

EXTERIOR SLAB @ SILL BEAM

A. #4 (Min) Longitudinal Rebar Top and Bottom by EOR
B. 13" Max
C. 16" Min
D. 23" Min
E. CL = 7" Min, 8" Max
F. 2'-0" (Min)
G. 4" (Min)
H. Shear Ties per Table
I. C_{a1} per Table
J. 1-1/4" clear spacing from top of concrete at first shear tie
K. 1" c.c. Max



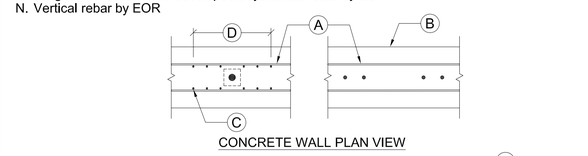
ANCHORAGE @ FOOTING / GRADE BEAM BELOW PANEL ZONE

ANCHORAGE @ FOOTING / GRADE BEAM BELOW SILL BEAM

2B

RA SECTIONS & ELEVATIONS

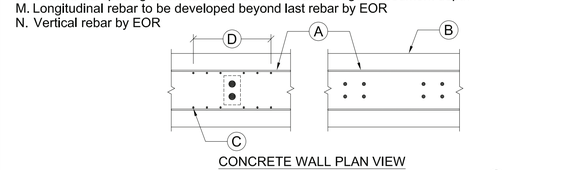
A. 3 ea. #5 min. longitudinal rebar @ both faces of the wall (6 total) by EOR
B. Face of concrete
C. #4 straight rebar
D. Quantity & spacing per Detail 2A
E. 28" Min.
F. l_e = 29-1/2" Min.
G. Rebar to extend 24" min. below end of the anchorage & lap w/ continuous wall reinforcement specified by EOR
H. CL = 0.6 x wall width Max.
I. Wall width by EOR to provide min. concrete coverage per ACI requirements
J. 1-1/2" clear spacing from top of concrete at first longitudinal rebar
K. 2" CL spacing between top 3 longitudinal rebar
L. 6" max. CL spacing for horizontal rebar within anchorage embedment depth
M. Longitudinal rebar to be developed beyond last rebar by EOR
N. Vertical rebar by EOR



1A

RA TERMINATION WITHIN CONCRETE WALL

A. 5 ea. #5 min. longitudinal rebar @ both faces of the wall (10 total) by EOR
B. Face of concrete
C. #4 straight rebar
D. Quantity & spacing per Detail 3A
E. 32" Min.
F. l_e = 33-1/2" Min.
G. Rebar to extend 24" min. below end of the anchorage & lap w/ continuous wall reinforcement specified by EOR
H. CL = 0.6 x wall width Max.
I. Wall width by EOR to provide min. concrete coverage per ACI requirements
J. 1-1/2" clear spacing from top of concrete at first longitudinal rebar
K. 2" CL spacing between top 5 longitudinal rebar
L. 6" max. CL spacing for horizontal rebar within anchorage embedment depth
M. Longitudinal rebar to be developed beyond last rebar by EOR
N. Vertical rebar by EOR



1B

BB-RA TERMINATION WITHIN CONCRETE WALL

TABLE NOTES

1. DESIGNS ARE TO RESIST LOADING PER ACI 318-14, SECTION 17.2.3.4.3.
2. HS INDICATES ANCHORS COMPLYING WITH ASTM A193 GRADE B7 WITH A 1/2" X 3" X 3"(MIN) HFPW PLATE WASHER INSTALLED WITH DOUBLE NUTS ON THE EMBED END (HFXBB NOT REQUIRED).
3. l_e = LENGTH OF EMBEDMENT FROM THE TOP OF FOOTING OR GRADE BEAM TO THE TOP OF THE HFXBB BOLT BRACE (TOP OF THE EMBEDDED HFPW PLATE WASHER @ HS ANCHORS)
4. C_{a1} = DISTANCE FROM HD CENTERLINE TO THE END OF THE FOOTING OR GRADE BEAM.
5. C_{a2} = DISTANCE FROM HD CENTERLINE TO BOTH THE FRONT AND THE BACK FACE OF THE FOOTING OR GRADE BEAM.
6. SHEAR TIES ARE GRADE 60 (MIN) REBAR AND REQUIRED PER ACI-318-14, F'C = 2,500 PSI. CURBS AND STEM WALLS MUST BE 6 INCH (MIN) WIDTH FOR RA, 12 INCH (MIN) WIDTH FOR BB-RA. IN ANY CASE, THE MINIMUM CONCRETE COVERAGE SHOULD BE PROVIDED PER ACI 318-14.
7. SHEAR TIES ARE NOT REQUIRED FOR INSTALLATION ON WOOD FRAMING, OR FOR IRC BRACED WALL PANEL APPLICATIONS.
8. STIRRUPS ARE GRADE 60 (MIN) REBAR. SEE TABLE FOR SIZE AND SPACING. SEE "STIRRUP LAYOUT" DIAGRAMS AND "KEY" FOR LAYOUT PATTERNS.
9. CONCRETE EDGE DISTANCES MUST COMPLY WITH ACI 318-14, SECTION 17.7.1

A

1. DETERMINE LOCATION AND LAYOUT OF THE MOMENT FRAME TEMPLATES PER PLANS.
2. INSTALL TEMPLATES AND ANCHORS PER PLAN DETAILS. REFER TO INSTALLATION INSTRUCTIONS AND PRODUCT LABELING FOR CORRECT TEMPLATE ORIENTATION, ANCHOR ASSEMBLIES, ANCHOR HEIGHT ABOVE CONCRETE AND SPACING BETWEEN TEMPLATES FOR FINISH FRAME WIDTH.
3. SLOTTED HOLES ARE PROVIDED IN TEMPLATES FOR PULLING THE COLUMN CENTERLINE DIMENSIONS. PRIOR TO POURING CONCRETE, CONFIRM THE SLOT TO SLOT DIMENSION ACCURATELY CORRESPONDS TO THE COLUMN CENTERLINE DIMENSION FOR THE MOMENT FRAME MODEL NUMBER BEING INSTALLED OR PER PLAN CALLOUTS BY THE DESIGN PROFESSIONAL.

CONCRETE PREPARATION INSTRUCTIONS

B

IMPORTANT!

1. ANCHORAGE IS DESIGNED FOR SINGLE STORY APPLICATIONS ONLY.
2. ANCHORAGE IS DESIGNED FOR TENSION AND SHEAR TRANSFER ONLY, FOUNDATION DESIGN PER EOR.
3. REINFORCEMENT SHOWN IS THE MINIMUM REQUIREMENT AND IS NOT INTENDED TO REPLACE REINFORCEMENT DESIGNED BY THE EOR.
4. 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: ½" x 3" x 3" MIN. HFPW PLATE WASHERS ARE REQUIRED TO BE DOUBLE-NUTTED AT EMBED END OF HIGH STRENGTH ANCHOR RODS.)
5. HIGH STRENGTH ALL-THREAD RODS PROVIDED BY MITEK ARE STAMPED ON BOTH ENDS.

HF B7

IMPORTANT NOTES

C

REVISIONS	DATE

HARDY FRAME HFX PICTURE FRAME
PICTURE CONFIGURATION INSTALLATION DETAILS

ENGINEER OF RECORD IS RESPONSIBLE FOR DESIGN TO ACCOMODATE ACTUAL PROJECT CONDITIONS

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

HARDY FRAME

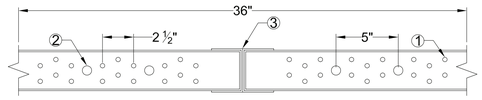
DATE: 08-01-2019

HFXPIC 1B

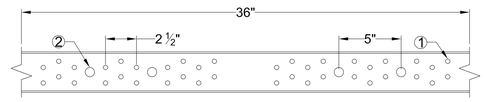
1. AT LOCATIONS OF PICTURE FRAME INSTALLATIONS FRAME WITH A 4x (MINIMUM) RIM, 4x BLOCKING AT CANTILEVER CONDITIONS. SHEET THE FLOOR THEN LAYOUT THE 2x SILL PLATE FOR WALL FRAMING.
2. DETERMING THE LOCATION OF PICTURE FRAME AND USE TEMPLATES BY MANUFACTURER TO PULL COLUMN CENTERLINE DIMENSIONS WHILE CHECKING FOR END AND EDGE DISTANCES. SLOTTED HOLES ARE PROVIDED IN TEMPLATES FOR PULLING THE COLUMN CENTERLINE DIMENSION. MARK FOR DRILLING THE CONTINUOUS TIE-DOWN SYSTEM ROD.
3. PRIOR TO DRILLING CONFIRM THAT THE SLOT TO SLOT DIMENSION ACCURATELY CORRESPONDS TO THE COLUMN CENTERLINE DIMENSION FOR THE PICTURE FRAME MODEL NUMBER BEING INSTALLED OR PER PLAN CALLOUTS BY THE DESIGN PROFESSIONAL.
4. DRILL THROUGH THE SILL PLATE, FLOOR SYSTEM AND TOP PLATES OF WALL BELOW. INSTALL THE CONTINUOUS ALL-THREAD ROD (PER PLANS) TO A COUPLER NUT IN WALL FRAMING BELOW. WITH TOP OF ROD EXTENDING 7-1/2 INCHES ABOVE TOP OF FLOOR SHEETING INSTALL THE 2x SILL PLATE.

FLOOR SYSTEM PREPARATION INSTRUCTIONS

3



W/ HEADER BEAM SPLICE



W/O HEADER BEAM SPLICE

1. 5/16" HOLES FOR WS SCREWS (QTY PER TABLE)
2. 3/4" HOLES FOR 5/8" HS CAST IN PLACE ANCHORS.
3. SPLICE AT MID-SPAN REQUIRED WHEN OUT-TO-OUT IS >13 FT.

SCREW HOLE PATTERN

2

TABLE 2: MEMBER DIMENSIONS, GEOMETRY & CONNECTORS												
MODEL NUMBER	MEMBER DIMENSIONS			FRAME GEOMETRY						CONNECTORS		
	COLUMN WIDTH, W_{COL}	BEAM DEPTH, D_{BEAM}	COLUMN DEPTH, D_{COL}	H_{MF} (max)	H_O (max)	W_{IN} (min)	W_{IN} (max)	W_{CL} (max)	W_{OUT} (max)	HOLD DOWN QTY, DIA, & GRADE[1]	SCREW QTY[2] (MIN)	SCREW QTY AVAILABLE AT EDGES[3] (MIN)	JOINT BOLT QTY, DIA, AND GRADE
HFXPIC1212	12"	12"	3 ½"	9'-8 ¼"	8'-9 ¾"	7'-0"	17'-0"	20'-0"	19'-0"	4 EA 1 ⅛" HS	20	4	4 EA 1 ⅛" HS
HFXPIC1512	15"				8'-9 ¾"	6'-9"	16'-9"		19'-3"		24		
HFXPIC1515	15"	15"			8'-6 ¾"	6'-9"	16'-9"		19'-3"		30		
HFXPIC1812	18"	12"			8'-9 ¾"	6'-6"	16'-6"		19'-6"		28		
HFXPIC1815	18"	15"			8'-6 ¾"	6'-6"	16'-6"		19'-6"		34		
HFXPIC2115	21"				8'-6 ¾"	6'-3"	16'-3"		19'-9"		36		

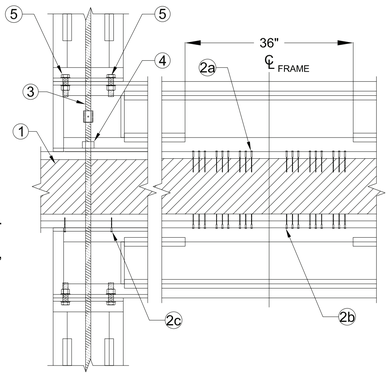
TABLE NOTES:
1. HOLD DOWN ANCHOR BOLTS CONNECT TO THE COLUMN BASE WITH HARDENED ROUND WASHERS BELOW GRADE 8 NUTS. ALTERNATE WASHERS ARE (2 EA) ROUND-FLAT OR (2 EA) SAE WASHERS ON EACH BOLT. ALTERNATE NUTS ARE 2H HEAVY HEX.
2. 1/4" DIAMETER MITEK PRO-SERIES SCREWS ARE 3" (MINIMUM) WHEN CONNECTING DIRECTLY TO THE COLLECTOR ABOVE.
3. ADJACENT FRAMING WITH 1/4" DIAMETER SCREWS IS REQUIRED AT THE COLUMN EDGES WHEN INSTALLING A FILLER ABOVE THE BEAM THAT IS GREATER THAN 1-1/2" OR WHEN SPECIFIED BY THE DESIGN PROFESSIONAL.

CFS PICTURE FRAME INSTALLATION INSTRUCTIONS
1. CONSIDER ACCESS TO MAKE SCREW CONNECTIONS INTO FRAMING MEMBERS ABOVE AND BELOW, THE NEED FOR ELECTRIC FIXTURES, WOOD BACKING OR BATT INSULATION THEN STAND THE ASSEMBLED FRAME WITH THE OPEN (CAVITY) FACE ORIENTED IN THE DIRECTION THAT ACCOMMODATES CONNECTIONS AND CONSIDERS THE OTHER TRADES.
2. LIFT AND INSTALL THE FRAME OVER CONTINUOUS TIE-DOWN RODS AND SET DIRECTLY ON 2x SILL PLATE.
3. INSTALL A Z4 CINCH NUT (CNX) PER PLANS PUSHING DOWN THE ROD UNTIL IT SEATS TO THE INSIDE FLANGE OF THE PANEL ZONE. INSTALL SCREWS THROUGH THE CNX FLANGES INTO THE HOLES PROVIDED IN THE PANEL ZONE FLANGE. INSTALL A COUPLER NUT THAT WILL RECEIVE THE TIE-DOWN ROD FROM ABOVE.
4. BRACE THE FRAME IN THE OUT OF PLANE DIRECTION AND CHECK FOR PLUMB.
5. MAKE TOP AND BOTTOM CONNECTIONS TO FRAMING MEMBERS ABOVE AND BELOW WITH MITEK PRO-SERIES SCREWS PER PLANS.

MEMBER DIMENSIONS, GEOMETRY & CONNECTORS

1

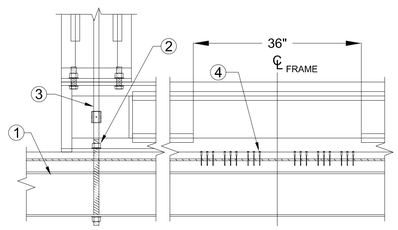
1. 4x RIM (MIN)
2. a) 1/4" x 4-1/2" (MIN) WS SCREWS (QTY PER TABLE 2)
   b) 1/4" x 3" (MIN) WS SCREWS (QTY PER TABLE 2)
   c) 1/4" x 3" (MIN) WS SCREWS FOR OUT-OF-PLANE BRACING
3. Z4 CONTINUOUS TIE DOWN SYSTEM.
4. CINCH NUT (CNX). LOCATED AT TOP PANEL ZONE WHEN PANEL RUN ENDS (AS OCCURS).
5. GRADE 8 MACHINE BOLT WITH HEAD AND HARDENED ROUND WASHER IN PANEL ZONE, DTI WASHER AND GRADE 8 NUT IN COLUMN. **IMPORTANT**: SILICONE POCKETS TO BE IN CONTACT WITH TOP OF COLUMN!



MULTISTORY INSTALLATION

4

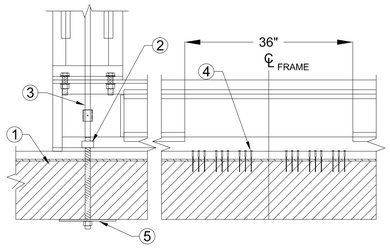
CFS HEADER BEAM TO COLUMNS ASSEMBLY INSTRUCTIONS
1. LAYOUT THE HEADER BEAM AND COLUMNS WITH OPEN (CAVITY) FACE UP.
2. CHECK THAT ACCESS AT MID-SPAN OF HEADER BEAM FOR SHEAR TRANSFER SCREWS TO WOOD FRAMING IS ORIENTED CORRECTLY.
3. ORIENT THE BOLTS THROUGH THE HEADER BEAM WITH THE HEAD AND DIRECT TENSION INDICATOR (DTI) WASHER IN THE COLUMN, HARDENED ROUND WASHER AND GRADE 8 NUT IN THE PANEL ZONE.
4. SNUG NUTS AT ALL BOLTS, THEN TIGHTEN UNTIL THE MAJORITY OF ORANGE SILICONE POCKETS BURST INDICATING REQUIRED TENSIONIS MET.
5. WHEN BOLT CONNECTIONS ARE NOTED SNUG-TIGHT, HARDENED ROUND WASHERS CAN SUBSTITUTE FOR DTI WASHERS.



1. STEEL BEAM WITH STRUCTURAL NAILER PER PLANS.
2. NUTS AND WASHERS PER TABLE 2 NOTE 1.
3. Z4 CONTINUOUS TIE DOWN SYSTEM WHEN OCCURS.
4. 1/4" x 4-1/2" (MIN) WS SCREWS (QTY PER TABLE 2)

STEEL BEAM THRU-BOLT

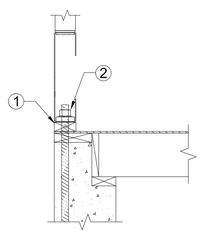
6



1. WOOD BEAM PER PLAN.
2. CINCH (NUT) CNX
3. Z4 CONTINUOUS TIE DOWN SYSTEM WHEN OCCURS.
4. 1/4" x 4-1/2" (MIN) WS SCREWS (QTY PER TABLE 2)
5. BEARING PLATE WASHER AT UNDERSIDE OF BEAM SIZED PER BUILDING DESIGN PROFESSIONAL TO LIMIT CRUSHING FROM ANCHOR TENSION.

WOOD BEAM THRU-BOLT

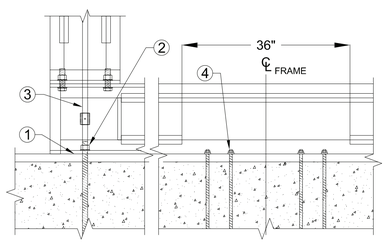
5



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

RAISED STEM WALL

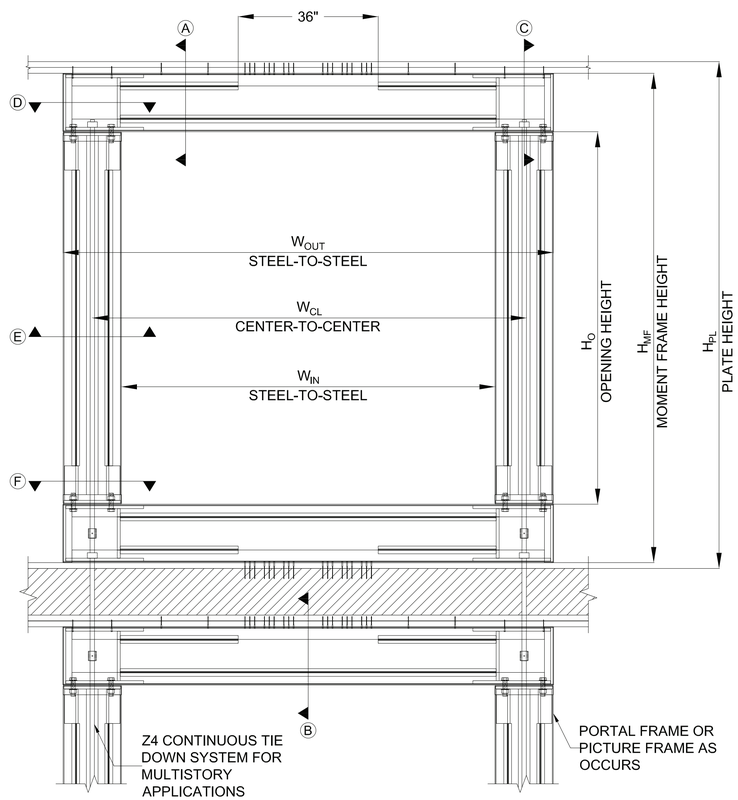
9

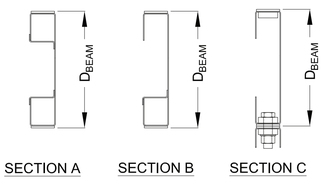


1. 15# FELT OR EQUIVALENT MOISTURE BARRIER RECOMMENDED BETWEEN FRAME AND TREATED PLATE.
2. NUTS AND WASHERS PER TABLE 2 NOTE 1.
3. Z4 CONTINUOUS TIE DOWN SYSTEM WHEN OCCURS.
4. CAST IN PLACE ANCHORS.

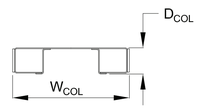
INSTALLATION ON 2x SILL PLATE

8

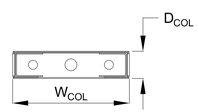




SECTION D



SECTION E



SECTION F

CFS PICTURE FRAME NOMENCLATURE

HFX	PIC	18	12	-	8	x	8	
								NOMINAL WALL HEIGHT (FT)
								NOMINAL CENTER TO CENTER SPAN (FT)
								BEAM DEPTH (IN)
								COLUMN WIDTH (IN)
								HARDY FRAME CFS PICTURE FRAME

NOMENCLATURE AND DIMENSIONING

7

REVISIONS	DATE

HARDY FRAME HFX PICTURE FRAME
PICTURE CONFIGURATION INSTALLATION DETAILS

ENGINEER OF RECORD IS RESPONSIBLE FOR DESIGN TO ACCOMODATE ACTUAL PROJECT CONDITIONS

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

HARDY FRAME

DATE: 08-01-2019

HFXPIC 2B