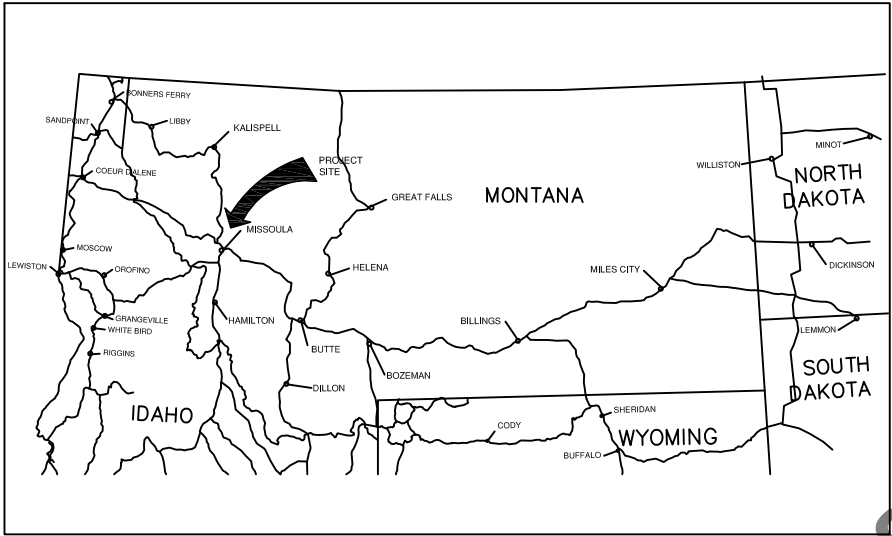
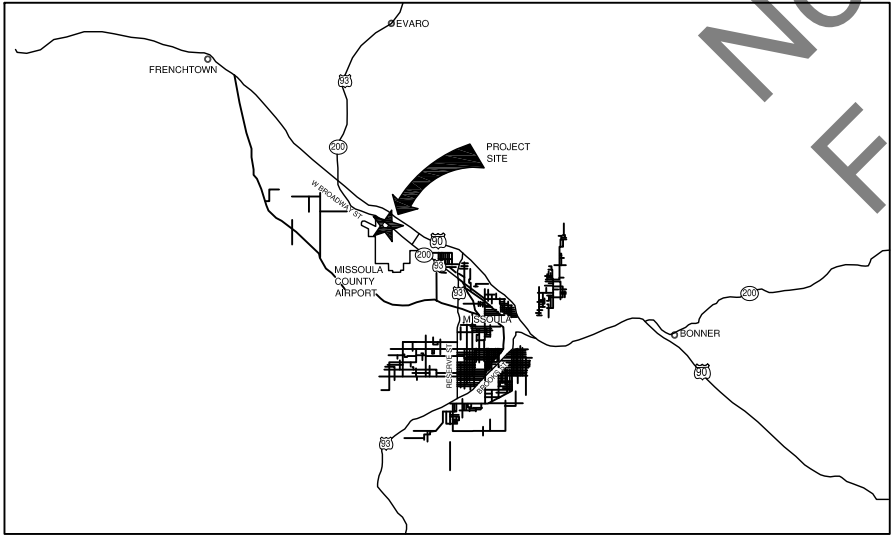


USDA FOREST SERVICE MISSOULA AERIAL FIRE DEPOT RAPPEL TOWER



VICINITY MAP

NOT TO SCALE



PROJECT LOCATION MAP

NOT TO SCALE

STRUCTURAL

AEGIS ENGINEERING, INC.
700 S.W. HIGGINS, SUITE 200
MISSOULA, MONTANA 59803

- S0.0 COVER SHEET
- S1.0 TOWER FOUNDATION PLAN & FIRST LEVEL FRAMING PLAN
- S1.1 TOWER SECOND & THIRD LEVEL FRAMING PLANS
- S1.2 FIRST, SECOND & THIRD LEVEL HANDRAIL PLANS
- S2.0 TOWER ELEVATIONS
- S2.1 TOWER ELEVATIONS
- S3.0 ABBREVIATIONS, GENERAL NOTES & SCHEDULES
- S4.0 FRAMING DETAILS
- S5.0 STAIR & HANDRAIL DETAILS
- S6.0 SIMULATOR PLANS & ELEVATIONS
- S7.0 SIMULATOR DETAILS
- S7.1 SIMULATOR ACCESSORY DETAILS

PROJECT APPROVALS & RECOMMENDATIONS		
APPROVED	R1 DIRECTOR OF ENGINEERING	DATE
APPROVED	R1 DIRECTOR OF FIRE & AVIATION	DATE
RECOMMENDED	R1 REGIONAL AVIATION OFFICER	DATE
RECOMMENDED	R1 REGIONAL HELICOPTER OPERATIONS SPECIALIST	DATE
RECOMMENDED	MTDC CENTER MANAGER	DATE

REVISION

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Suite 200

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U.S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

REGION ONE

FILE No.

USDA FOREST SERVICE

RAPPEL TOWER

AERIAL FIRE DEPOT

MISSOULA, MONTANA

DESIGNED BY

JDG

DRAWN BY

KAR

CHECKED BY

DEH

SHEET TITLE

COVER SHEET

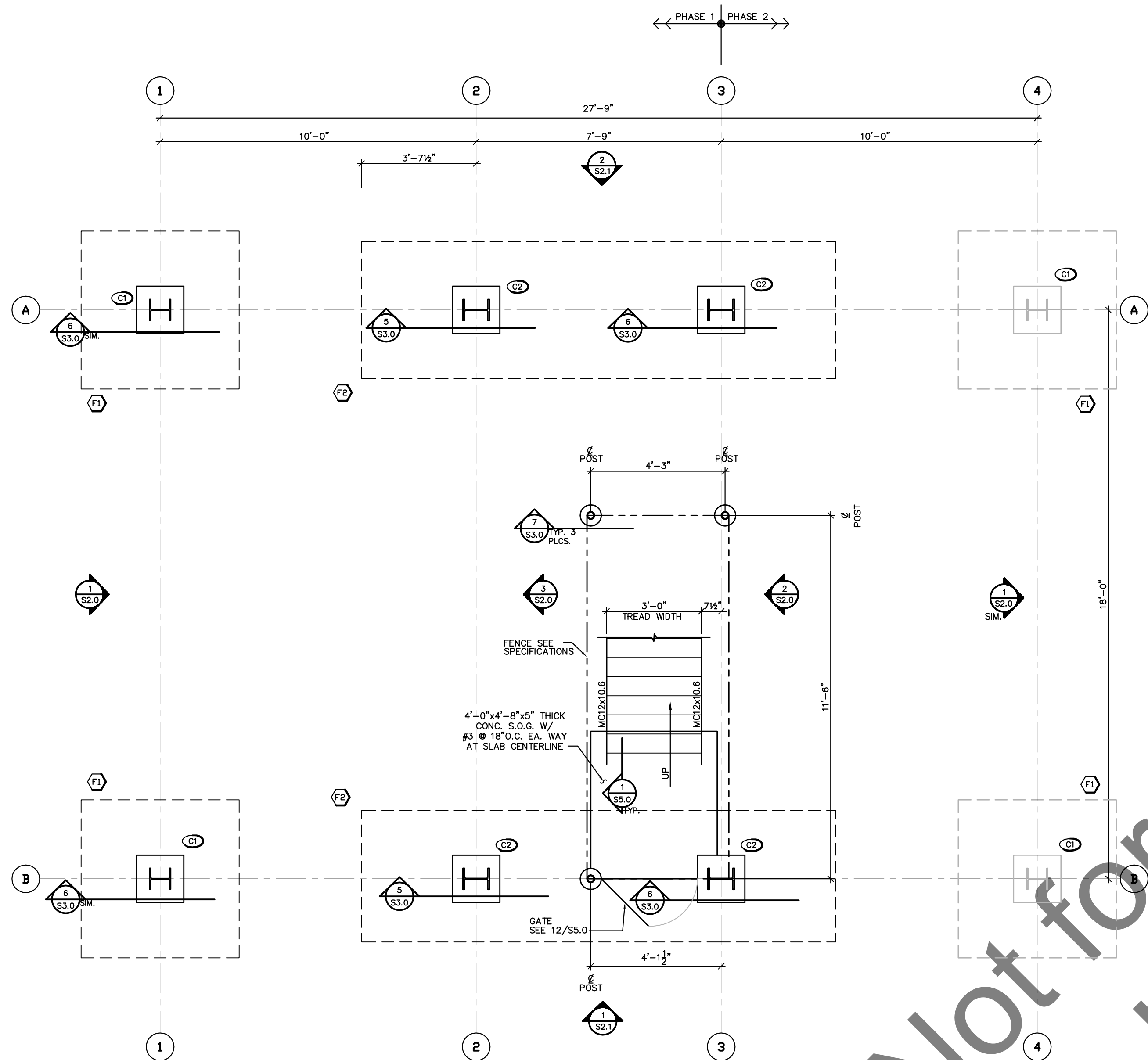
DATE

05/15/08

SHEET No.

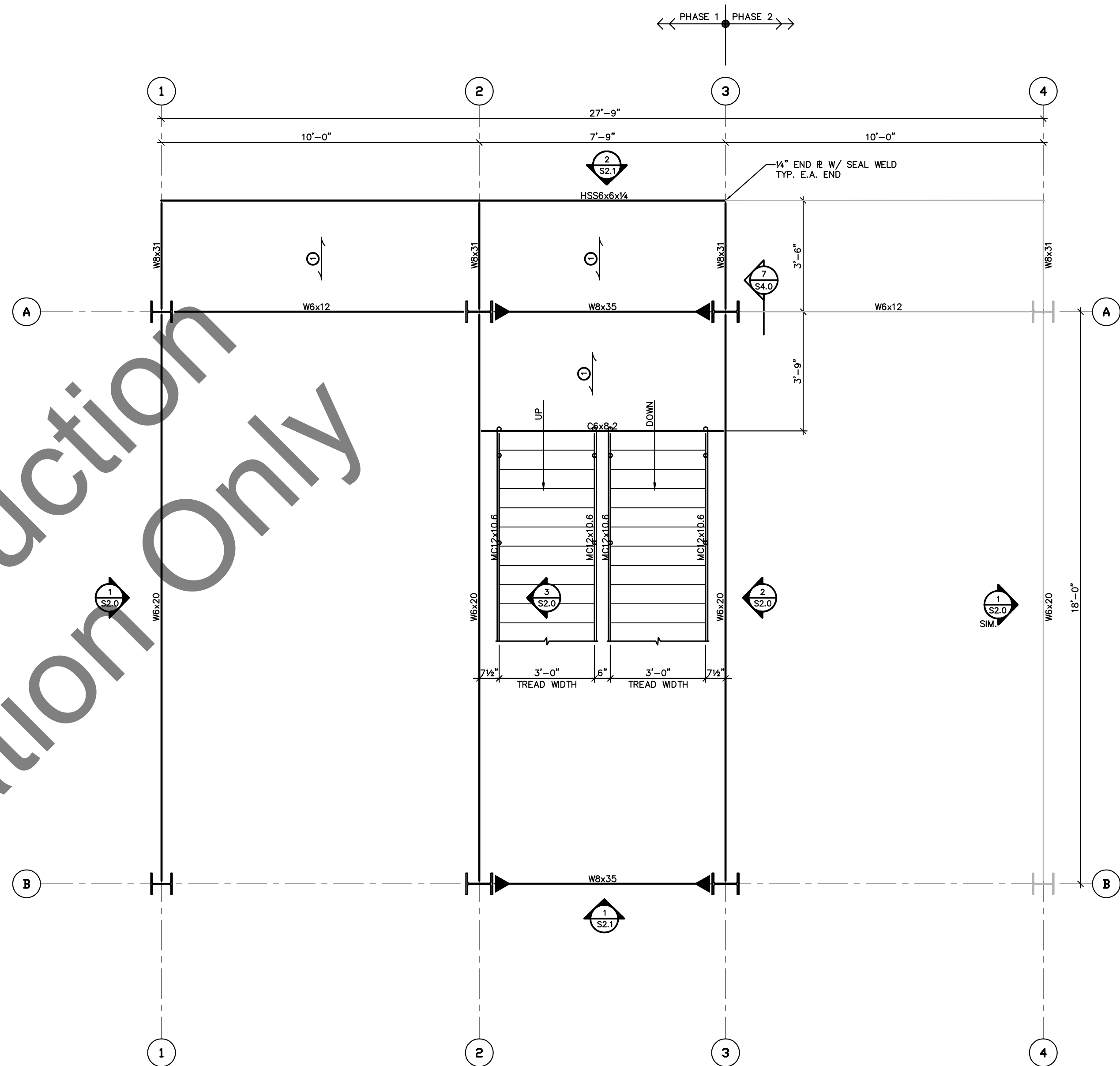
S0.0

1 OF 12



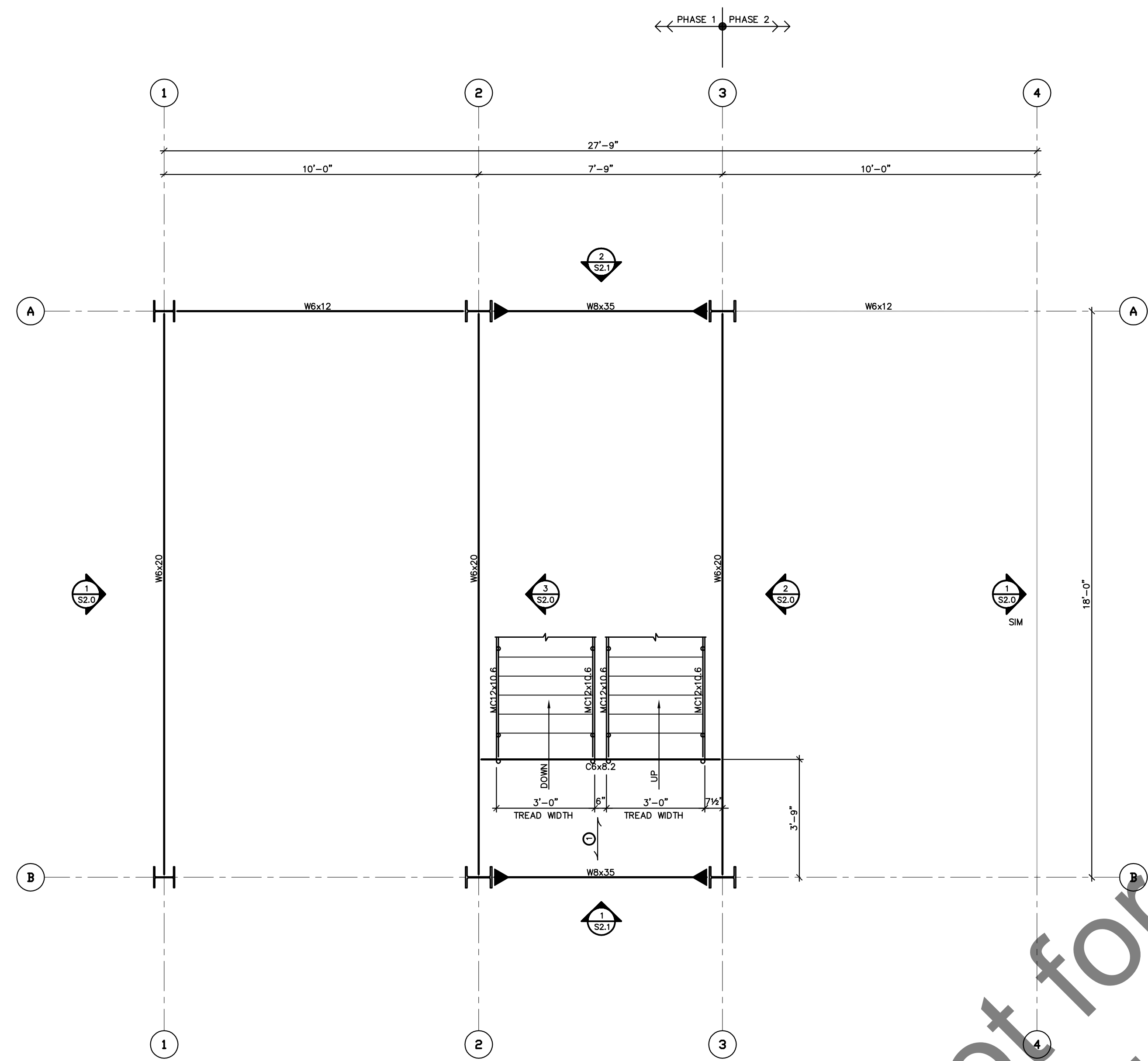
TOWER FOUNDATION PLAN
SCALE: 3/8" = 1'-0"

- FOUNDATION PLAN NOTES**
- INDICATES FOOTING MARK NO., SEE FOOTING SCHEDULE SHEET S3.0.
 - INDICATES COLUMN MARK NO., SEE COLUMN SCHEDULE SHEET S3.0.
 - STAIR TREADS SHALL BE SERRATED TYPE B STANDARD 1 1/4"x3/8" BEARING BARx9 3/4" GRATING TREADS AS MANUF. BY McNICHOLS CO. OR APPROVED EQUAL
 - CENTER COLUMNS AND PIERS ON FOOTING U.N.O.

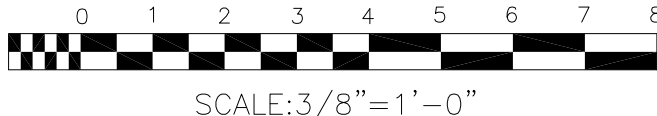


TOWER FIRST LEVEL FRAMING PLAN
SCALE: 3/8" = 1'-0"

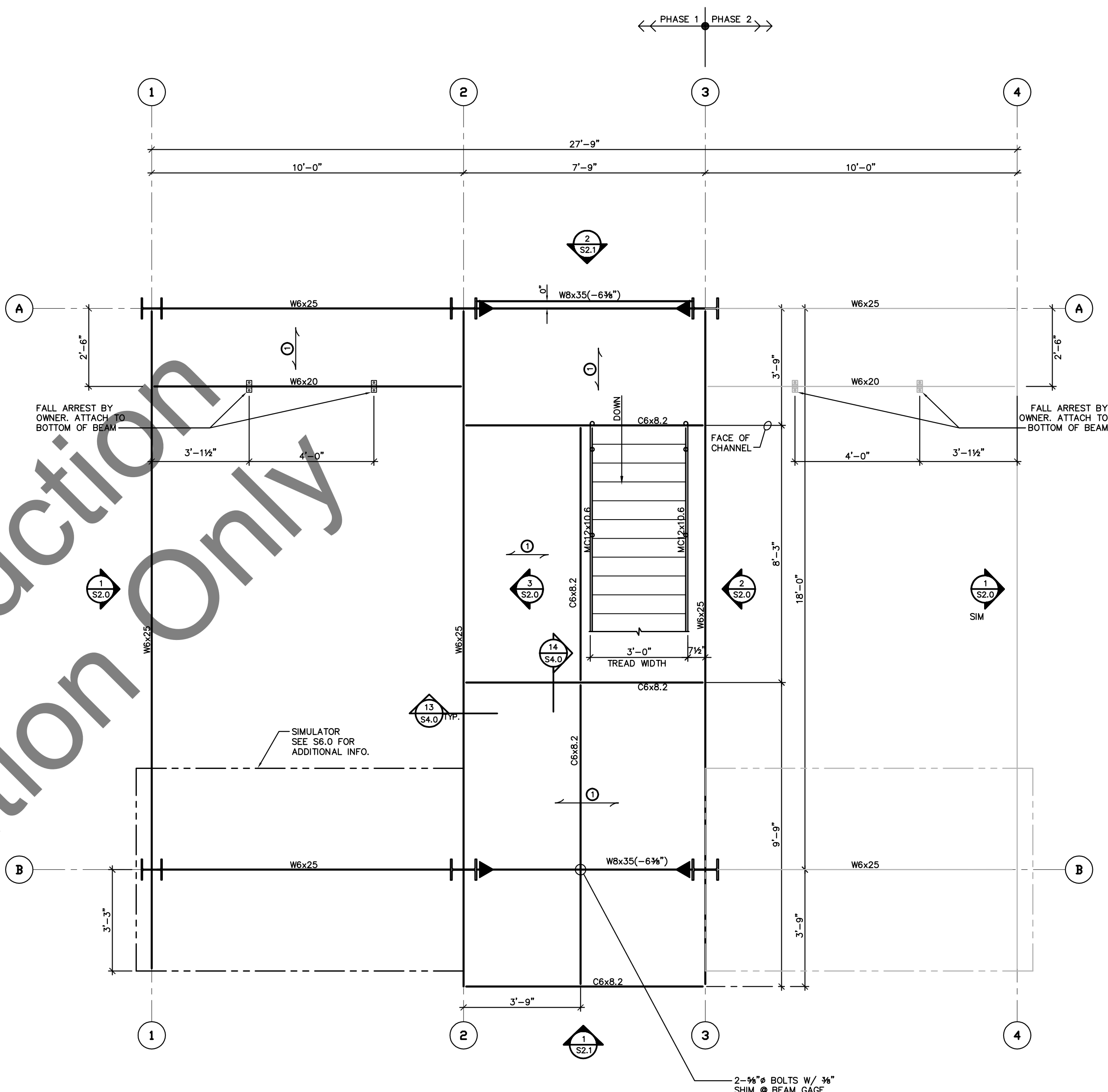
- FRAMING PLAN NOTES**
- INDICATES SPAN DIRECTION OF McNICHOLS CO. TYPE GW-100 SERRATED WELDED STEEL GRATING WITH 1"x1/4" BEARING BARS @ 1 1/4" O.C. OR APPROVED EQUAL.
 - INDICATES MOMENT CONNECTION
 - SEE FOUNDATION PLAN FOR COLUMN SIZES.
 - SEE S1.2 FOR HANDRAIL PLAN
 - STAIR TREADS SHALL BE SERRATED TYPE B STANDARD 1 1/4"x3/8" BEARING BARx9 3/4" GRATING TREADS AS MANUF. BY McNICHOLS CO. OR APPROVED EQUAL.



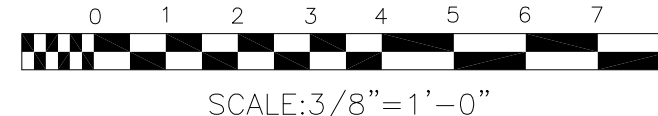
TOWER SECOND LEVEL FRAMING PLAN
SCALE: 1/2" = 1'-0"



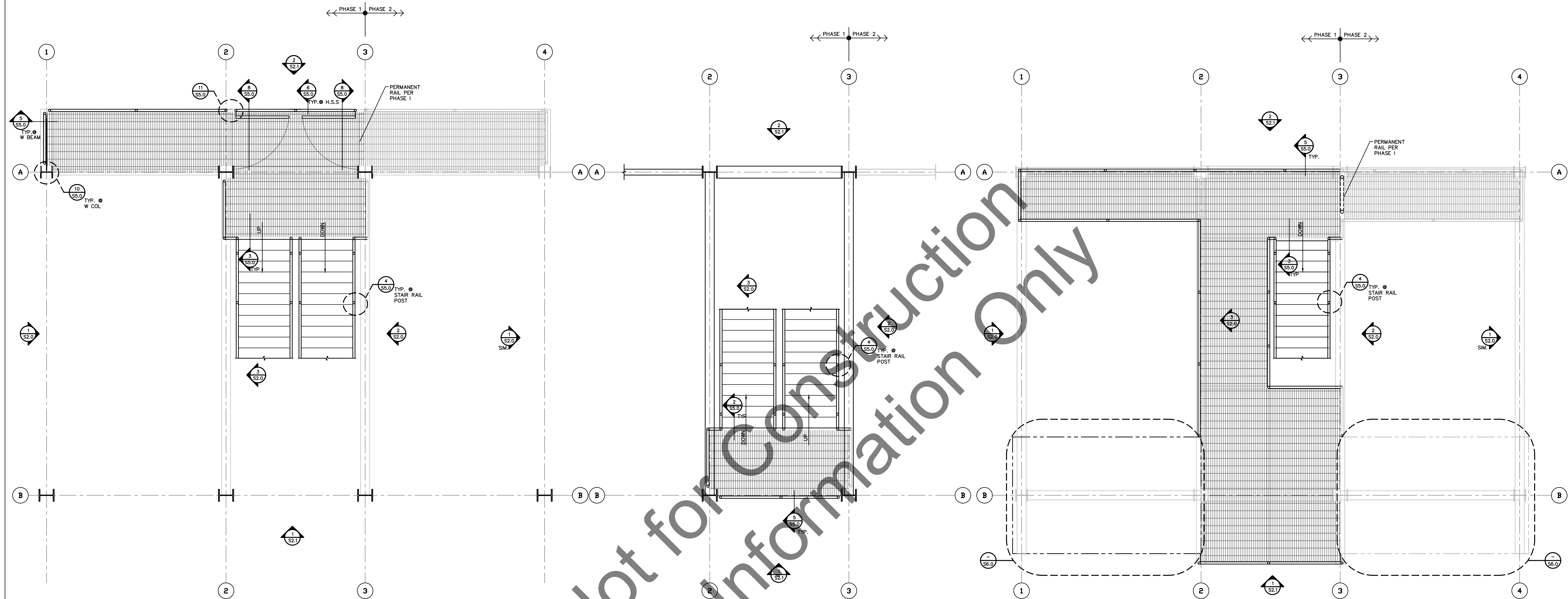
- FRAMING PLAN NOTES**
- INDICATES SPAN DIRECTION OF McNICHOLS CO. TYPE GW-100 SERRATED WELDED STEEL GRATING WITH 1"x3/4" BEARING BARS @ 1 1/4" O.C. OR APPROVED EQUAL.
 - INDICATES MOMENT CONNECTION
 - 1. SEE FOUNDATION PLAN FOR COLUMN SIZES.
 - 2. SEE S1.2 FOR HANDRAIL PLAN
 - 3. STAIR TREADS SHALL BE SERRATED TYPE B STANDARD 1 1/4"x3/4" BEARING BARx9 3/4" GRATING TREADS AS MANUF. BY McNICHOLS CO. OR APPROVED EQUAL.



TOWER THIRD LEVEL FRAMING PLAN
SCALE: 1/2" = 1'-0"



- FRAMING PLAN NOTES**
- INDICATES SPAN DIRECTION OF McNICHOLS CO. TYPE GW-100 SERRATED WELDED STEEL GRATING WITH 1"x3/4" BEARING BARS @ 1 1/4" O.C. OR APPROVED EQUAL.
 - INDICATES MOMENT CONNECTION
 - 1. SEE FOUNDATION PLAN FOR COLUMN SIZES.
 - 2. SEE S1.2 FOR HANDRAIL PLAN
 - 3. STAIR TREADS SHALL BE SERRATED TYPE B STANDARD 1 1/4"x3/4" BEARING BARx9 3/4" GRATING TREADS AS MANUF. BY McNICHOLS CO. OR APPROVED EQUAL.



1 1ST LEVEL HANDRAILS
SCALE: 3/8"=1'-0"

2 2ND LEVEL HANDRAILS
SCALE: 3/8"=1'-0"

3 3RD LEVEL HANDRAILS
SCALE: 3/8"=1'-0"

SHEET NOTES

1. HANDRAIL SHALL BE WEATHERING STEEL
2. SEE 9/S5.0 FOR TYP HANDRAIL ELEV.

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FOREST SERVICE
REGION ONE
FILE NO.

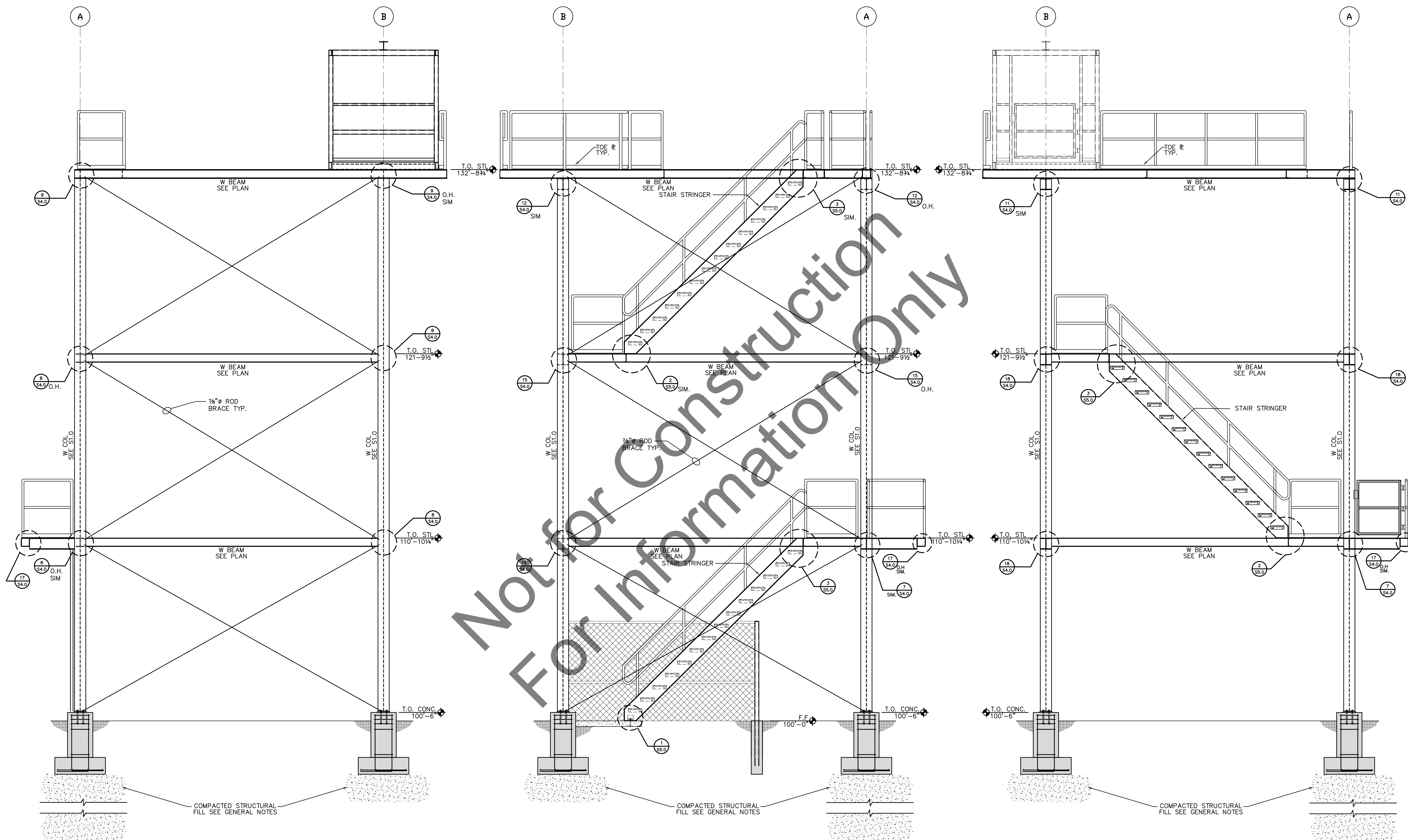
USDA FOREST SERVICE
RAPPEL TOWER
AERIAL FIRE DEPOT
MISSOULA, MONTANA

DESIGNED BY JDG	DRAWN BY KAR	CHECKED BY DEH
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SHEET TITLE
FIRST
SECOND &
THIRD LEVEL
HANDRAIL PLAN

DATE
05/15/08

SHEET No.
S1.2
4 OF 12



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FILE No. _____

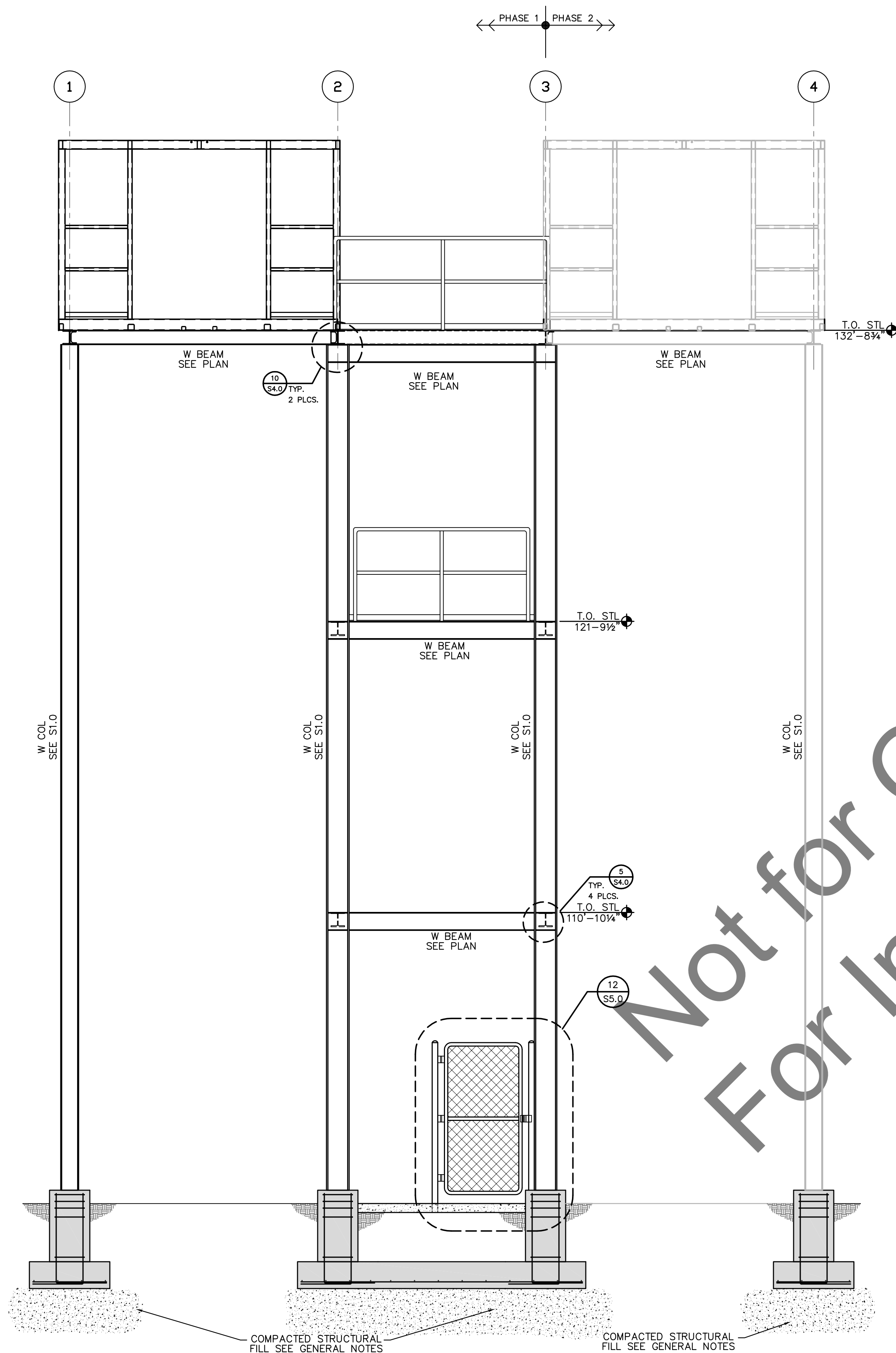
USDA FOREST SERVICE
RAPPEL TOWER
AERIAL FIRE DEPOT
MISSOULA, MONTANA

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JDG
DRAWN BY
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DEH

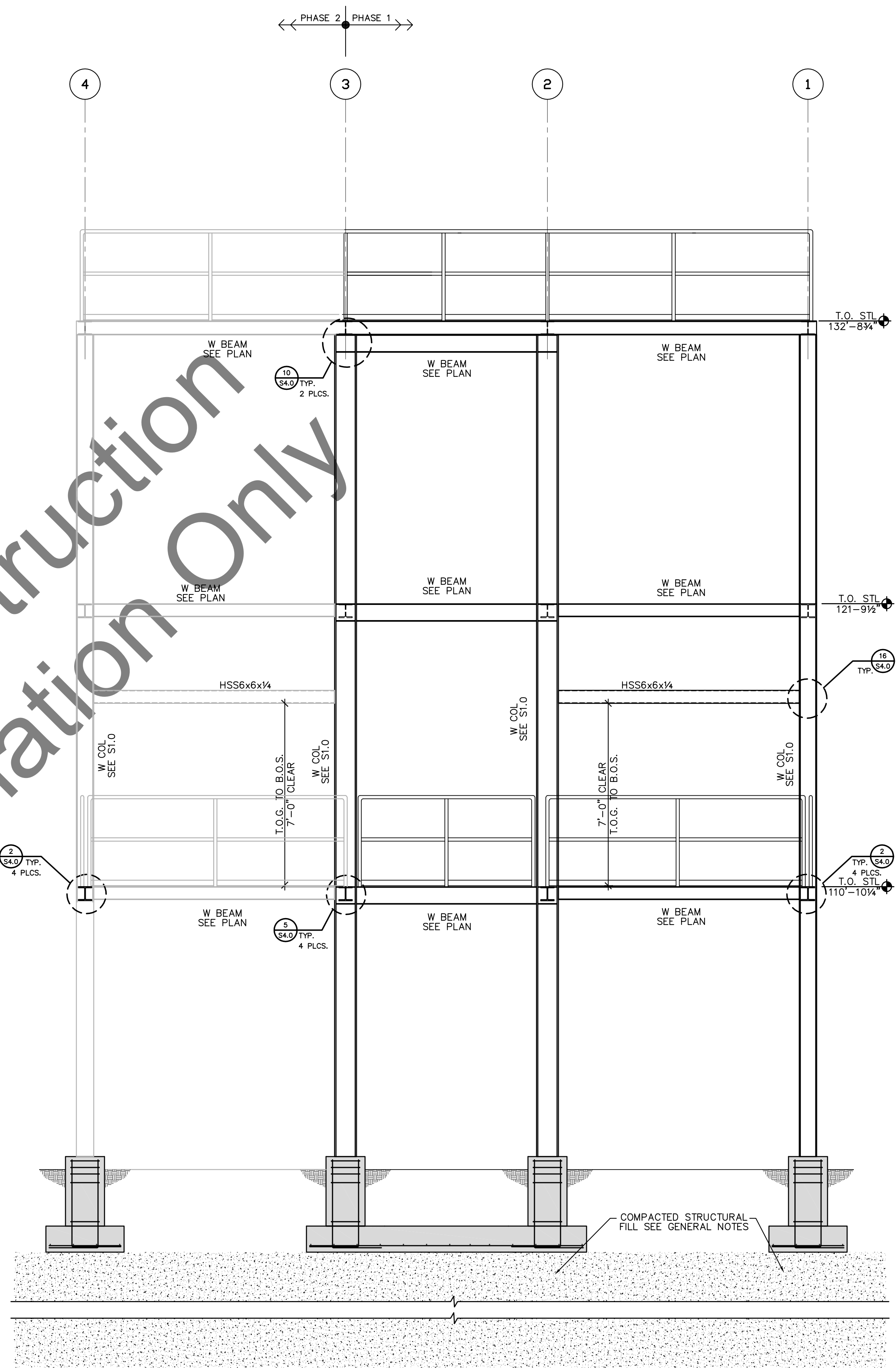
SHEET TITLE
TOWER ELEVATIONS

DATE
05/15/08

SHEET No.
S2.0
5 OF 12



1 FRONT TOWER ELEVATION
SCALE: 3/8"=1'-0"



2 BACK TOWER ELEVATION
SCALE: 3/8"=1'-0"

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REGION ONE

FILE No.

USDA FOREST SERVICE

RAPPEL TOWER

AERIAL FIRE DEPOT

MISSOULA, MONTANA

DESIGNED BY
JDG

DRAWN BY
KAR

CHECKED BY
DEH

SHEET TITLE

TOWER
ELEVATIONS

DATE

05/15/08

SHEET No.

S2.1

6 OF 12

STRUCTURAL LEGEND	
S.J.	INDICATES APPROXIMATE LOCATION OF SLAB JOINT.
	APPROXIMATE LOCATION OF STEPPED FOOTING.
	INDICATES FOOTING MARK NUMBER.
	INDICATES HOLDDOWN LOCATION.
	INDICATES COLUMN MARK NUMBER.
	INDICATES WALL MARK NUMBER.
	INDICATES SHEAR WALL MARK NUMBER.
	INDICATES UNIT LOCATIONS IN CMU WALLS OR HEADERS IN STEEL & WOOD STUD WALLS.
	INDICATES APPROXIMATE WEIGHT & LOCATION OF MECHANICAL UNIT. SEE MECHANICAL DRAWINGS
	INDICATES SPAN DIRECTION OF METAL DECK.
	INDICATES SPAN DIRECTION & TYPE OF METAL DECK.
	TOP OF FOOTING ELEVATION
	TOP OF CONCRETE SLAB ELEVATION
	TOP OF WALL ELEVATION
	JOIST BEARING ELEVATION
	FINISH FLOOR ELEVATION
UNO	UNLESS NOTED OTHERWISE
	SECTION
	ELEVATION
	DETAIL

GENERAL

THIS PROJECT IS TO CONFORM TO THE THIRTEENTH EDITION OF THE AISC STEEL CONSTRUCTION MANUAL, OSHA 1910 & ASCE 7-05, USE DETAILS MARKED "TYPICAL" WHEREVER THEY APPLY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AT THE SITE BEFORE PROCEEDING. CHANGES, OMISSIONS OR SUBSTITUTIONS NOT PERMITTED WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT AND STRUCTURAL ENGINEER. THESE CONDITIONS INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY BRACING, SHORING, OR PRE-LOADING REQUIRED DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REGULATIONS. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING CONSTRUCTION LOADS TO 20 PSF.

SHOP DRAWINGS

SHOP DRAWINGS TO BE CHECKED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTING FOR REVIEW.

DESIGN LOADS

ROOF LIVE LOAD	=	32 PSF (SNOW)
FLOOR LIVE LOAD	=	100 PSF
STAIR LIVE LOAD	=	100 PSF, 1000 LBS. MOVING CONCENTRATED LOAD
BASIC WIND SPEED	=	90 MPH, EXPOSURE C
SEISMIC LOADING PER ASCE 7-05	=	DESIGN CATEGORY D
		SITE CLASS
		IMPORTANCE FACTOR 1.0
		USE GROUP U
		SDS= 52%, SD1= 26.7%

FOUNDATIONS

FOOTING BEARING PRESSURES ARE LIMITED TO 2500 PSF PER SOILS REPORT PREPARED BY STRATA GEOTECHNICAL ENGINEERING AND MATERIALS TESTING DATA DATED SEPTEMBER 7, 2007. FOOTINGS ARE TO BEAR A MINIMUM OF 3'-0" BELOW FINISH GRADE UNLESS OTHERWISE SHOWN ON THE DRAWINGS. BOTTOM OF ALL FOOTINGS TO BEAR ON A MINIMUM OF 2'-0" OF SELECT, COMPACTED, STRUCTURAL FILL PLACED ON GEOTEXTILE. EXCAVATION OF EXISTING UNCONTROLLED FILL WILL BE NECESSARY. SEE SOILS REPORT FOR SOILS REPORT FOR REQUIREMENTS.

CAST-IN-PLACE CONCRETE

ATTAIN A MINIMUM 28 DAY COMPRESSION STRENGTH OF 2500 PSI FOR FOOTINGS AND PIERS, 3000 PSI FOR SLABS. PROVIDE MAXIMUM SLUMPS AS FOLLOWS: 3" FOR FOOTINGS; 4" FOR PIERS. CONSTRUCTION TO BE IN ACCORDANCE WITH ACI 318 "PART 2 - STANDARDS FOR TESTS AND MATERIALS" AND "PART 3 - CONSTRUCTION REQUIREMENTS".

REINFORCEMENT

USE DEFORMED STEEL BARS CONFORMING TO ASTM A615 GRADE 60 EXCEPT #3 BARS, STIRRUPS, TIES, AND FIELD BENT DOWELS WHICH SHALL BE GRADE 40. REINFORCEMENT TO BE WELDED SHALL BE ASTM A706 GRADE 60. REINFORCING IS TO BE SUPPORTED ON CHAIRS OR CONCRETE BRICKS AND SECURELY TIED IN PLACE. PROVIDE CLEAR COVER AS SHOWN ON PLANS OR AS FOLLOWS: FOOTINGS, 3" FROM SOIL; FORMED CONCRETE AGAINST SOIL, 2"; SLABS ON GRADE 2". REINFORCING STEEL SHALL NOT BE WELDED UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE STRUCTURAL ENGINEER. SUBMIT SHOP DRAWINGS OF REINFORCING STEEL FOR REVIEW PRIOR TO FABRICATION.

STRUCTURAL STEEL

STRUCTURAL SHAPES TO CONFORM TO ASTM A588-50, FY = 50 KSI. STRUCTURAL TUBING: ASTM A500, FY=46 KSI; STEEL PIPE: ASTM A847, FY=50 KSI. MISCELLANEOUS CONNECTION PLATES, ANGLES AND CHANNELS TO CONFORM TO ASTM A588, FY=50 KSI MINIMUM. STEEL IS TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL BUILDINGS". WELDING IS TO BE PERFORMED BY AWS CERTIFIED WELDERS USING E7018 ELECTRODES. 2700 HCHT MINIMUM (H.S.). 2700 HCHT MINIMUM (H.S.). AS ASTM A307 (M.B.). ANCHOR RODS (A.R.): ASTM A307, EXPANSION BOLTS IN CONCRETE (E.B.): ITW RAMSET/REDHEAD "TRUBOLT" (ANCHOR ROD NO. ER-1372) OR APPROVED EQUAL. ADHESIVE ANCHORS (A.A.): ITW RAMSET/REDHEAD "ADHESIVE ANCHOR" (ANCHOR ROD NO. ER-1372) OR APPROVED EQUAL. POWDER ACTUATED FASTENERS (P.A.F.): ITW RAMSET/REDHEAD POWDER ACTUATED FASTENERS (ICBO REPORT NO. 1639) OR APPROVED EQUAL. INSTALL EXPANSION BOLTS, ADHESIVE ANCHORS, AND POWDER ACTUATED FASTENERS PER MANUFACTURERS' RECOMMENDATIONS. ALL ANCHOR RODS SHALL BE CAST-IN-PLACE. PROVIDE TEMPORARY BOLTING AND CONNECTIONS AS REQUIRED TO COMPLY WITH OSHA REGULATIONS. NO FIELD WELDING WILL BE ALLOWED WITHOUT APPROVAL OF CONTRACTING OFFICE. ALL WELDS SHALL BE WELDED IN ACCORDANCE WITH THE WELDING DETAIL SHEET PRIOR TO FABRICATION. ALL COLUMNS AND BEAMS TO BE FROM UNSPLINED LENGTHS UNLESS OTHERWISE NOTED ON THE DRAWINGS. PREFABRICATED RAILINGS AND STAIRS MAY BE USED WHEN APPROVED BY THE CONTRACTING OFFICER.

180°

DETAILING DIMENSION

HOOK A OR G

d_b = BAR DIAMETER

D = FINISHED INSIDE BEND DIAMETER

$D = 6d_b$	FOR #3 THROUGH #8
$D = 8d_b$	FOR #9, #10 AND #11
$D = 10d_b$	FOR #14 AND #18

90°

DETAILING DIMENSION

HOOK A OR G

$12d_b$

90°

DETAILING DIMENSION

HOOK A OR G

d_b

D = BEND DIAMETER

135°

DETAILING DIMENSION

HOOK A OR G

d_b

D = BEND DIAMETER

STANDARD HOOK DETAILS									
BAR SIZE	DIMENSIONS OF STANDARD 180° HOOK, ALL GRADES					DIMENSIONS OF STANDARD 90° HOOKS, ALL GRADES			
	A	O	G	J	D	A	O	G	D
#3	5"			3"	2¼"	6"			2¼"
#4	6"			4"	3"	6"			3"
#5	7"			5"	3¾"	10"			3¾"
#6	8"			6"	4½"	11'-0"			4½"
#7	10"			7"	5¼"	1'-2"			5¼"
#8	11"			8"	6"	1'-4"			6"

STIRRUP HOOK DETAILS (TIE BENDS SIMILAR)						
BAR SIZE	Ø	90°		135°		
		A	O R G	A	O R G	APPROX. H
#3	1 1/4"	4"		4"		2 1/2"
#4	2"	4 1/2"		4 1/2"		3"
#5	2 1/2"	6"		5 1/2"		3 1/2"
#6	4 1/2"	1'-0"		8"		4 3/4"
#7	5 1/4"	1'-2"		9"		5 1/4"
#8	6"	1'-4"		10 1/2"		6"

COLUMN SIZE SCHEDULE	
MARK	SIZE
(C1)	W8x31
(C2)	W10x45

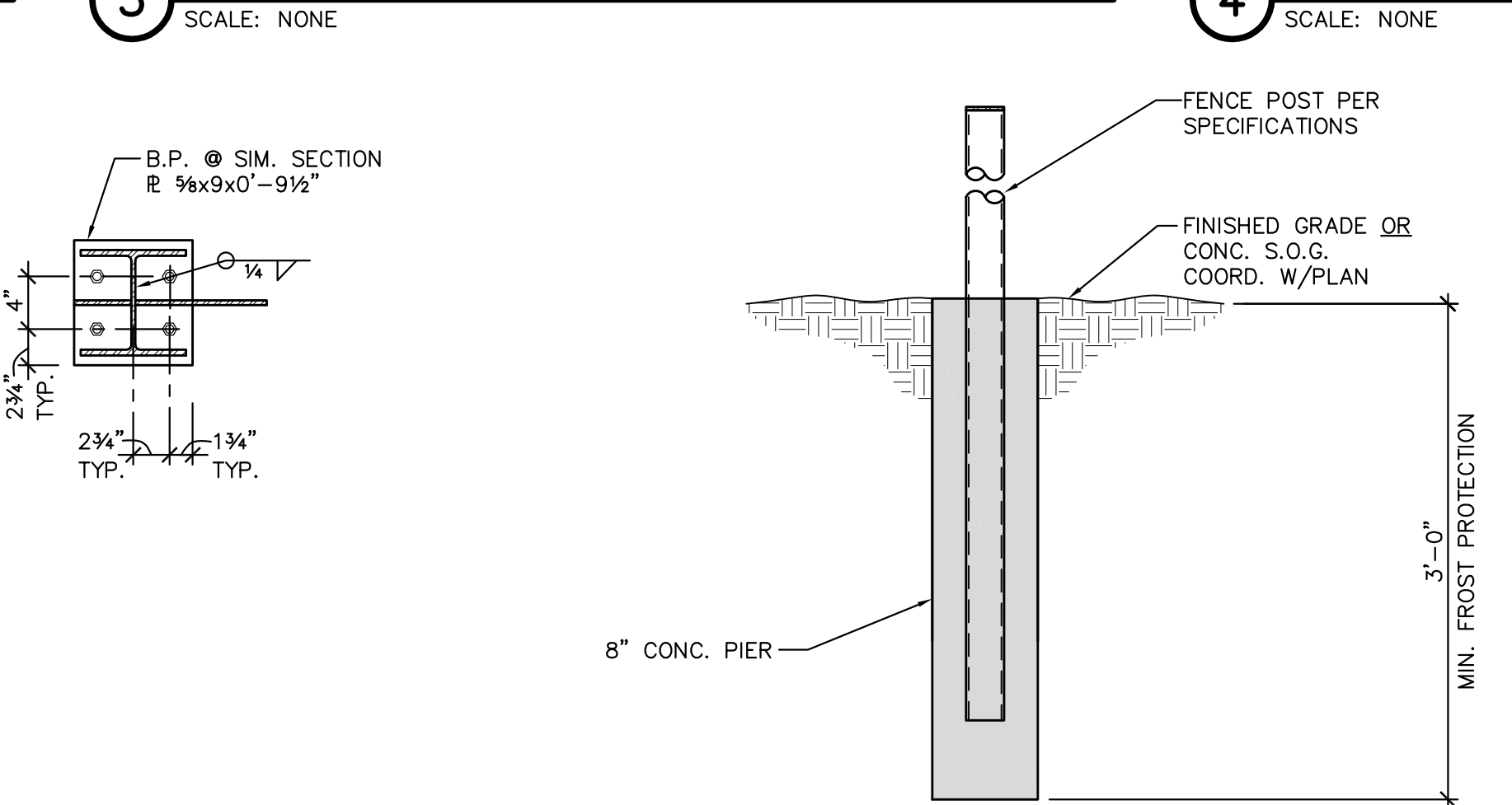
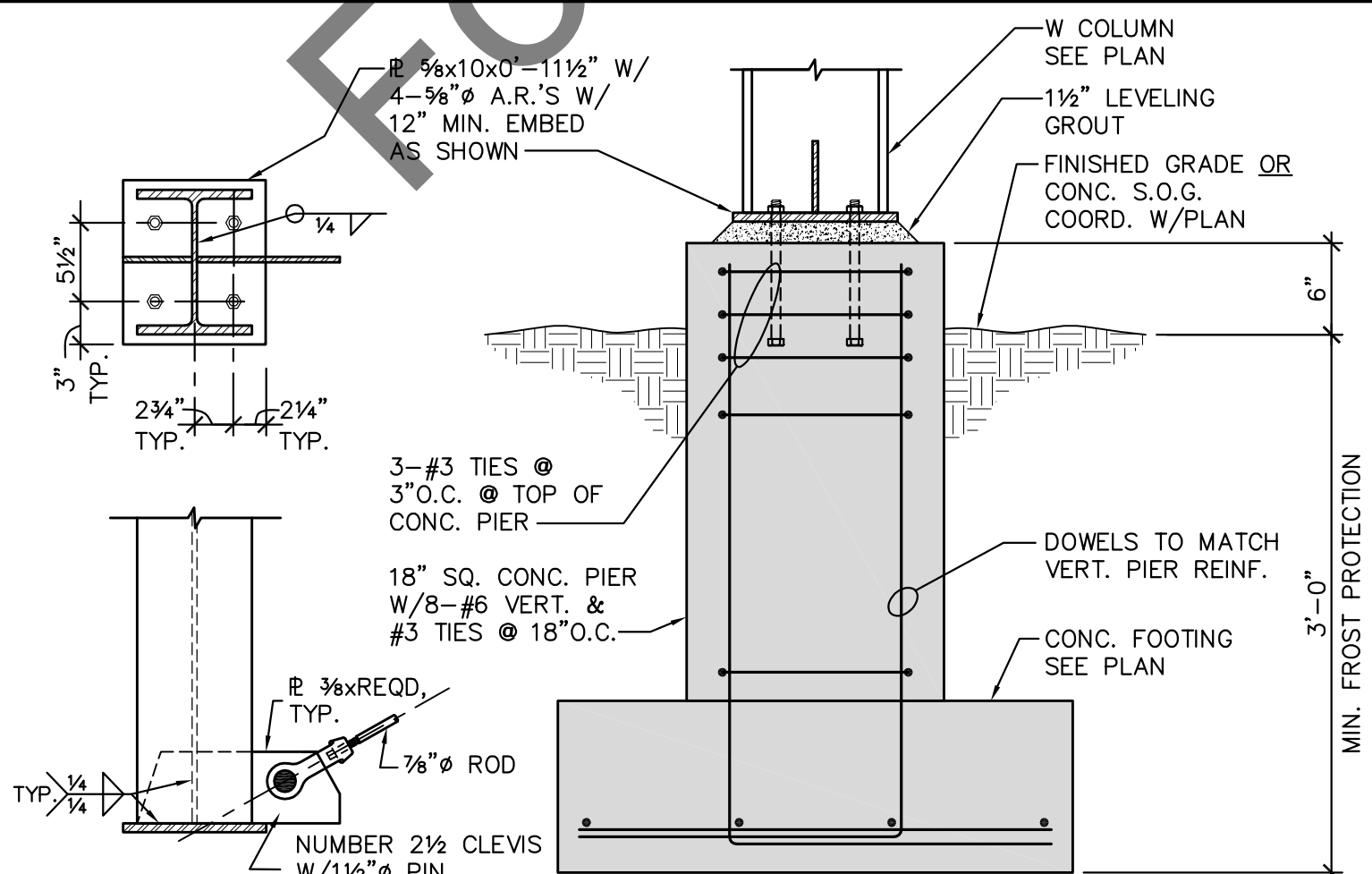
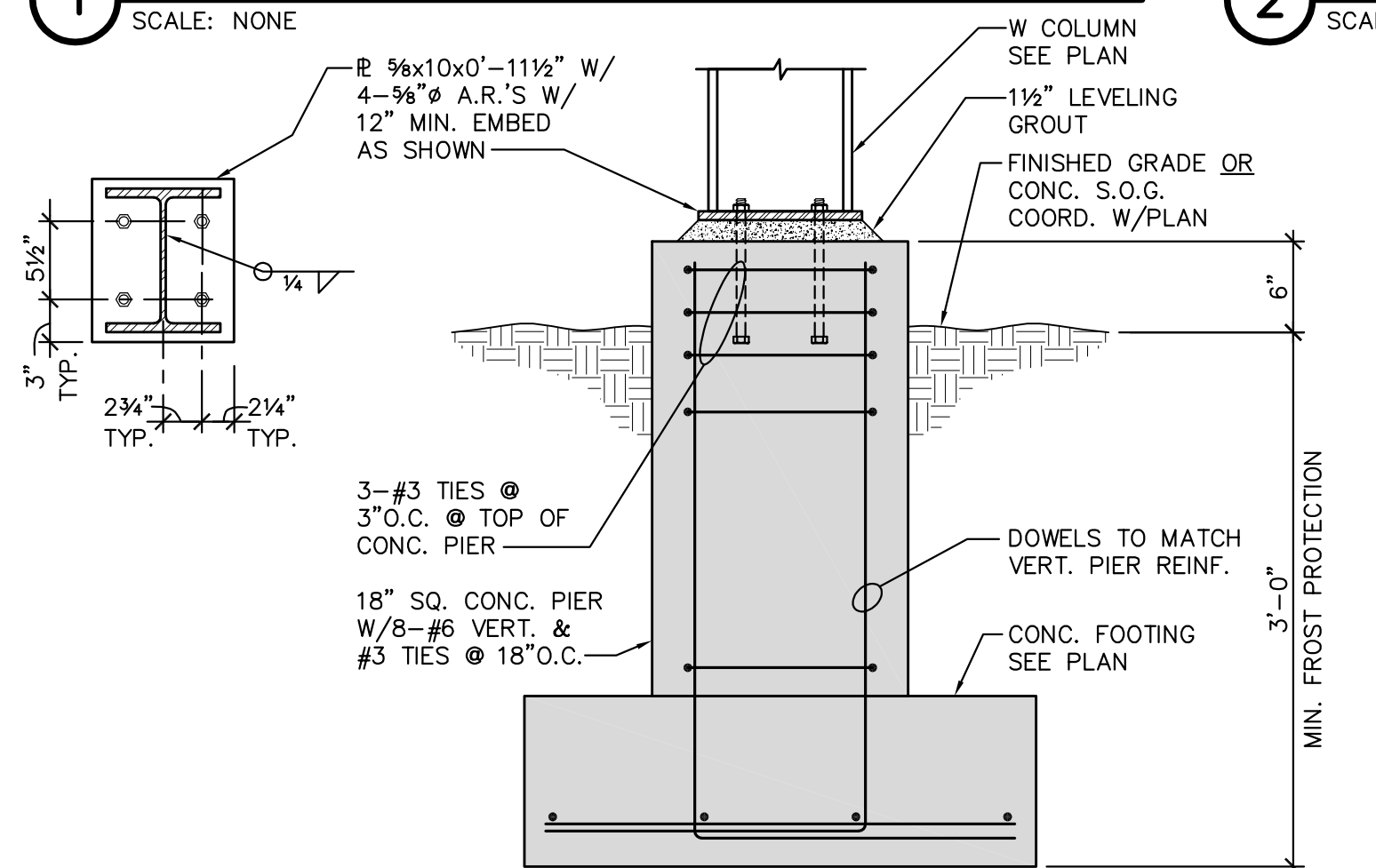
SCHEDULE

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SCALE: NONE

SCALE: NONE

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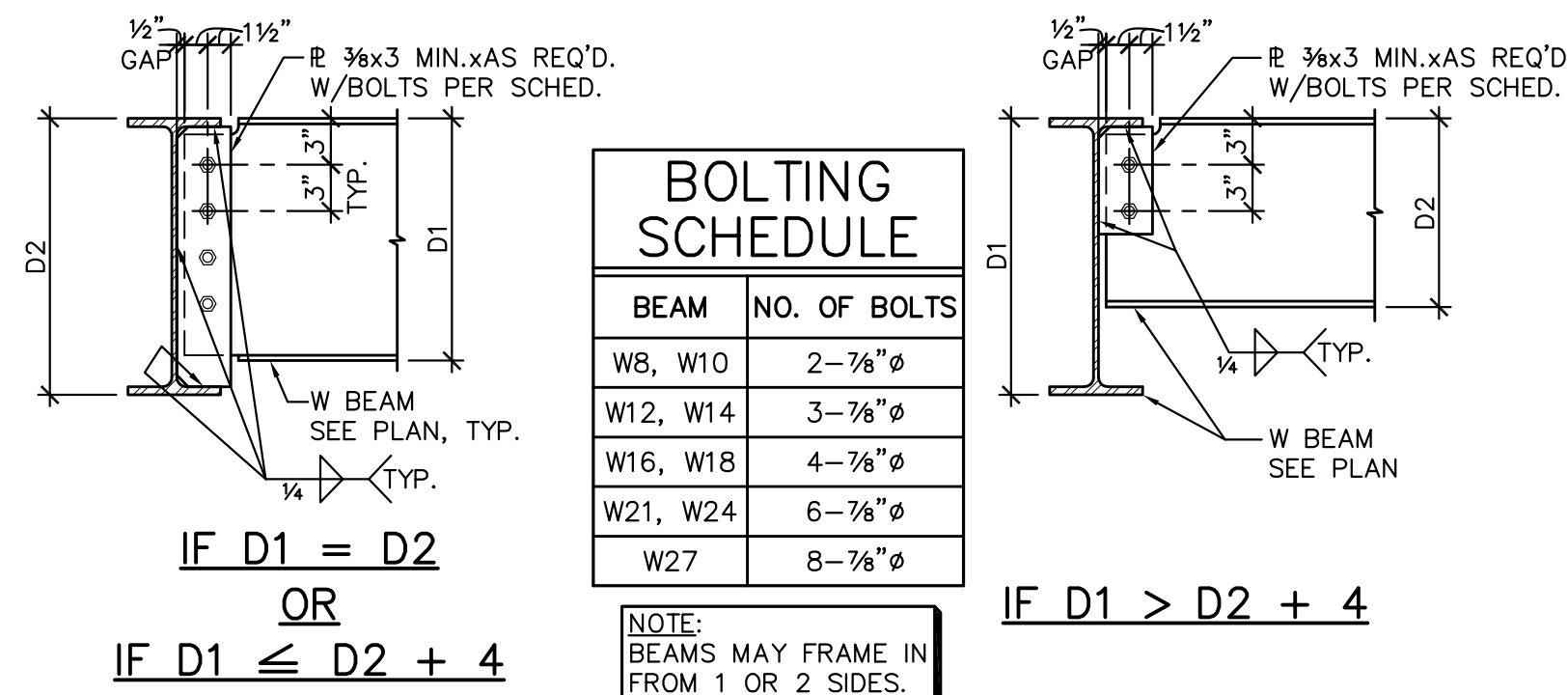


7 TYP. PIER FOUNDATION @ FENCE POST

SCALE: 1"=1'-0"

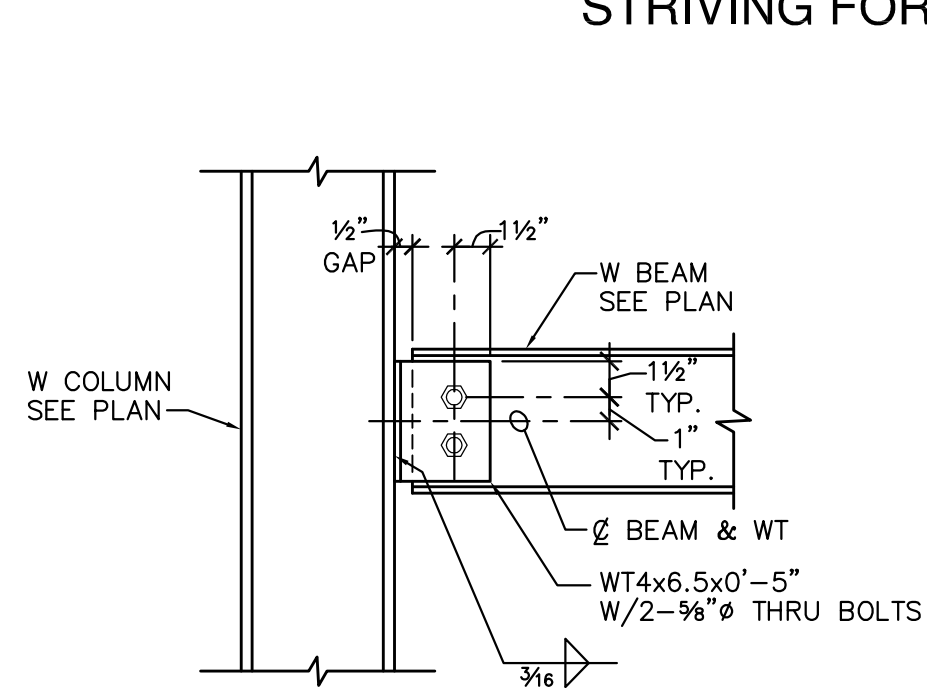
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SCALE: 1"=1'-0"



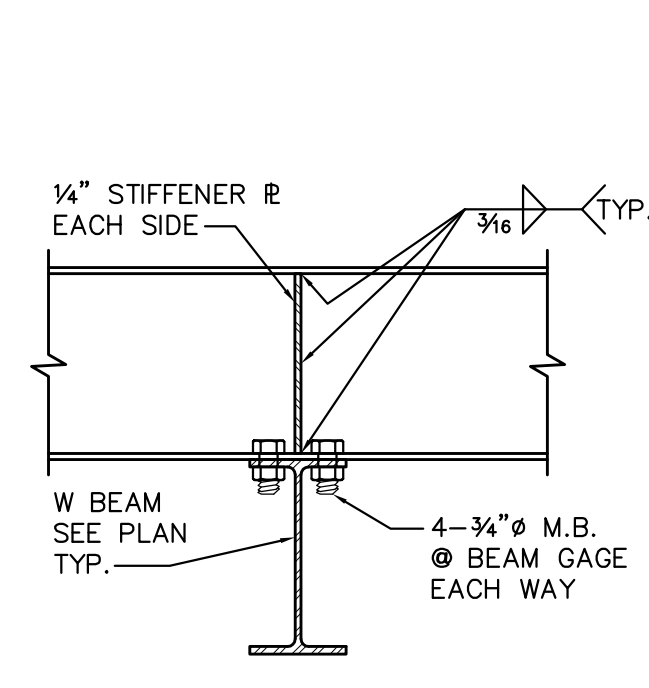
1 TYP. BEAM TO BEAM CONN.

SCALE: 1"=1'-0"



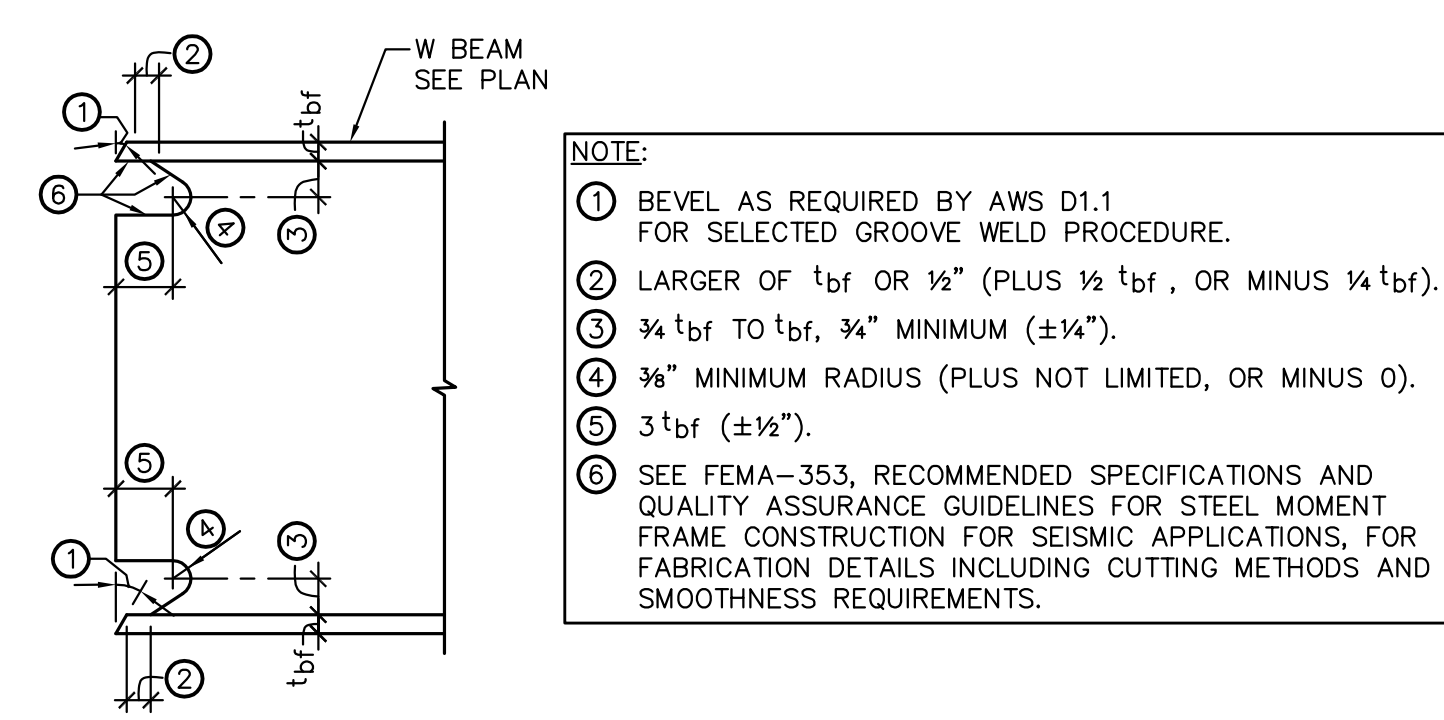
2 TYP. BEAM TO COLUMN CONN.

SCALE: 1 1/2"=1'-0"



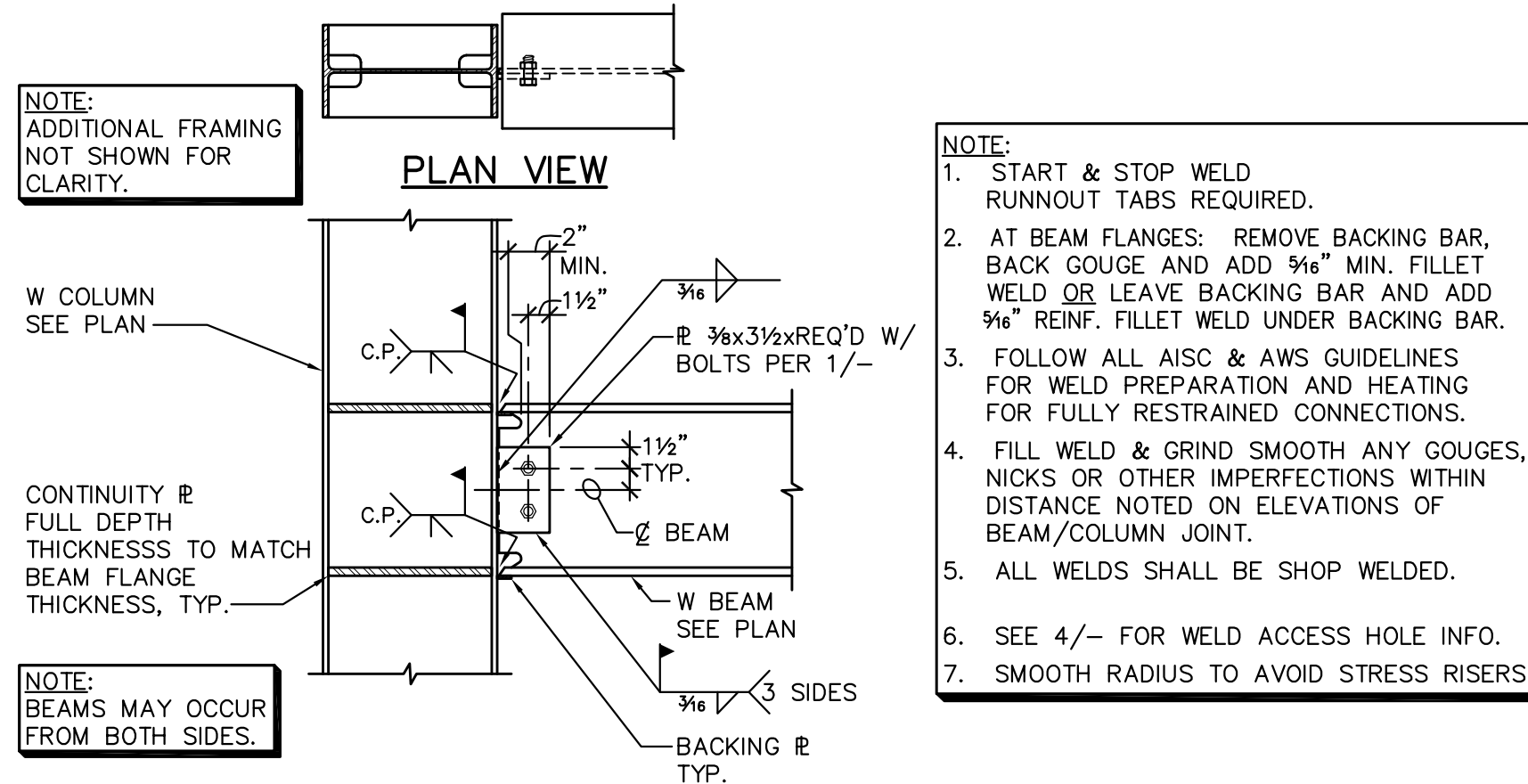
3 TYP. BEAM TO BEAM CONN.

SCALE: 1 1/2"=1'-0"



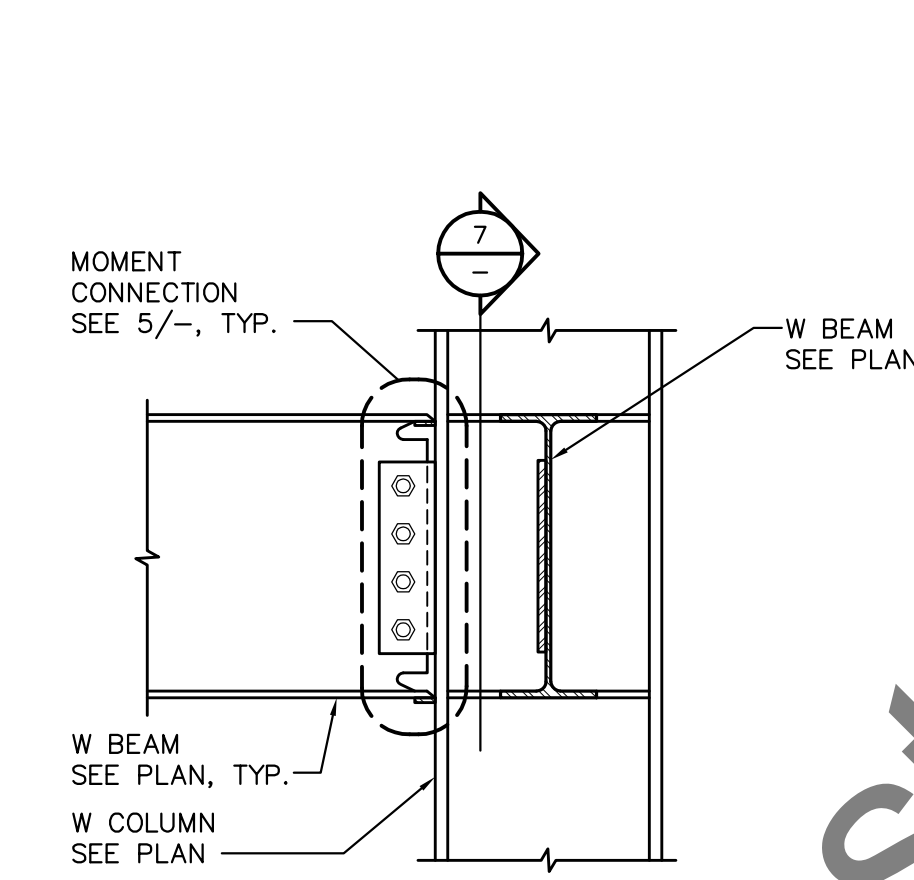
4 WELD ACCESS HOLE

SCALE: 3"=1'-0"



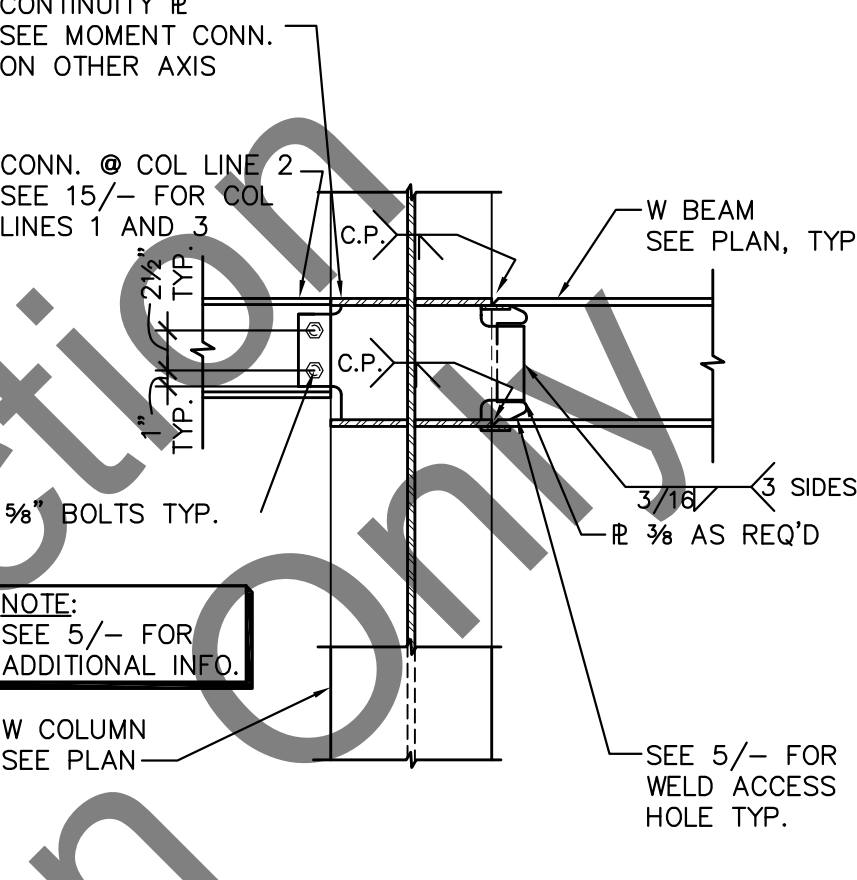
5 MOMENT FRAME CONN.

SCALE: 1"=1'-0"



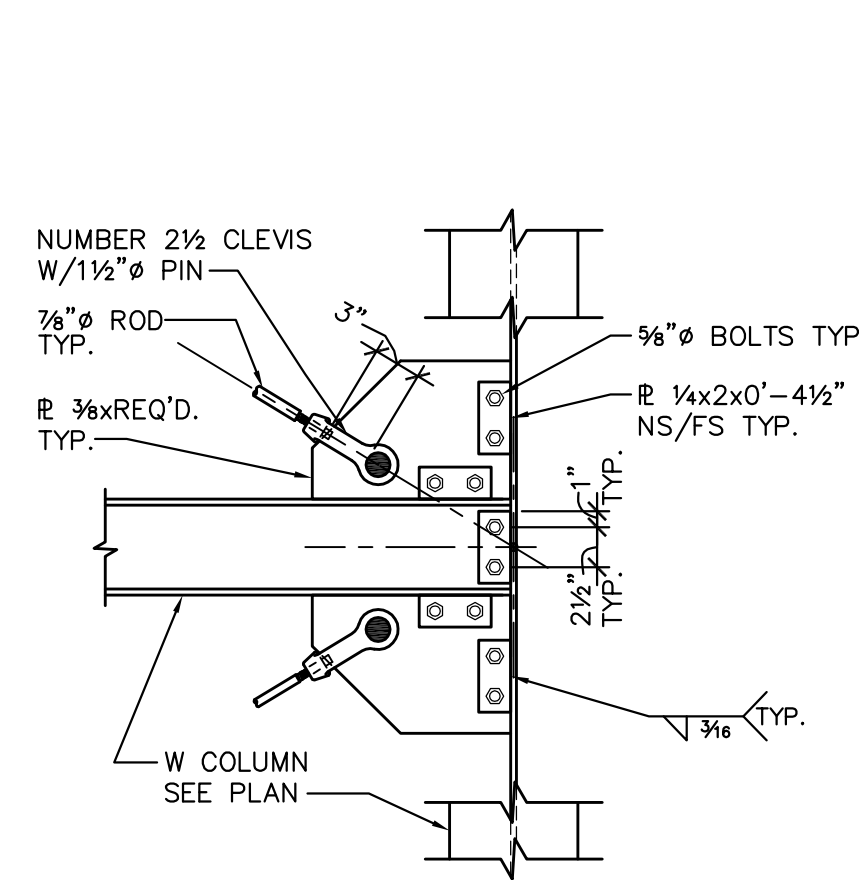
6 MOMENT FRAME CONN.

SCALE: 1"=1'-0"



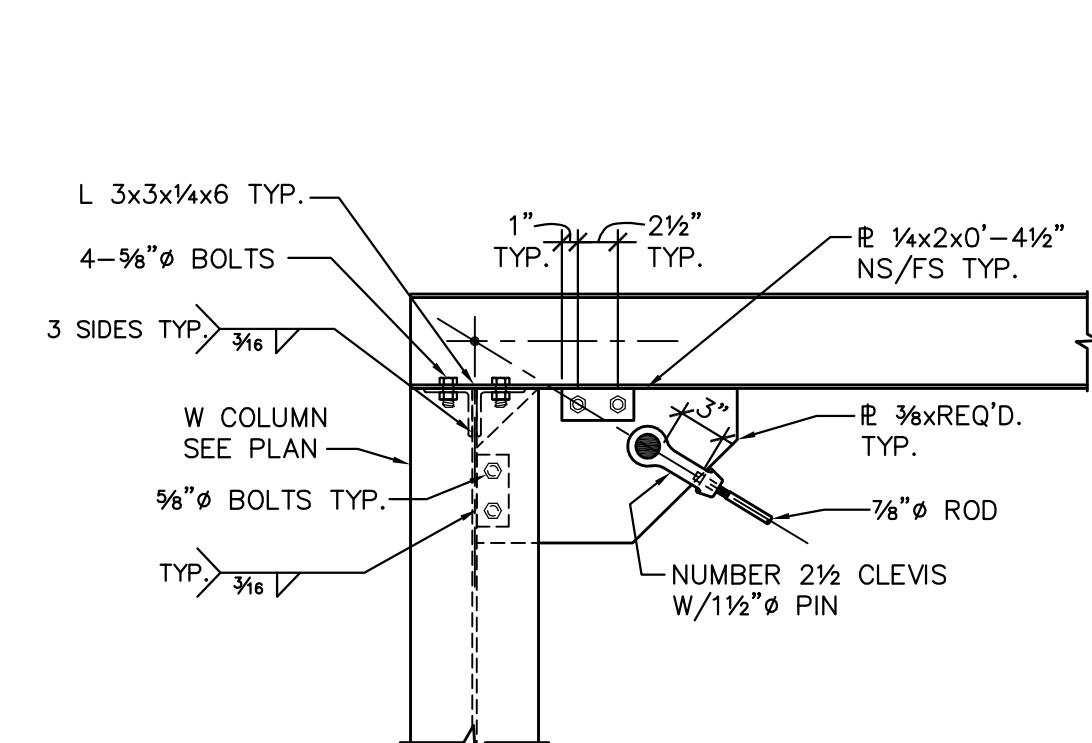
7 MOMENT CONN.

SCALE: 1"=1'-0"



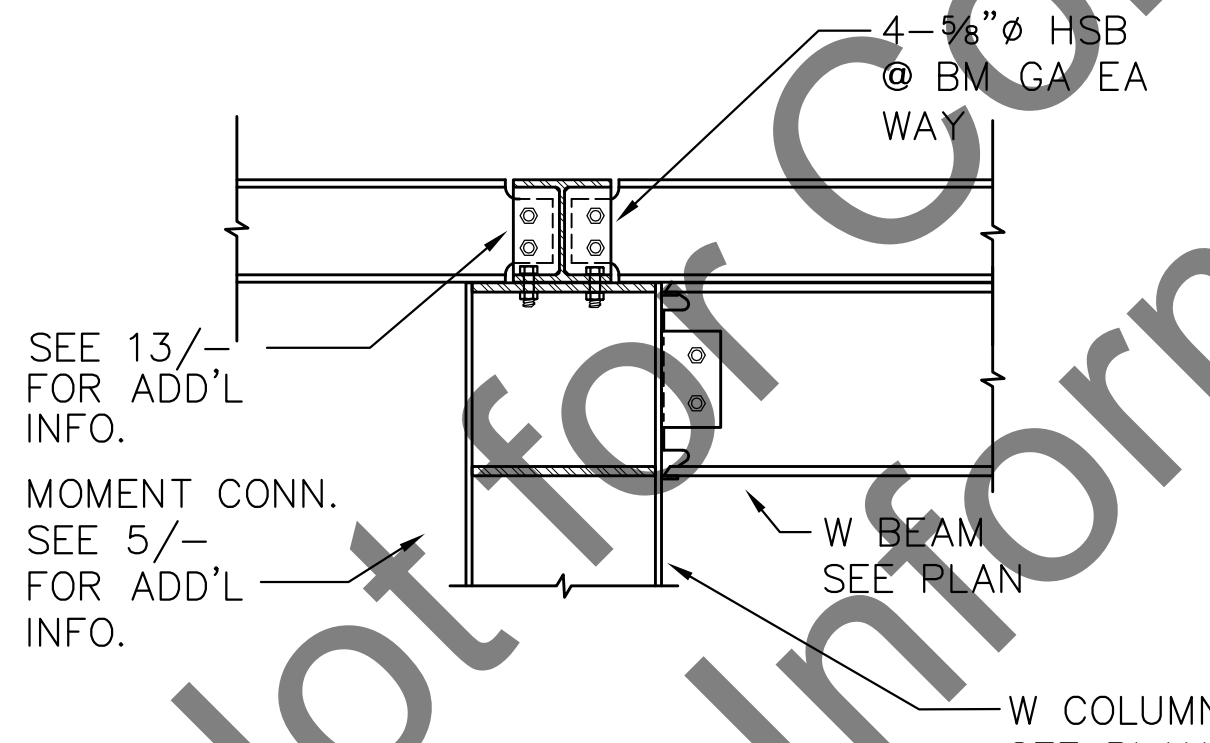
8 BRACING CONN.

SCALE: 1"=1'-0"



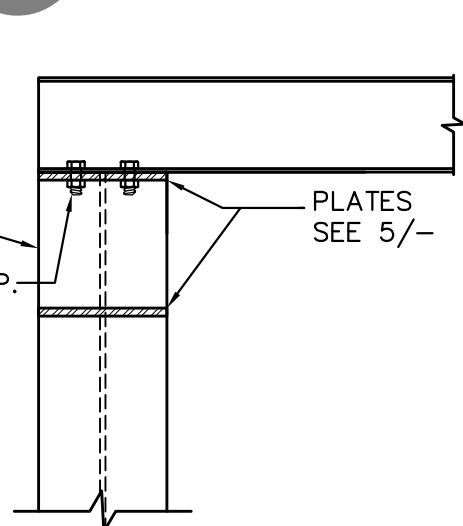
9 TYP. BRACING CONN.

SCALE: 1"=1'-0"



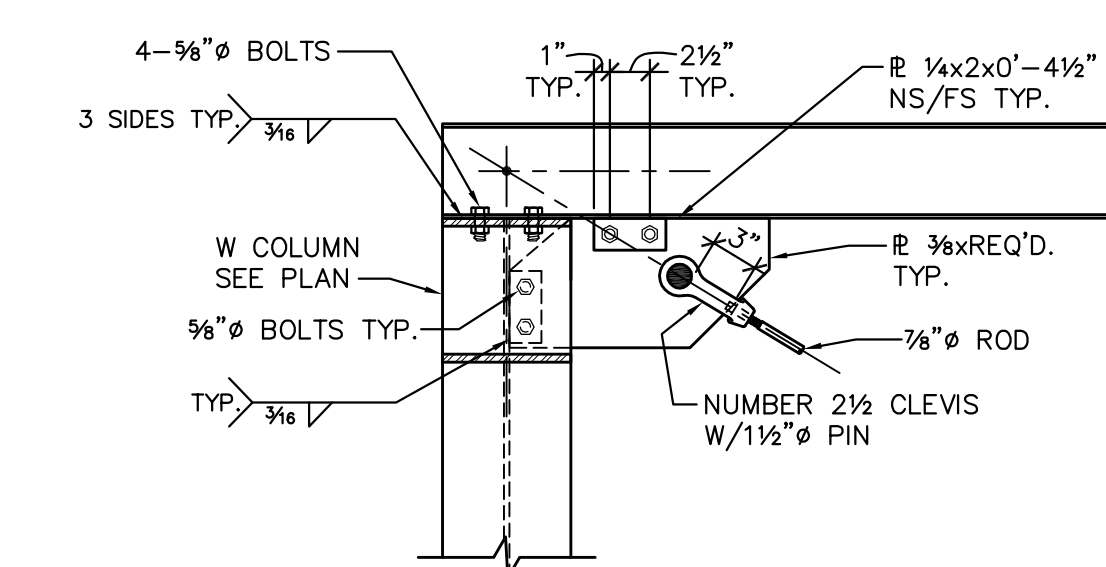
10 MOMENT FRAME CONN.

SCALE: 1"=1'-0"



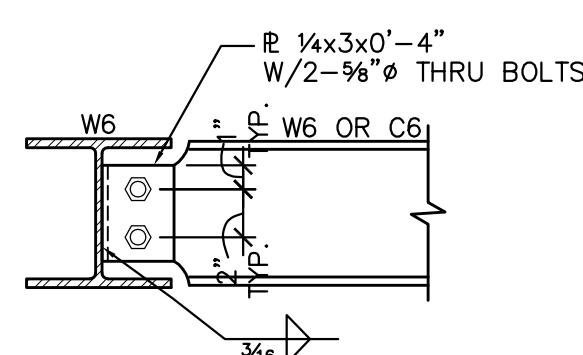
11 BEAM TO COLUMN CONN.

SCALE: 1"=1'-0"



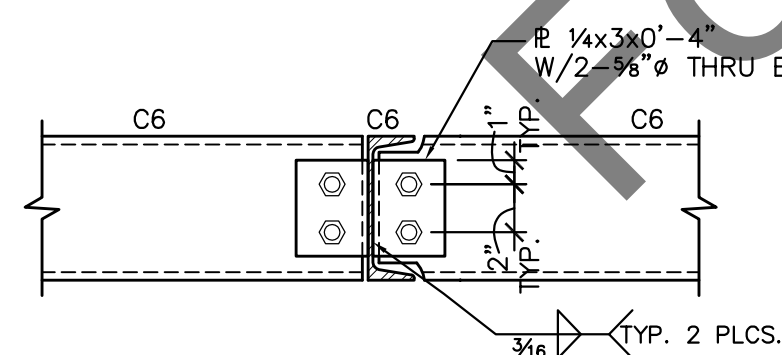
12 BRACING CONN.

SCALE: 1"=1'-0"



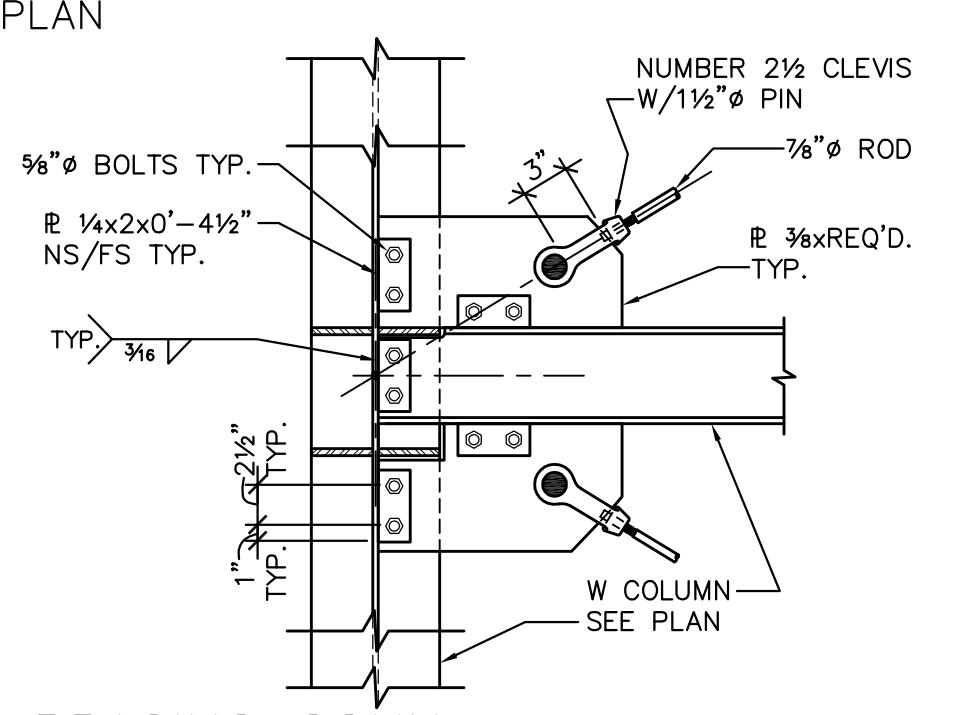
13 TYP. BEAM TO BEAM CONN.

SCALE: 1 1/2"=1'-0"



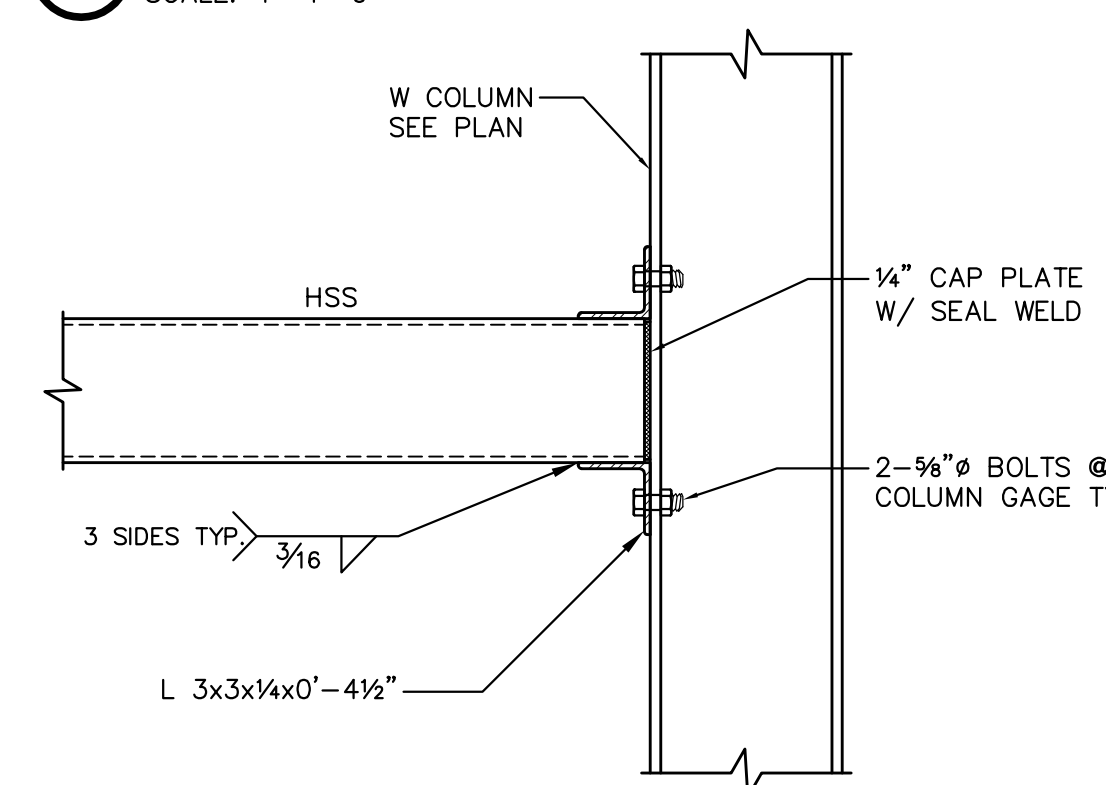
14 TYP. BEAM TO BEAM CONN.

SCALE: 1 1/2"=1'-0"



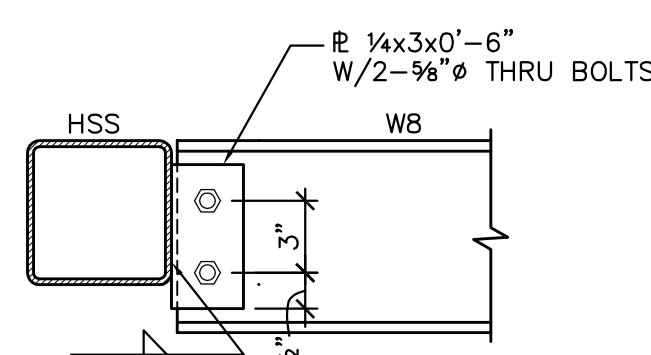
15 BRACING CONN.

SCALE: 1"=1'-0"



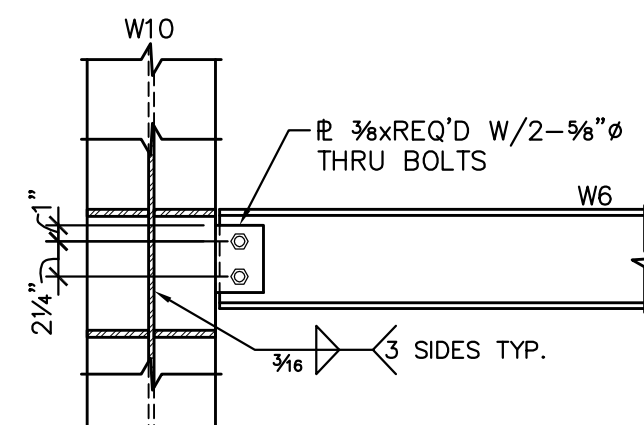
16 TYP. BEAM TO COLUMN CONN.

SCALE: 1 1/2"=1'-0"



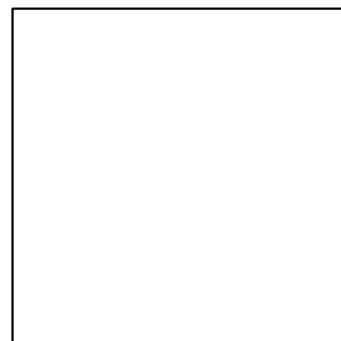
17 TYP. BEAM TO BEAM CONN.

SCALE: 1 1/2"=1'-0"



18 COLUMN TO BEAM CONN.

SCALE: 1"=1'-0"



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FILE NO.

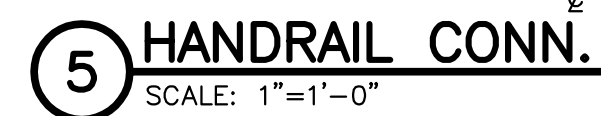
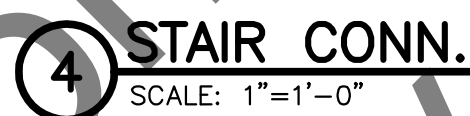
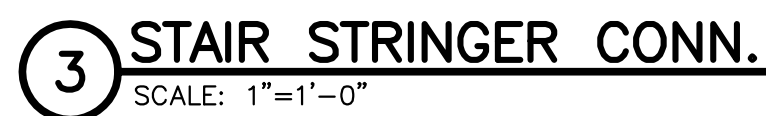
USDA FOREST SERVICE
RAPPEL TOWER
AERIAL FIRE DEPOT
MISSOULA, MONTANA

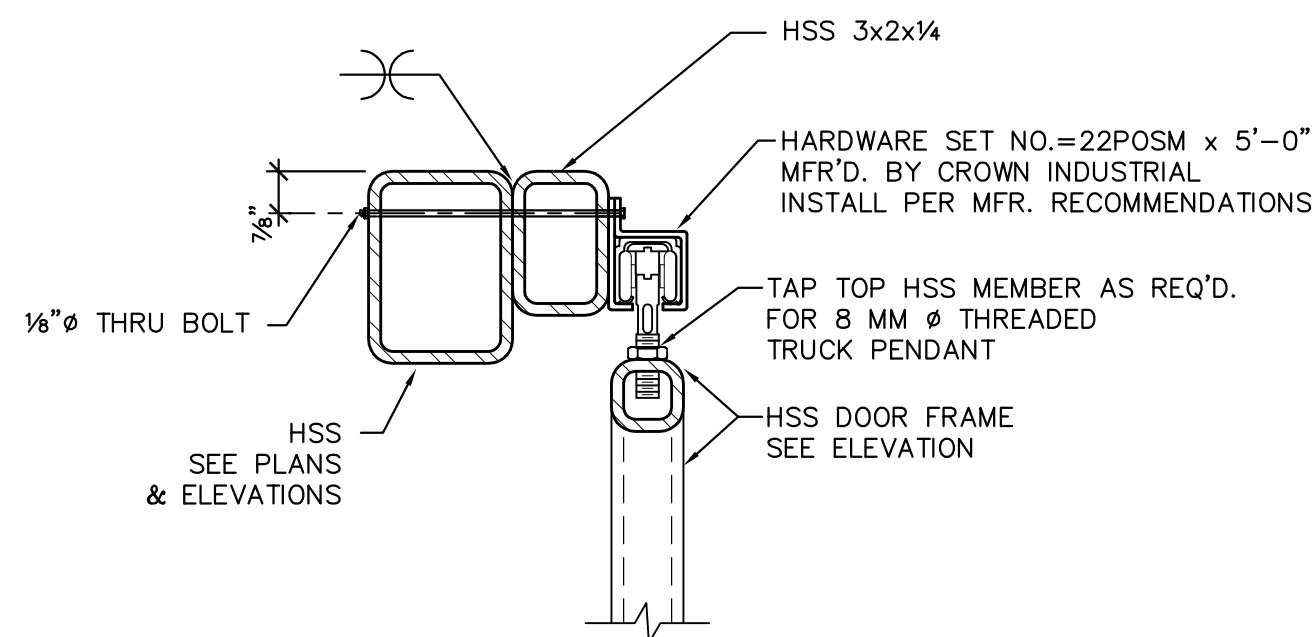
DESIGNED BY
JDC
DRAWN BY
KAR
CHECKED BY
DEH

SHEET TITLE
FRAMING
DETAILS

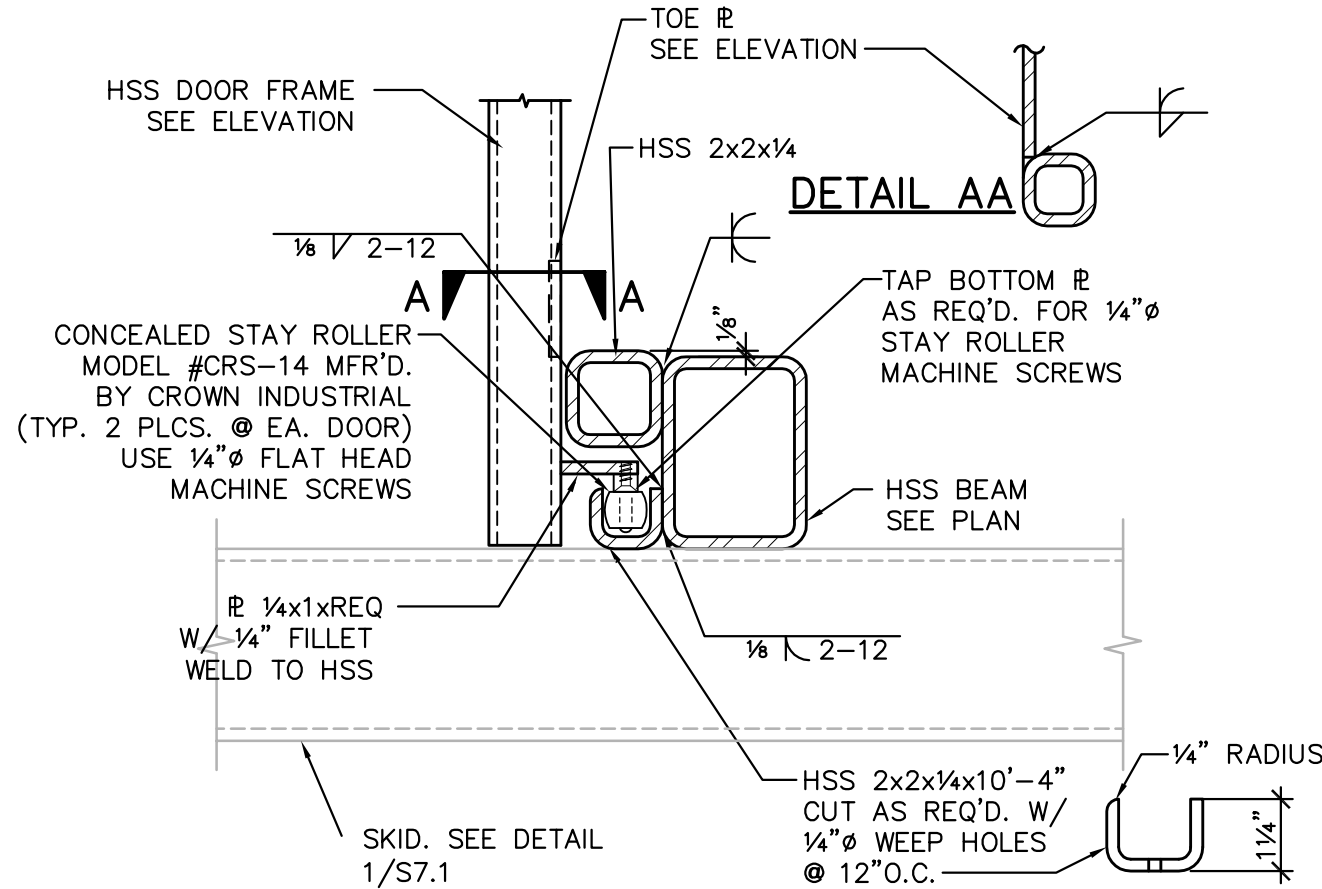
DATE
05/15/08

SHEET No.
S4.0
8 OF 12

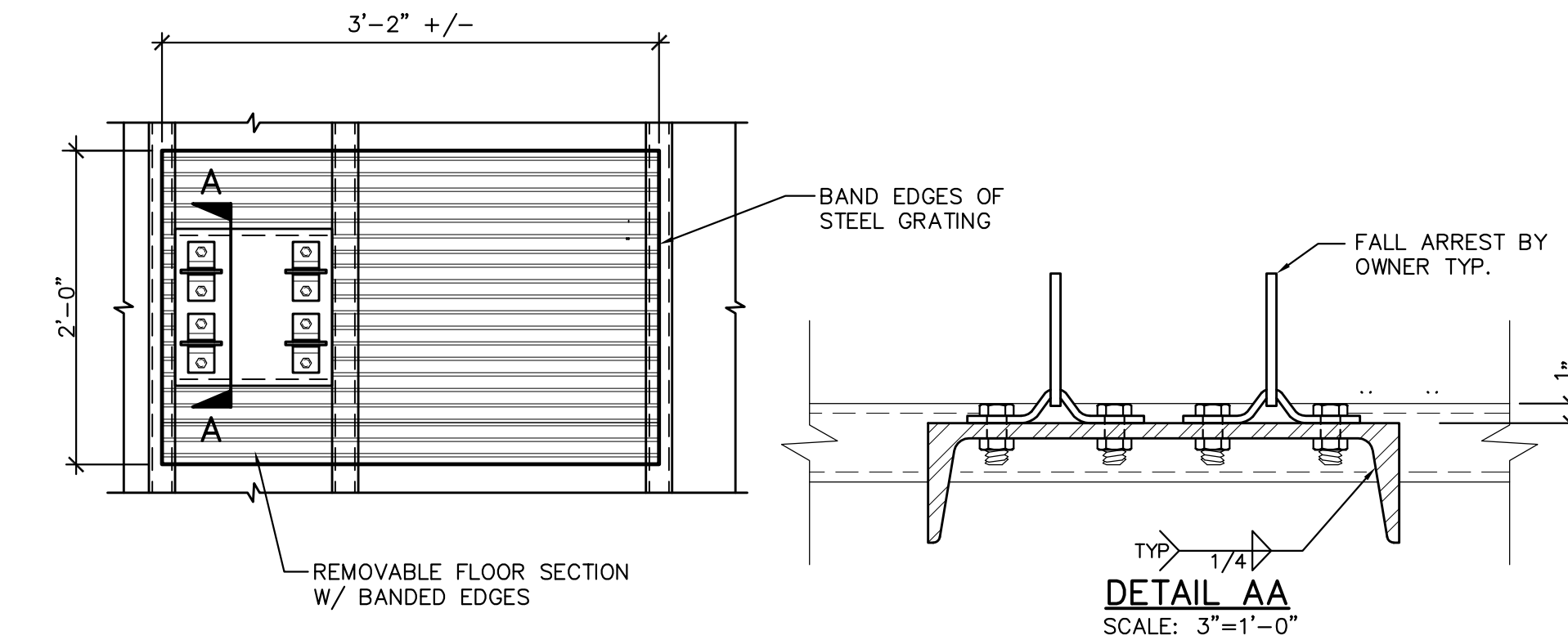




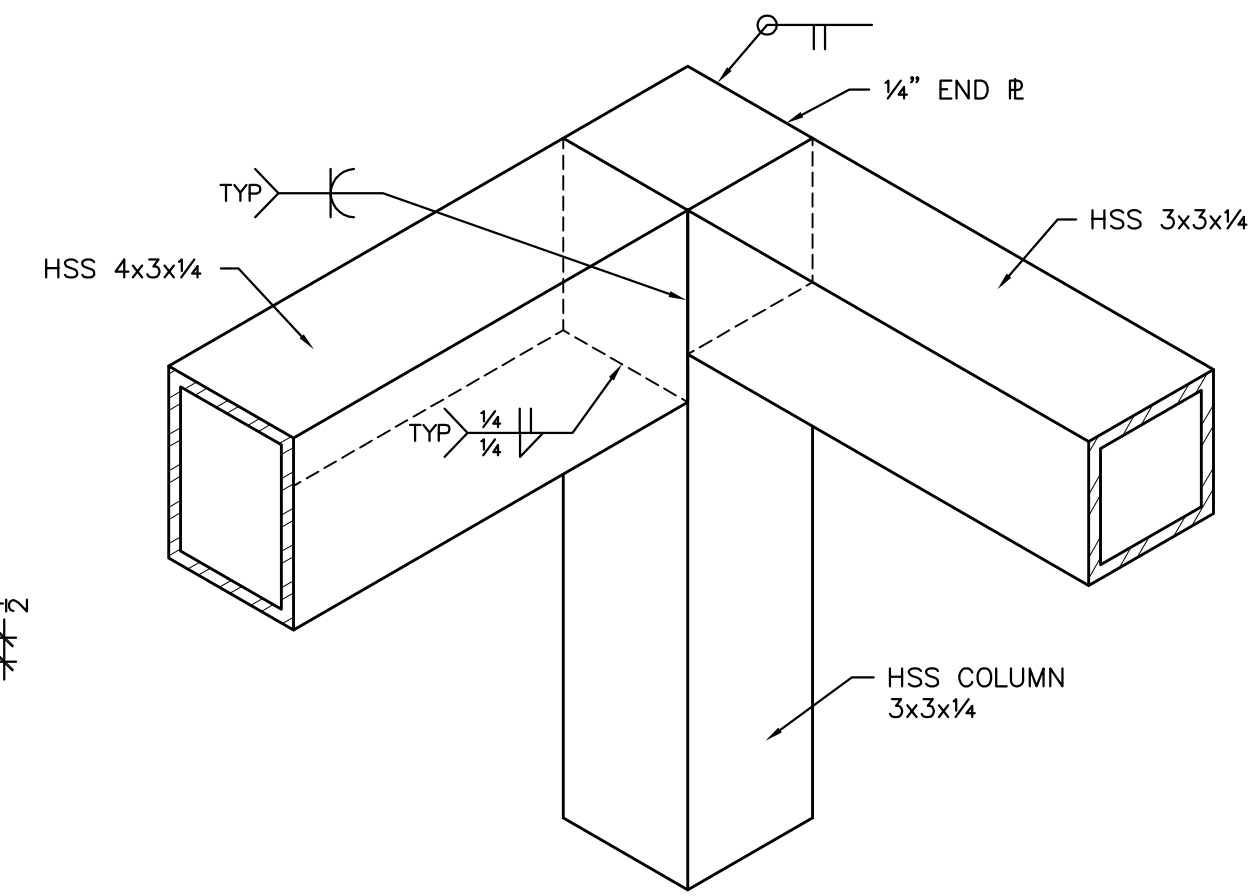
1 SLIDING DOOR TOP CONNECTION
SCALE: 1"=1'-0"



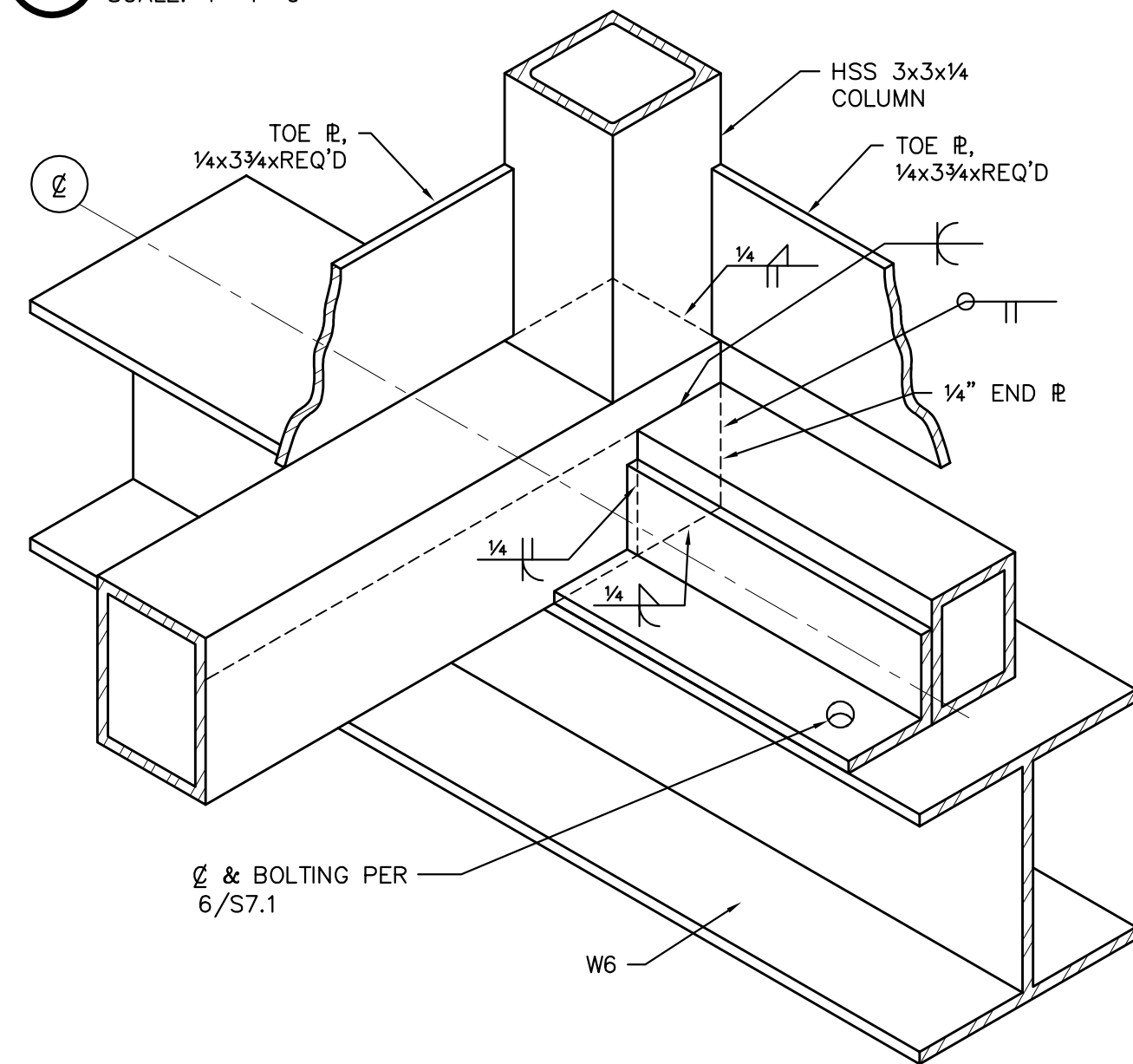
2 SLIDING DOOR BOTTOM DETAIL
SCALE: 3"=1'-0"



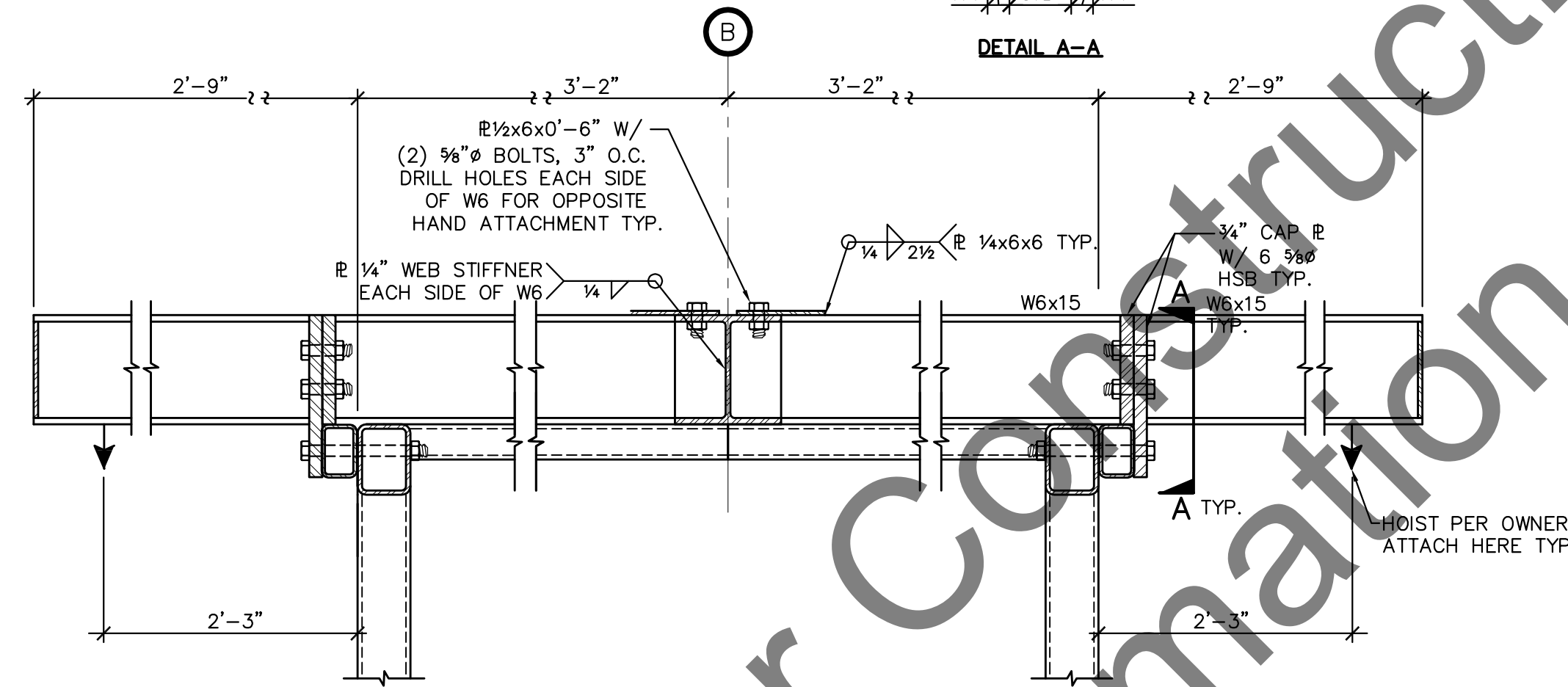
3 SIMULATOR REMOVABLE FLOOR PANEL FRAMING DETAIL
SCALE: 1"=1'-0"



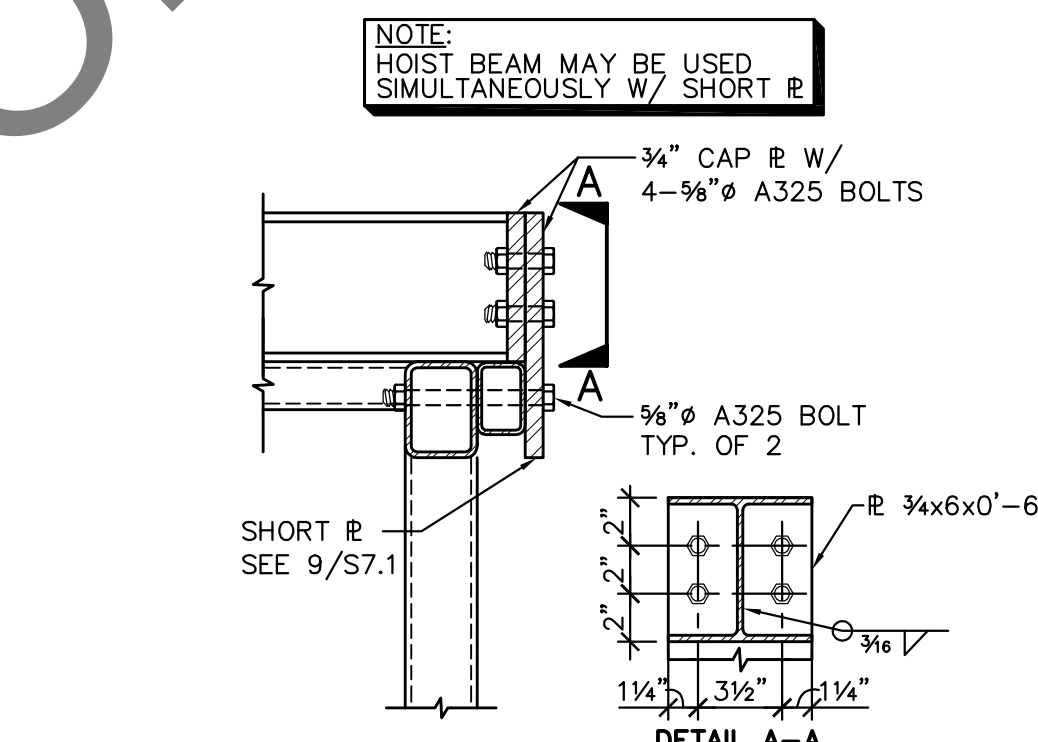
4 CONNECTION DETAIL
SCALE: 3"=1'-0"



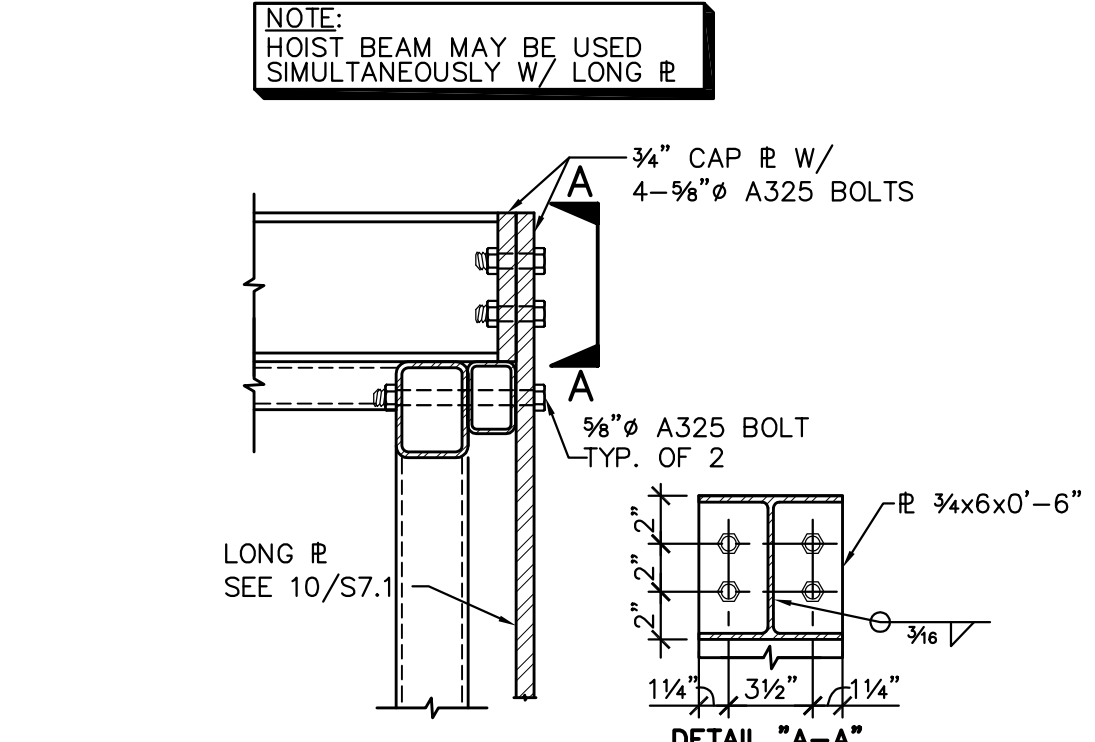
5 CONNECTION EDGE DETAIL
SCALE: 3"=1'-0"



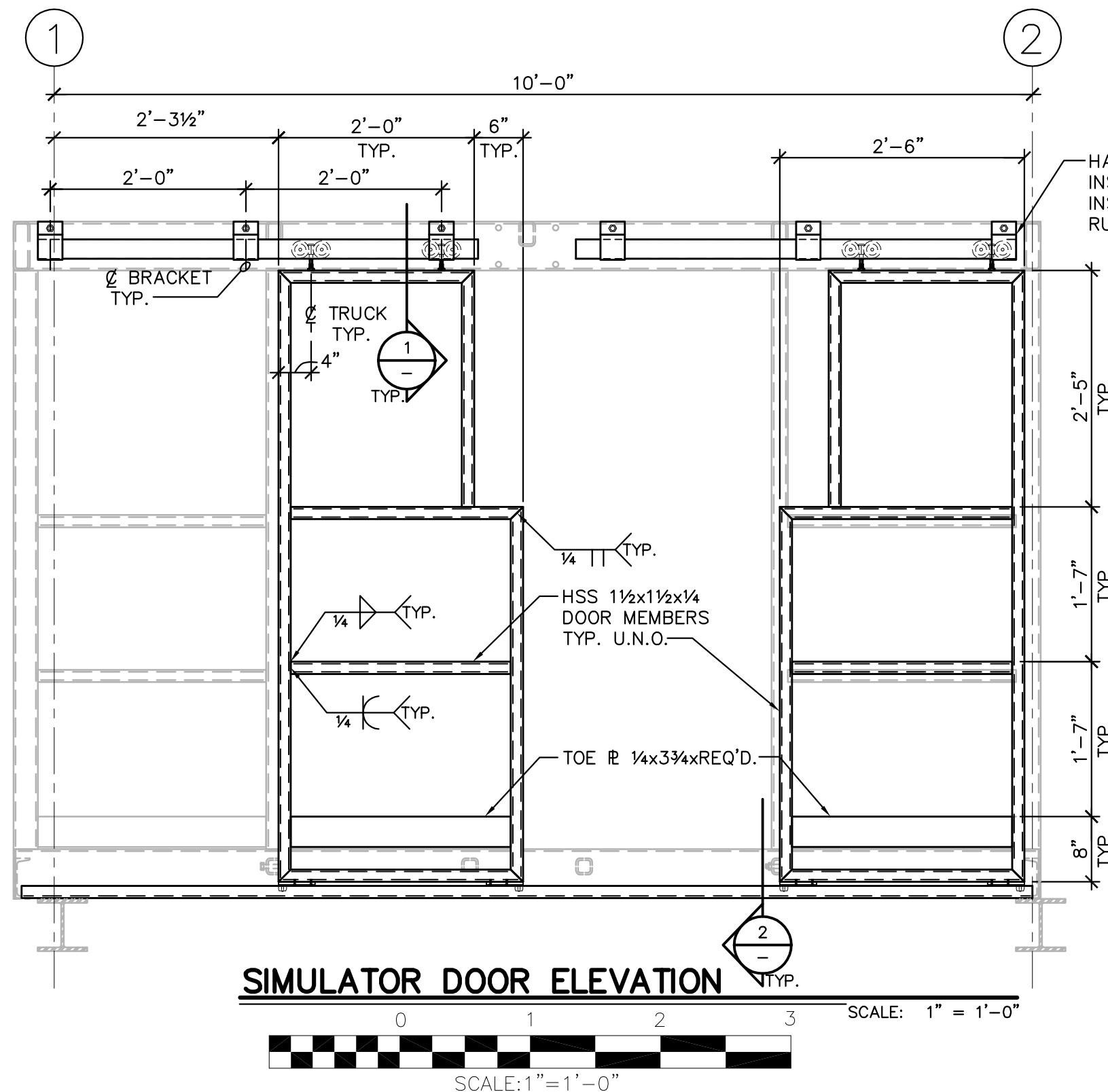
6 HOIST BEAM DETAIL
SCALE: 1 1/2"=1'-0"



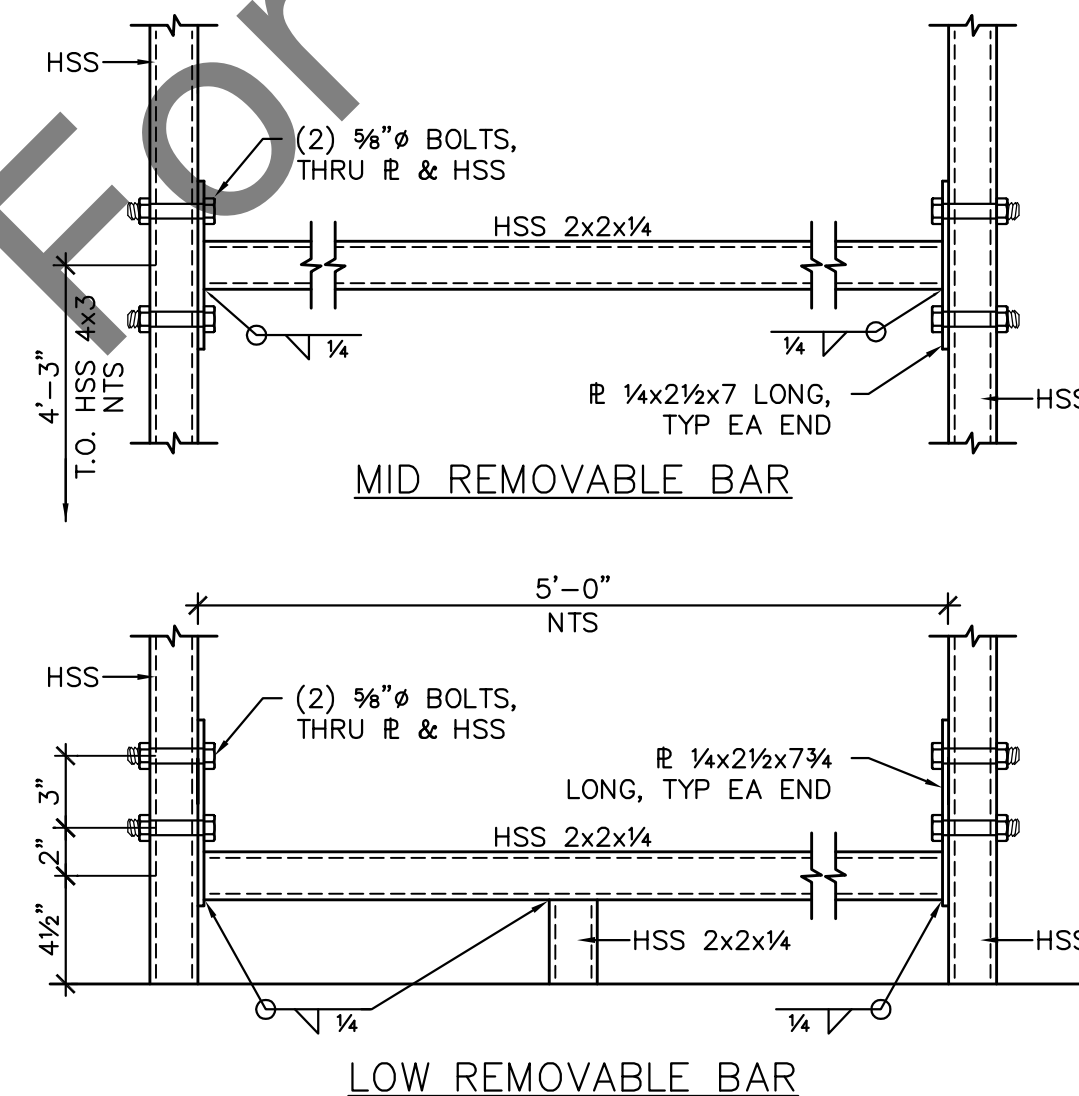
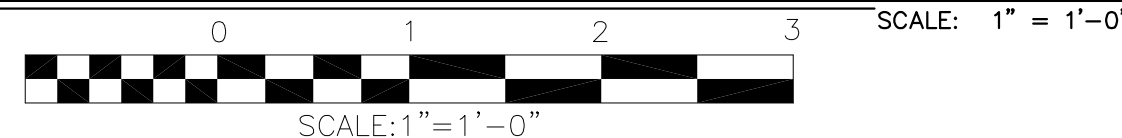
7 SHORT BEAM DETAIL
SCALE: 1 1/2"=1'-0"



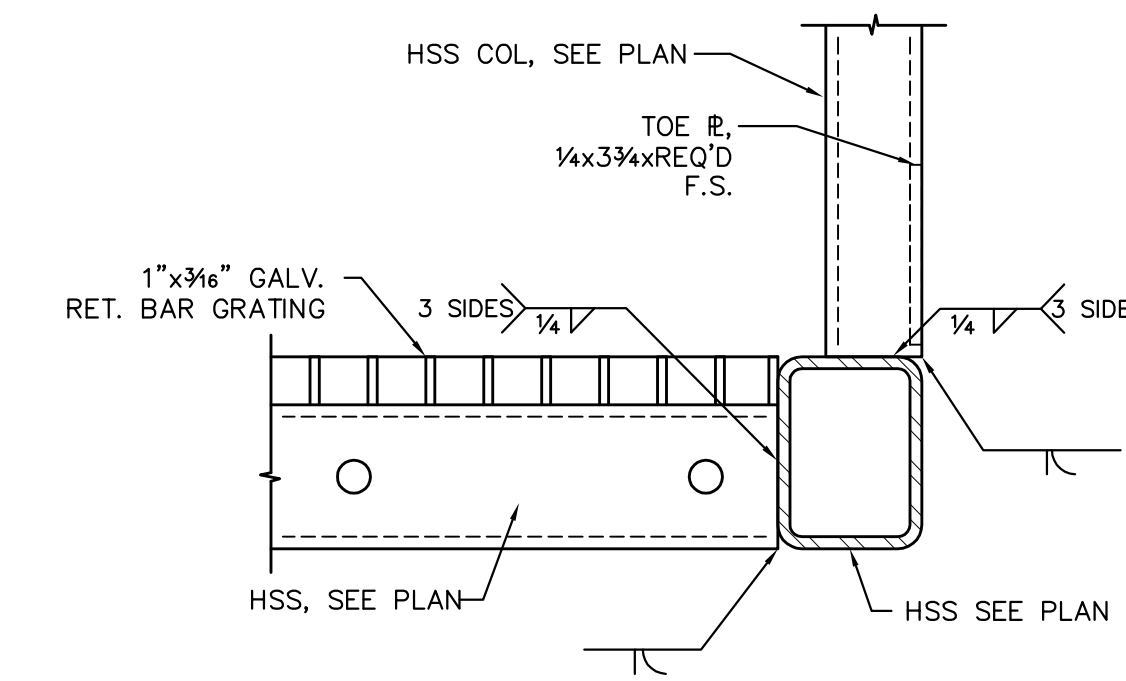
8 LONG BEAM DETAIL
SCALE: 1 1/2"=1'-0"



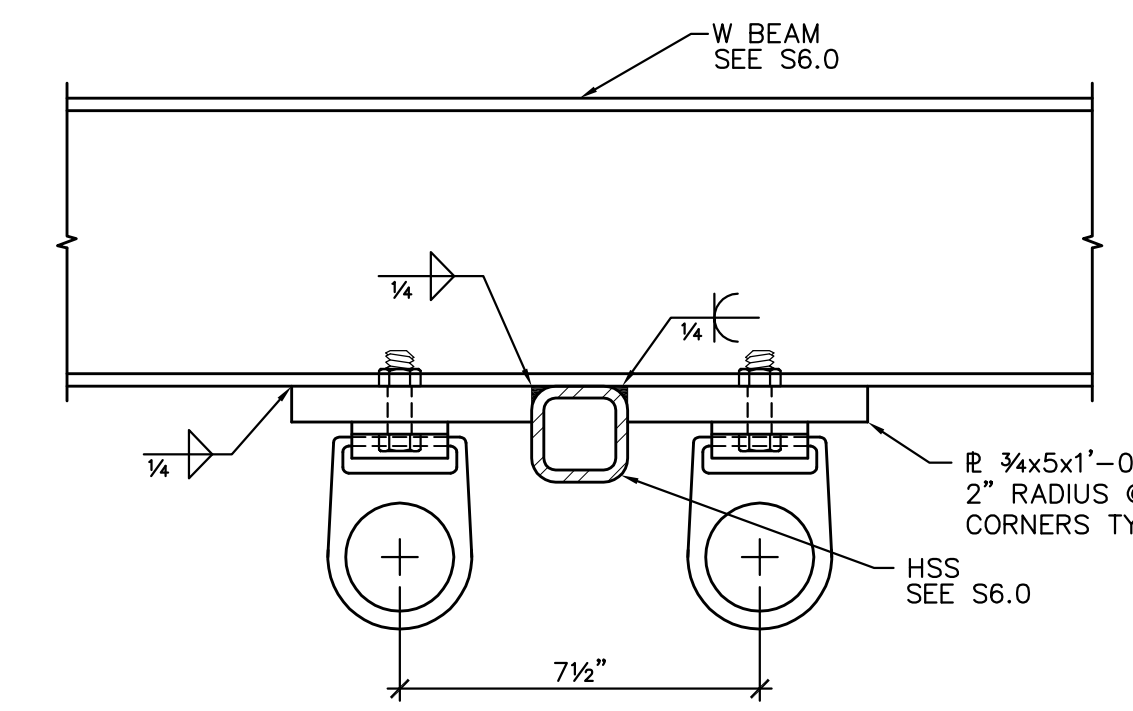
SIMULATOR DOOR ELEVATION



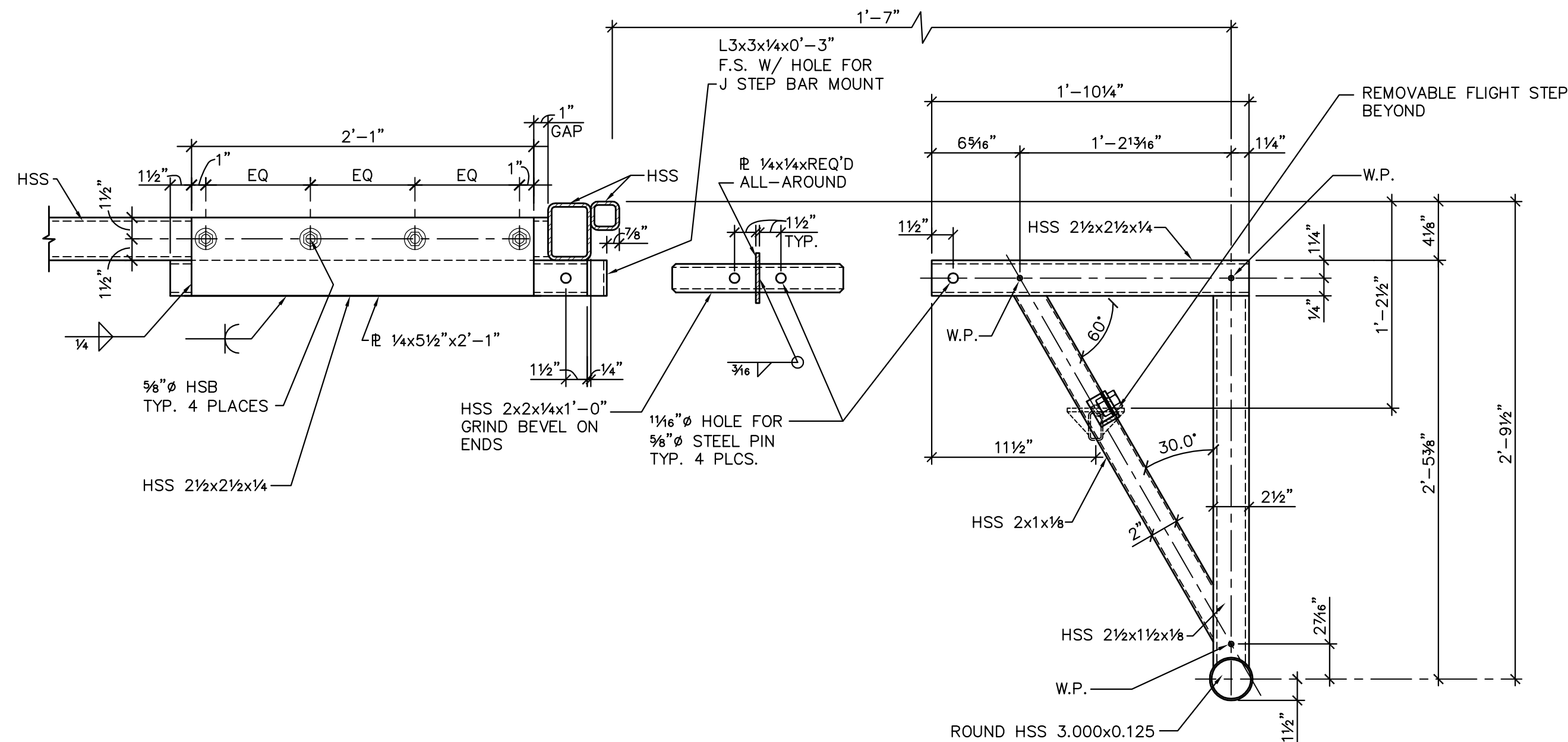
9 DOOR CONNECTION DETAILS
SCALE: 3"=1'-0"



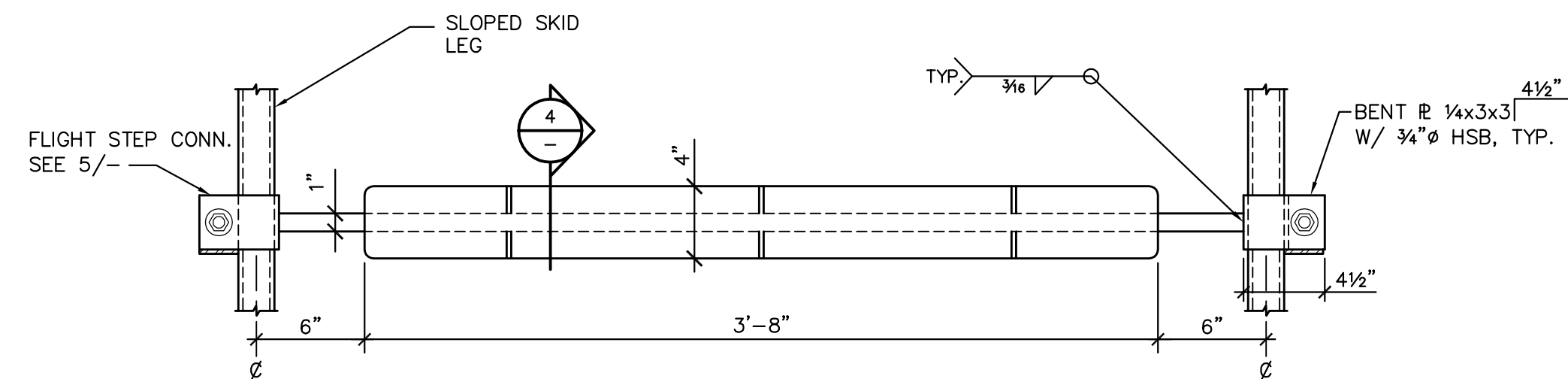
10 FLOOR GRATING DETAIL
SCALE: 1"=1'-0"



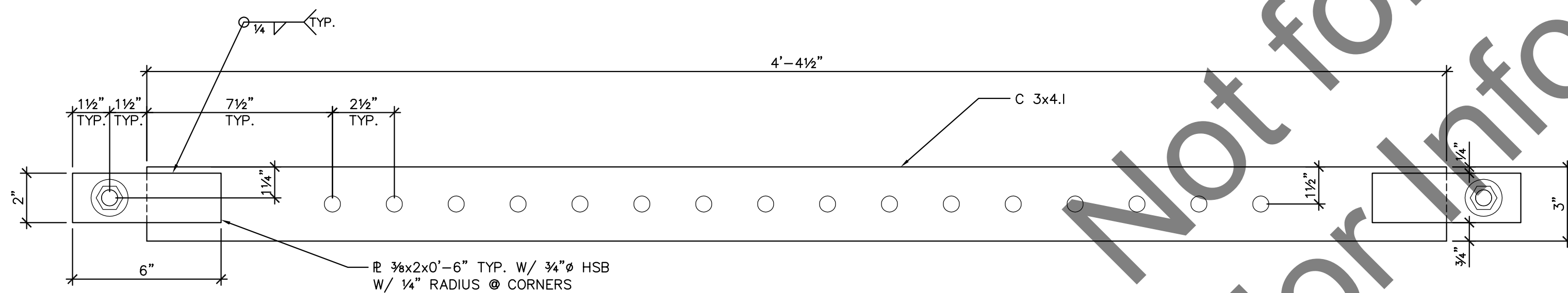
11 ROOF RAPPEL ATTACHMENT
SCALE: 3"=1'-0"



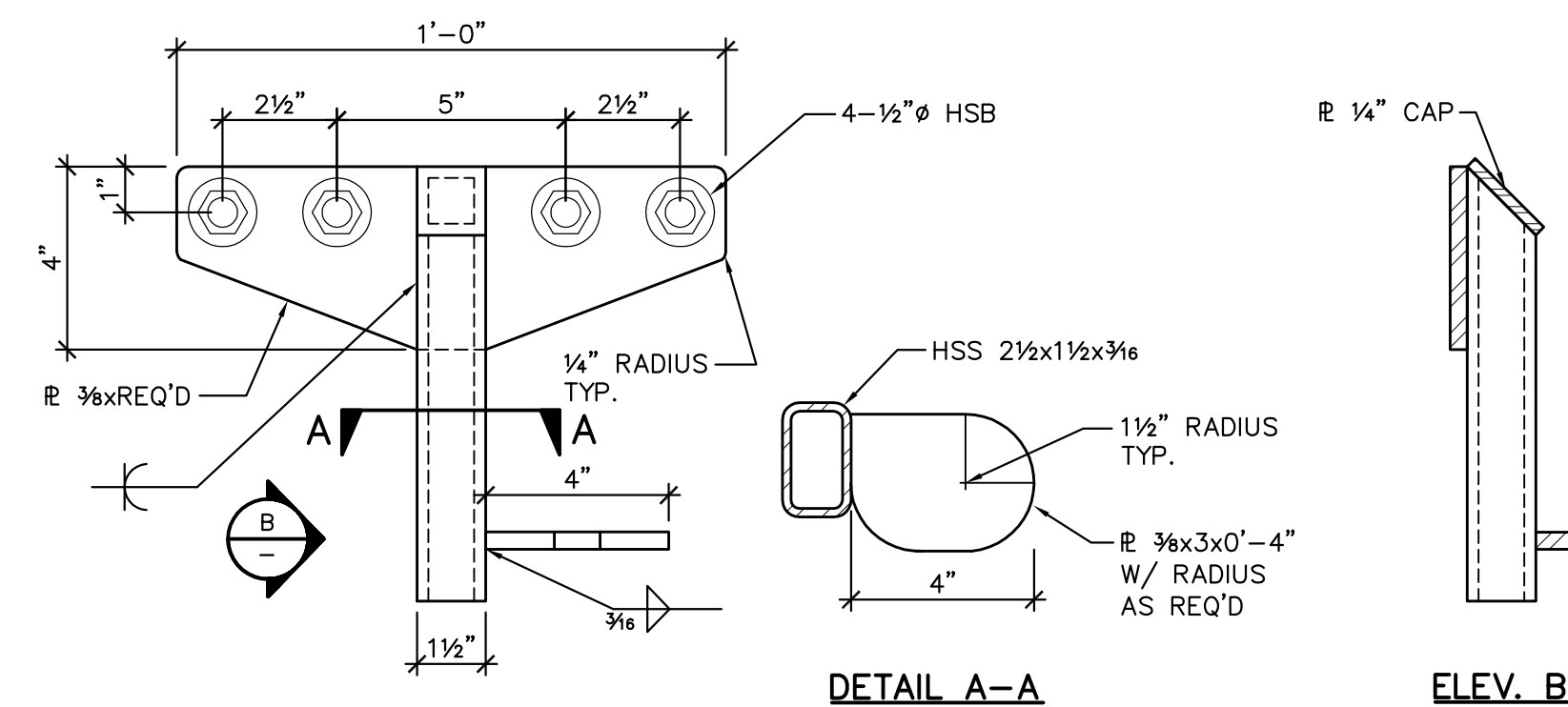
1 SKID SIDE VIEW
SCALE: 1 1/2"=1'-0"



3 FLIGHT STEP PLAN VIEW
SCALE: 1 1/2"=1'-0"

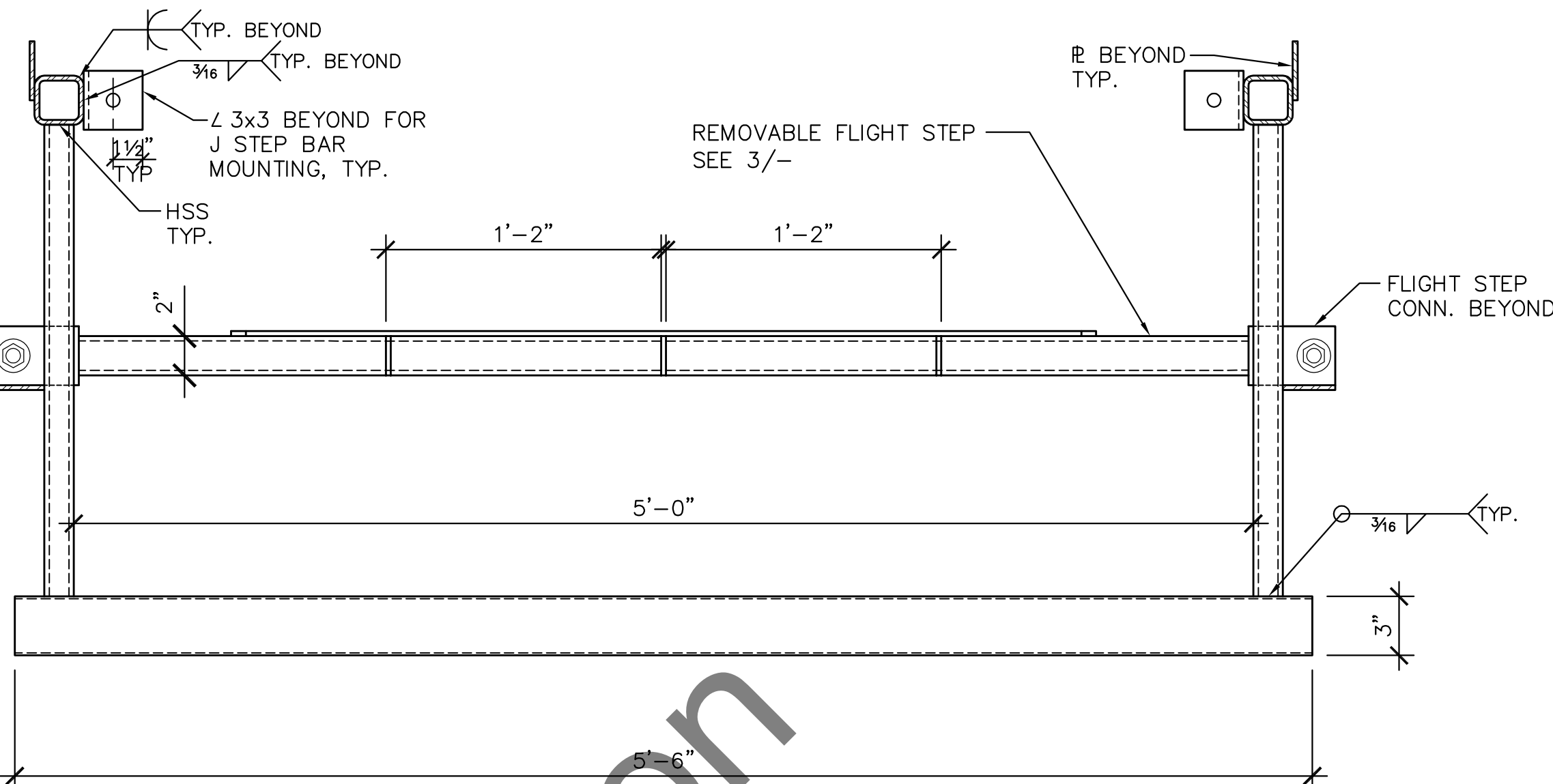


7 J STEP ELEVATION
SCALE: 3"=1'-0"

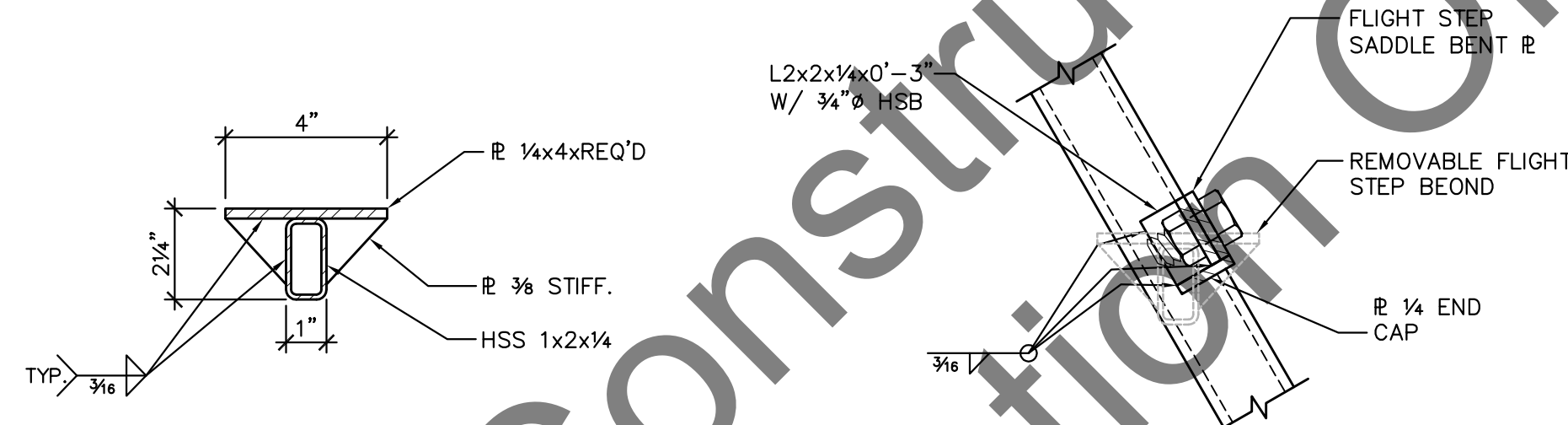


8 J STEP
SCALE: 3"=1'-0"

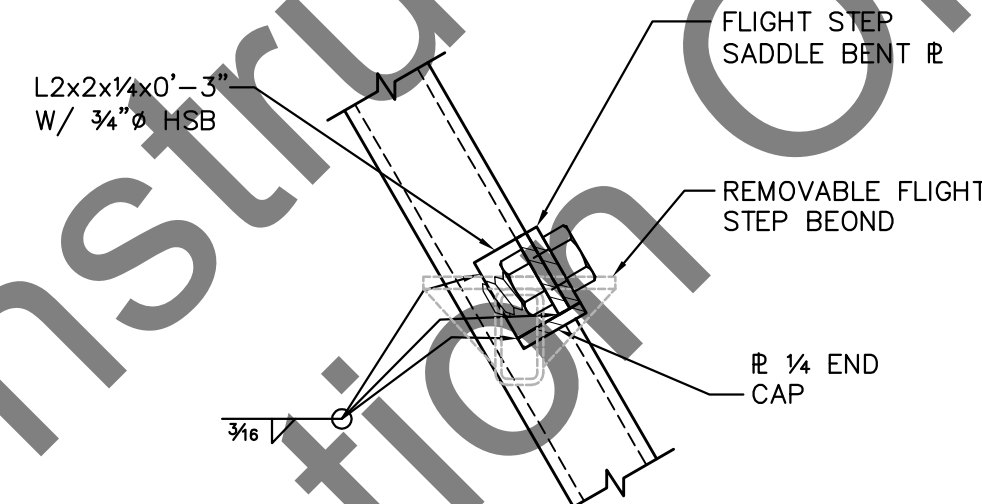
STRIVING FOR EXCELLENCE



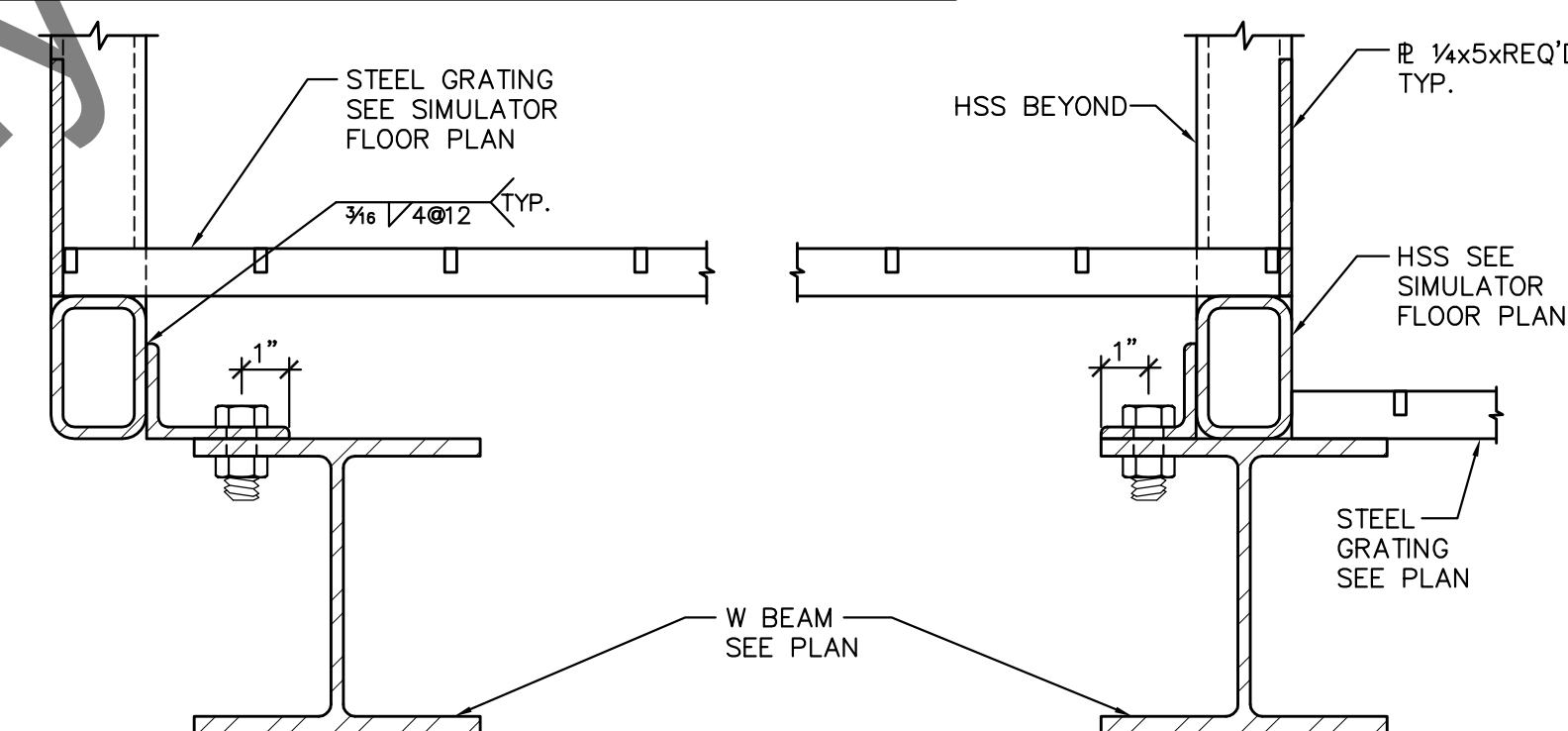
2 SKID FRONT VIEW
SCALE: 1 1/2"=1'-0"



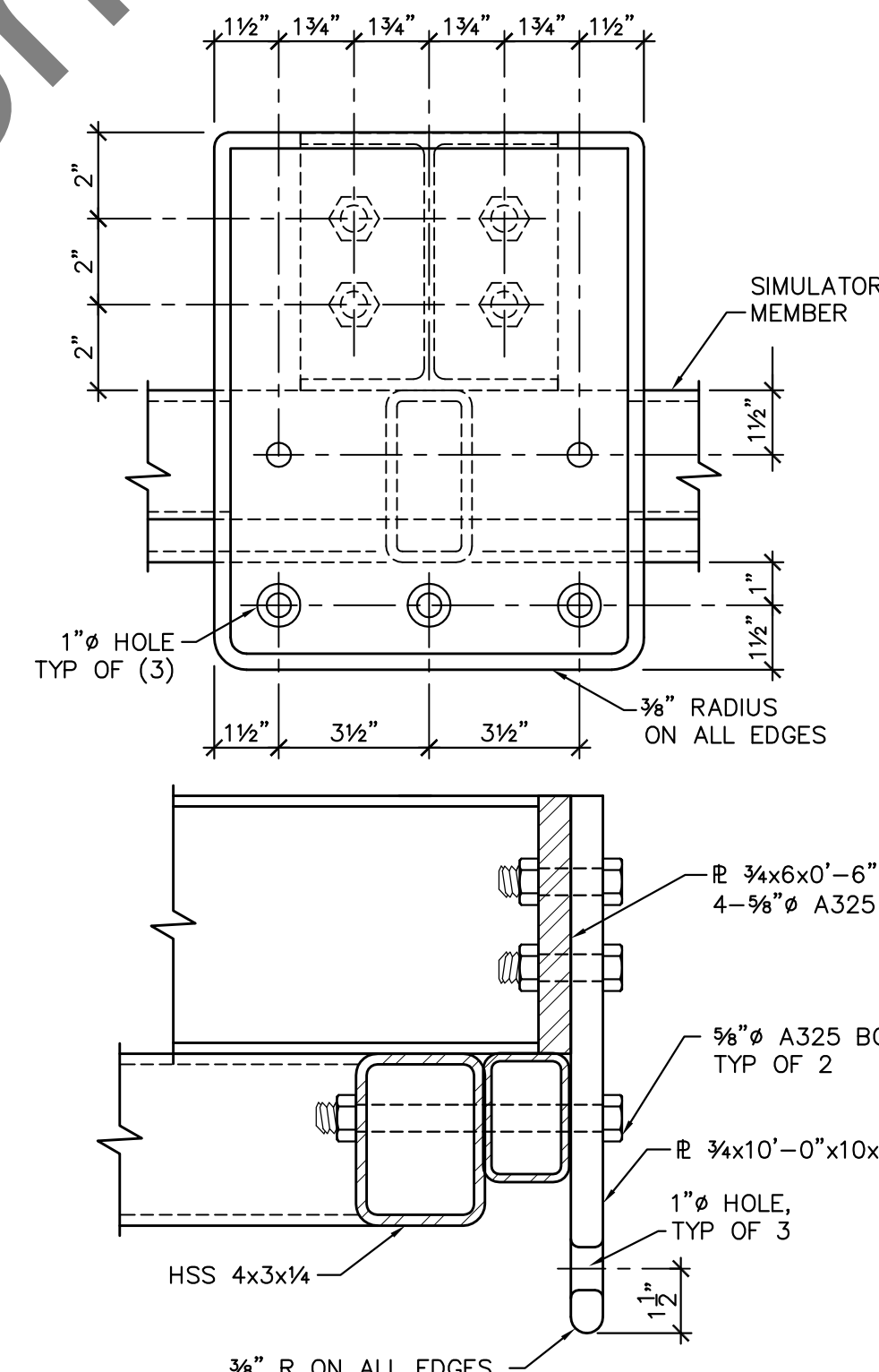
4 FLIGHT STEP SECTION
SCALE: 3"=1'-0"



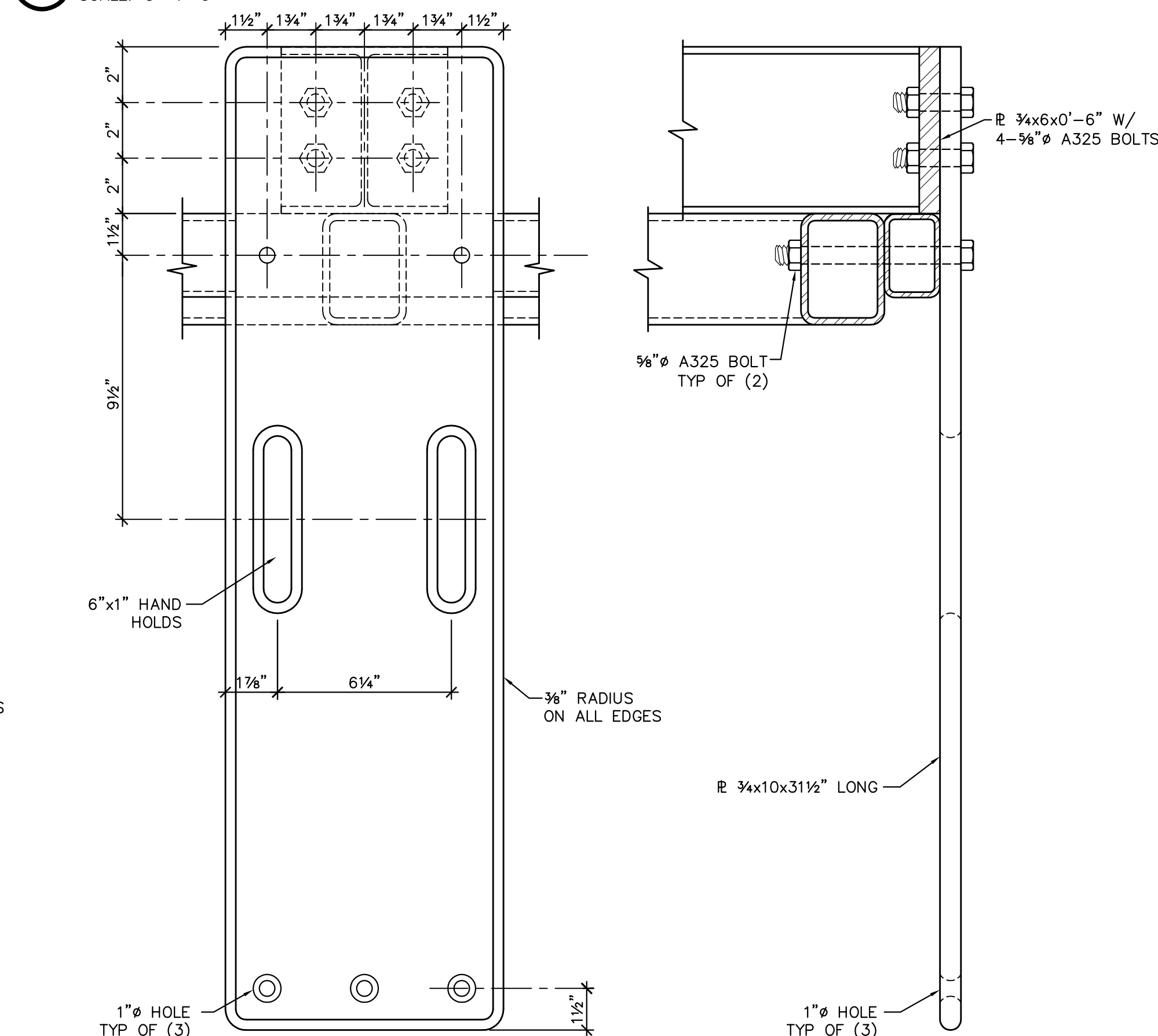
5 FLIGHT STEP CONN.
SCALE: 3"=1'-0"



6 SIMULATOR CONN.
SCALE: 3"=1'-0"



9 REMOVABLE SHORT R DETAIL
SCALE: 3"=1'-0"
(2 REQ'D)



10 REMOVABLE TALL PLATE DETAIL (2 REQ'D)
SCALE: 3"=1'-0"