

**ENGINEERED TIEDOWN SYSTEM  
C.P. SEISMIC PIER™<sup>△</sup>  
ETS-107**

**FOR:** CENTRAL PIERS, INC.  
284 N. THORNE AVE.  
FRESNO, CA 93706  
559-268-0828

**BY:** ROCK SOLID ENGINEERING, INC.  
1100 MAIN STREET, SUITE A  
WATSONVILLE, CA 95076  
831-724-5868



Signed: 10-9-2020

STATE APPROVAL	
<b>ENGINEERED TIEDOWN SYSTEM APPROVED</b>	
Approved does not authorize or approve any omission or deviation from requirements of applicable State laws and regulations.	
State of California Department of Housing and Community Development DIVISION OF CODES AND STANDARDS	
By <u><i>[Signature]</i></u> (Signature)	Date <u>10/16/20</u>
SPA NO <u>ETS 107</u>	
This Plan Approval Expires <u>10/24/22</u>	

REV.	DATE	BY	COMMENTS
△3	10/09/20	YW	UPDATE TO 2019 CBC/CRC
△2	10/09/18	YW	UPDATE TO 2016 CBC/CRC
△1	09/23/16	YW	MINOR TEXT EDITS
△0	03/19/14	YW	UPDATE TO 2013 CBC/CRC

## GENERAL NOTES:

REFERENCE: CALIFORNIA CODE OF REGULATIONS, TITLE 25 AND <sup>3</sup>2019 C.R.C./C.B.C. THESE PLANS MEET THE INTENT OF <sup>3</sup>2019 C.R.C 301.1.3.

- DESIGN LOADS SHALL BE CONSISTENT WITH LOCAL REQUIREMENTS WHERE INSTALLED. WIND LOADS LISTED IN TABLE, SHEET F5, ARE PER <sup>3</sup>2019 CBC. THIS DESIGN IS NOT INTENDED FOR USE IN FLOOD HAZARD AREAS UNLESS A SEPARATE PLAN ADDRESSING THE FLOOD HAZARD IS SUBMITTED FOR REVIEW.
- FOOTINGS ARE TO BE SUPPORTED BY EITHER FIRM, UNSATURATED, UNDISTURBED SOIL OR COMPACTED FILL, ASPHALT OR CONCRETE. FOOTINGS ARE DESIGNED FOR 1500 PSF BEARING CAPACITY AND SHALL BE COMPATIBLE WITH LOCAL SOIL CONDITIONS. ALL FOOTINGS SHALL BE FOUNDED IN ACCORDANCE WITH H.C.D. GUIDELINES AND TITLE 25.
- STRUCTURAL STEEL:
  - SHALL CONFORM TO ASTM A36  $F_y = 36$  KSI MINIMUM.
  - SHALL BE FABRICATED ACCORDING TO AISC SPECIFICATIONS.
  - SHALL BE WELDED ACCORDING TO AWS SPECIFICATIONS:
    - ELECTRODES: E70
    - PLATES: ASTM A36
    - BOLTS: STANDARD ASTM A307
    - THREADED ROD: COLD DRAWN LOW CARBON WELDABLE
  - ALL METAL COMPONENTS INCLUDING NAILS & SCREWS ETC. ARE TO BE PROTECTIVE COATED.
- THE C.P. SEISMIC PIER SHALL BE LISTED & LABELED BY BSK ASSOCIATES FOR THESE ULTIMATE LOADS:
  - 7" THRU 18 INCH PIERS: 3203 LBS. (STRONG DIR), 2273 (WEAK DIR)
  - 19 INCH X-LARGE PIER: 1553 LBS. (STRONG DIR.) 1462 (WEAK DIR)
  - 16,000 VERTICAL
- THIS TIEDOWN SYSTEM IS FOR PLACING MANUFACTURED HOMES CONSTRUCTED WITH LONGITUDINAL OR CROSS JOISTS.
- THIS TIEDOWN SYSTEM PLAN IS DESIGNED TO BE CONSTRUCTED ON A FAIRLY LEVEL SITE WITH NO EXISTING SOIL PROBLEMS. SEE TITLE 25 SECTION 1334.
- THE SIZE, TYPE & LOCATION OF STANDARD VERTICAL SUPPORT PIERS & FOOTINGS MUST BE INSTALLED PER MANUFACTURER'S INSTALLATION MANUAL THAT IS SHIPPED WITH HOME. WITHOUT MANUAL, SPACING OF STANDARD PIERS TO BE DETERMINED BY TITLE 25, SECTION 1335.5.

### FOUNDATION PAD NOTES:

- TWO FOUNDATION PADS ARE AVAILABLE FOR USE WITH THIS SYSTEM. THE CUSTOMER MAY CHOOSE THE FOUNDATION PAD FOR THEIR HOME. SEE DETAIL 1, F7.
- FOUNDATION PADS SHALL BE PLACED ON FIRM, LEVEL UNDISTURBED SOIL (SEE GEN. NOTE 2)
- THE FOUNDATION PADS SHALL BE ORIENTED AS SHOWN ON THE PLAN VIEW DRAWING, SHEETS F3 AND F4, WITH THE BOLT HOLES PERPENDICULAR TO THE CHASSIS BEAM.
- CONCRETE FOUNDATION PADS
  - 2500 PSI AT 28 DAYS, TESTED AND MANUF. BY STARLITE WEIGHT CONCRETE.
- PRESSURE TREATED FOUNDATION PAD
  - $\frac{3}{4}$  INCH A.P.A. 48/24 EXTERIOR P.S.I.-83 CC. PLUGGED,NER-QA397,PRP-108.

- ATTACHMENT TO EXISTING CONCRETE SLAB  
THE C.P. SEISMIC PIER MAY BE ATTACHED TO AN EXISTING COMPETENT CONCRETE SLAB OR CONCRETE FOOTING ACCORDING TO THE FOLLOWING CRITERIA:
  - ATTACH WITH TWO 5/8" DIAM. REDHEAD WEDGE ANCHORS, OR EQUIVALENT
  - MINIMUM EMBEDMENT = 2.5"
  - MINIMUM CONCRETE THICKNESS = 3 $\frac{3}{4}$ "
  - MINIMUM EDGE DISTANCE = 2"

### HOME SIZE NOTES:

- UNLESS APPROVED BY ROCK SOLID ENGINEERING, INC., THE ROOF PITCH SHOULD NOT EXCEED SHOWN IN TABLE, SHEET F5.
- FOR ANY HOME SIZE OTHER THAN AS SHOWN ON THIS PLAN OR REFERENCED ABOVE LAYOUT SHALL BE REVIEWED AND APPROVED BY ROCK SOLID ENGINEERING, INC.

### INSPECTION REQUIREMENTS:

- THE DESIGN OF THIS SYSTEM IS BASED ON STANDARD MANUFACTURED HOMES AS BUILT BY THE MANUFACTURER. SITE BUILT ADDITIONS SUCH AS GARAGES AND SECONDARY ROOFS HAVE NOT BEEN INCLUDED IN THIS DESIGN.
- ALL DIMENSIONS INCLUDED ON THIS PLAN, INCLUDING HOME SIZE, ROOF HEIGHT AN PIER HEIGHT, SHOULD BE FIELD VERIFIED BY THE LOCAL BUILDING OFFICIAL. ANY DISCREPANCIES SHOULD BE IMMEDIATELY BROUGHT TO THE ENGINEER'S ATTENTION.
- THE BUILDING PAD SHOULD BE INSPECTED TO ENSURE THAT PROPER LOT PREPARATION AND DRAINAGE PATTERNS HAVE BEEN ESTABLISHED IN ACCORDANCE WITH TITLE 25 & MANUFACTURER.

### INSTALLATION INSTRUCTIONS:

- MARK CHASSIS BEAM ACCORDING TO REQUIRED SPACING.
- FOUNDATION FOR CHASSIS BEAM SUPPORTS SHALL BE LOCATED AND SIZED FOR THE LOADS AS SHOWN IN THE MANUFACTURED HOME INSTALLATION INSTRUCTIONS.
- ALL MANUFACTURER REQUIRED PIERS, EXCEPT MASONRY BLOCKS, MUST BE ATTACHED TO THE CHASSIS BEAM AND FOOTING PAD PER TITLE 25, SECTION 1334.1.
- LEVEL THE SOIL & PLACE THE FOUNDATION PAD BELOW MARKING AS PER LAYOUT, SHEETS F3 AND F4.
- ASSEMBLE C.P. SEISMIC PIER TO ITS LOWEST SETTING: PLACE IT ON THE FOUNDATION PAD AND ATTACH IT PER THE CORRESPONDING DETAIL 1, SHEET F7.
- RAISE TOP SECTION OF C.P. SEISMIC PIER UNTIL IT TOUCHES BOTTOM OF CHASSIS BEAM BY TURNING PIPE (FOUR TURNS EQUALS ONE INCH CHANGE IN HEIGHT) TIGHTEN 4 CLAMP BOLTS.
- CLAMP UPPER PLATE TO BOTTOM OF CHASSIS BEAM AS PER DETAILS 1 AND 2 SHEET F6.

HCD

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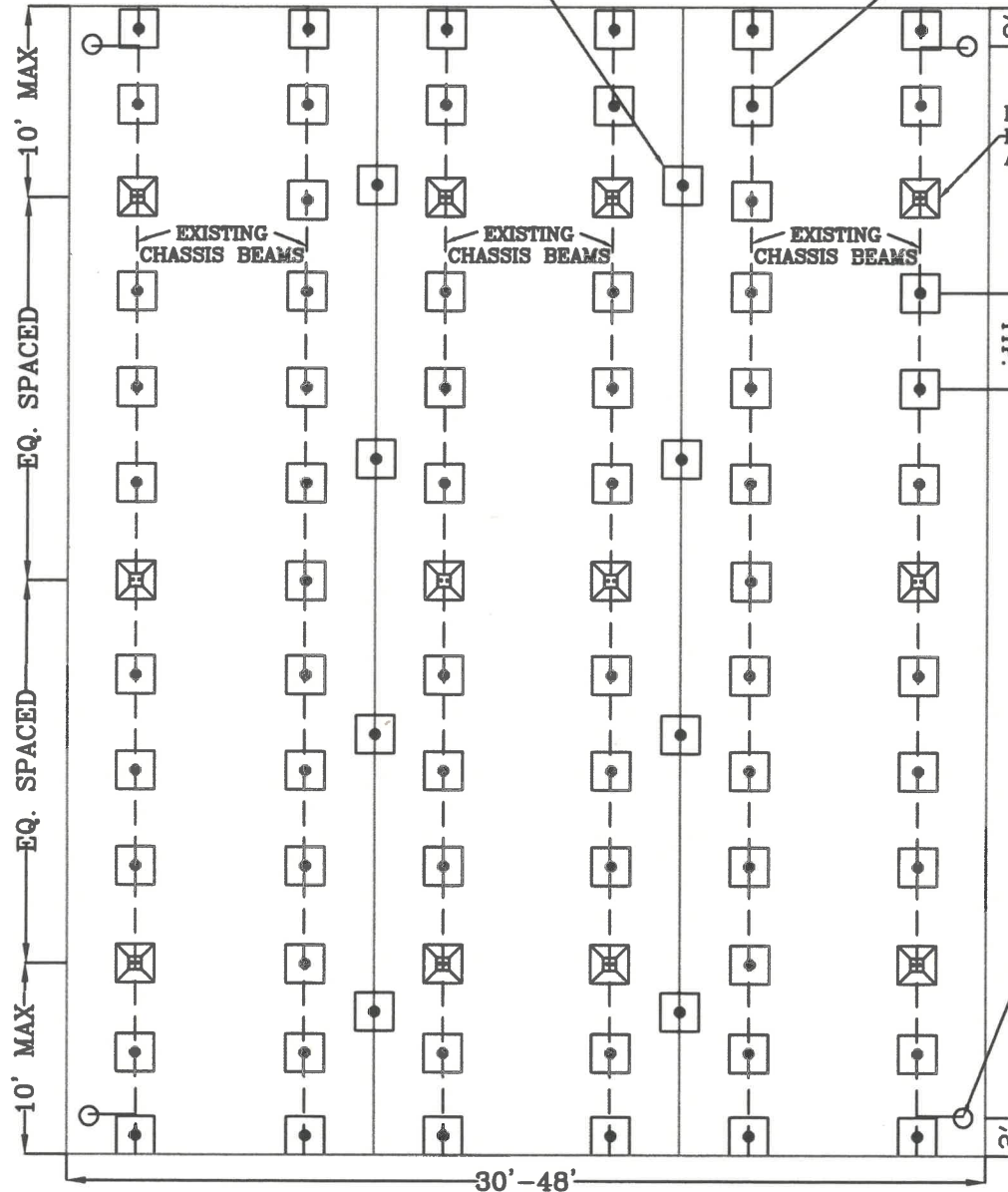
**ROCK SOLID ENGINEERING, INC.**

ENGINEERED TIEDOWN SYSTEM  
CENTRAL PIERS - ETS-107

10/09/20  
SHEET F2  
OF 7

SIZE, TYPE AND LOCATION OF MARRIAGE LINE  
SUPPORT PIERS MUST BE INSTALLED AS  
SPECIFIED IN THE HOME INSTALLATION MANUAL.

STANDARD PIER: SIZE, TYPE AND  
LOCATION MUST BE INSTALLED AS  
SPECIFIED IN HOME INSTALLATION  
MANUAL. 8' MAX O.C.



PLACE SEISMIC PIERS  
IN ROWS OF 4  
AS SHOWN

EXISTING  
CHASSIS BEAMS

EXISTING  
CHASSIS BEAMS

EXISTING  
CHASSIS BEAMS

8' MAX  
TYP.



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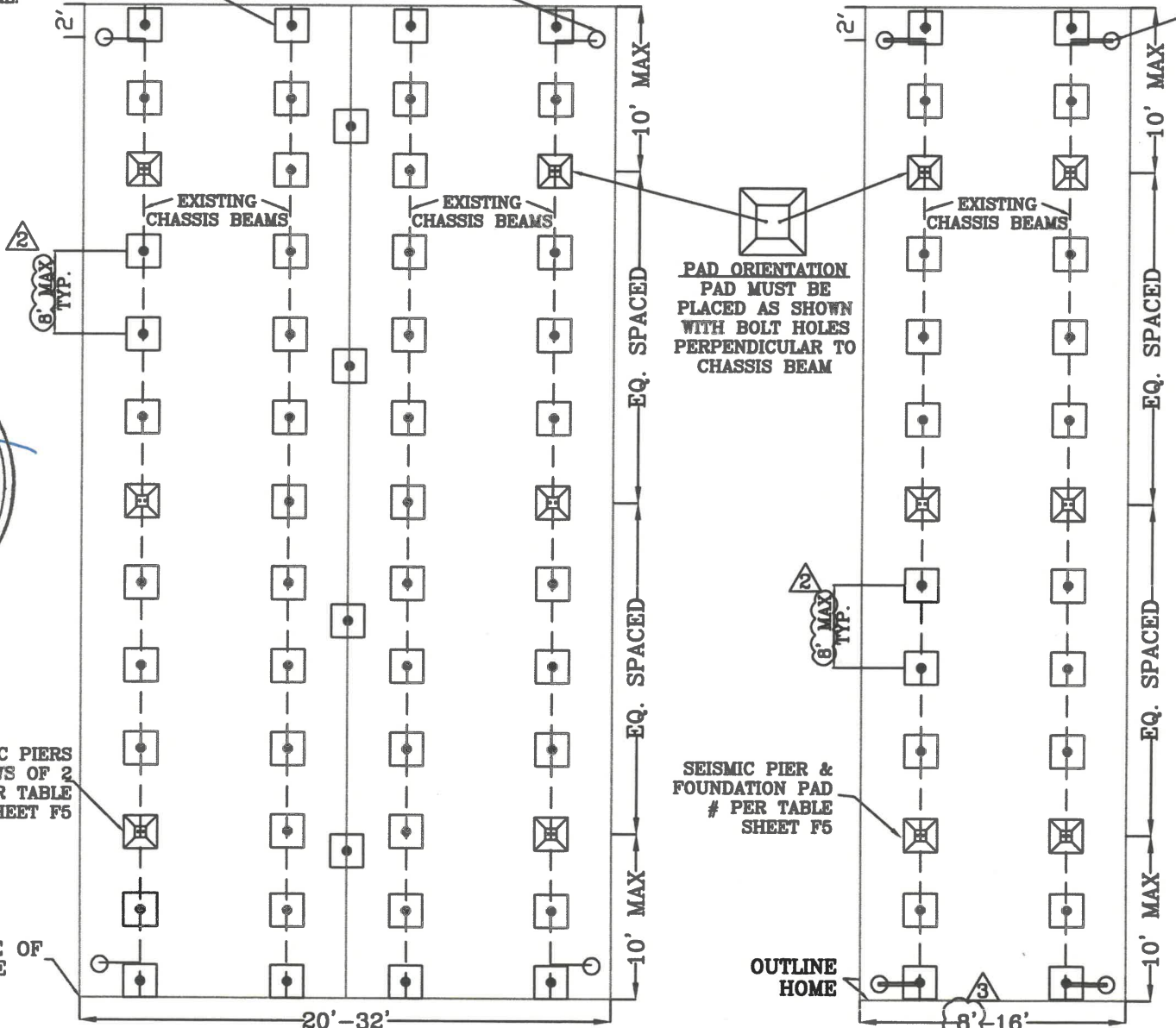
INSTALL HOME PRIDE OR OLIVER  
TECHNOLOGIES EARTH ANCHORS,  
OR EQUIVALENT - 2900 lbs CAPACITY.  
NUMBER PER TABLE, SHEET F5.  
SPACE 1ST ROW 2 FT FROM END  
THEN SPACE EVENLY.

HCD  
Exp 10/24/22

PLAN Scale: 1" = 10'  
TRIPLE WIDE HOMES

STANDARD PIER: SIZE, TYPE AND LOCATION MUST BE INSTALLED AS SPECIFIED IN HOME INSTALLATION MANUAL.

INSTALL HOME PRIDE OR OLIVER TECHNOLOGIES EARTH ANCHORS, OR EQUIVALENT - 2900 lbs CAPACITY. NUMBER PER TABLE SHEET F5. SPACE 1ST ROW 2 FT FROM END THEN SPACE EVENLY.



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PLAN Scale: 1" = 10'  
DOUBLE WIDE HOMES

PLAN Scale: 1" = 10'  
SINGLE WIDE HOMES

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3

		MAX. WIND LOAD(MPH,EXP)		15 psf or 100B			100C			120B			120C		
	MAX ROOF PITCH	HOME SIZE		# OF SEISMIC PIERS	# OF ROWS	# OF TIE DOWNS	# OF SEISMIC PIERS	# OF ROWS	# OF TIE DOWNS	# OF SEISMIC PIERS	# OF ROWS	# OF TIE DOWNS	# OF SEISMIC PIERS	# OF ROWS	# OF TIE DOWNS
		WIDTH	LENGTH												
SINGLES	4:12	8'-16'	30' TO 48'	4	2 ROWS	4	4	2 ROWS	4	4	2 ROWS	4	4	2 ROWS	6
			48.5'-60'	4	2 ROWS	4	6	3 ROWS	4	6	3 ROWS	4	6	3 ROWS	6
			60.5'-78'	6	3 ROWS	4	6	3 ROWS	4	6	3 ROWS	6	6	3 ROWS	6
DOUBLE WIDES	4:12	20'-23.5'	36'-56'	4	2 ROWS	0	4	2 ROWS	0	4	2 ROWS	4	4	2 ROWS	4
			56.5'-66'	6	3 ROWS	0	6	3 ROWS	0	6	3 ROWS	4	6	3 ROWS	4
			66.5'-78'	8	4 ROWS	0	8	4 ROWS	0	8	4 ROWS	4	8	4 ROWS	6
		24'-32'	43'-56'	4	2 ROWS	0	6	3 ROWS	0	4	2 ROWS	4	6	3 ROWS	4
			56.5'-66'	6	3 ROWS	0	6	3 ROWS	0	6	3 ROWS	4	6	3 ROWS	4
			66.5'-78'	8	4 ROWS	0	8	4 ROWS	0	8	4 ROWS	4	8	4 ROWS	6
TRIPLES	4:12	30'-36'	46'-60'	8	2 ROWS	0	8	2 ROWS	0	8	2 ROWS	4	8	2 ROWS	4
			60.5'-78'	12	3 ROWS	0	12	3 ROWS	0	12	3 ROWS	4	12	3 ROWS	6
		36.5'-48'	54'-60'	8	2 ROWS	0	8	2 ROWS	0	8	2 ROWS	4	12	3 ROWS	4
			60.5'-78'	12	3 ROWS	0	12	3 ROWS	0	12	3 ROWS	4	12	3 ROWS	6

FIND HOME SIZE. FOLLOW ROW ACROSS TO DESIGN WIND LOAD. READ TOTAL NUMBER OF C.P. SEISMIC PIERS & TOTAL NUMBER OF TIEDOWNS REQUIRED. NOTE MAX ROOF PITCH. SEE PLAN SHEETS F3 AND F4 FOR PLACEMENT OF PIERS & TIEDOWNS. AUGER TIEDOWNS SHALL BE LISTED BY HCD & INSTALLATION INSTRUCTIONS SHALL BE ON SITE AT TIME OF INSPECTION. IF EXACT HOME SIZE IS NOT LISTED, CHECK NEXT SMALLER & LARGER SIZE AND USE THE ONE THAT REQUIRES MORE PIERS & TIEDOWNS. IF HOME IS SHORTER THAN THE LENGTH LISTED, PLEASE CONTACT US FOR A DESIGN. 2

3 TABLE UPDATED BASED ON 2019 CODES.

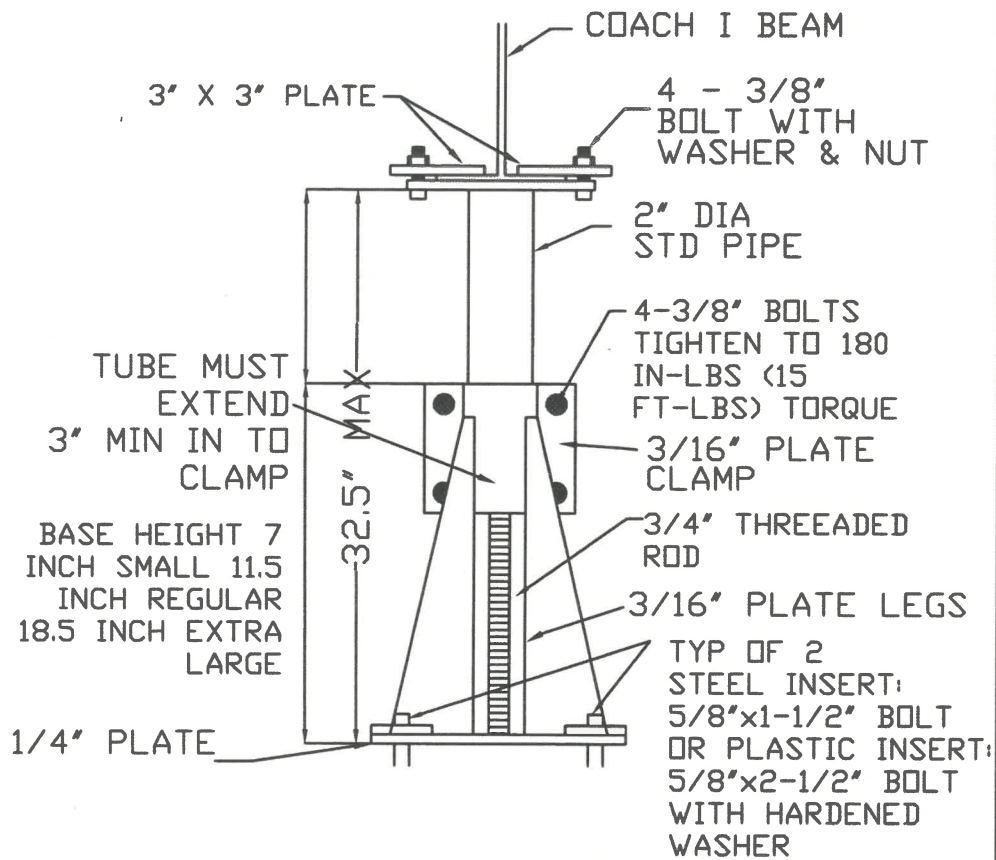


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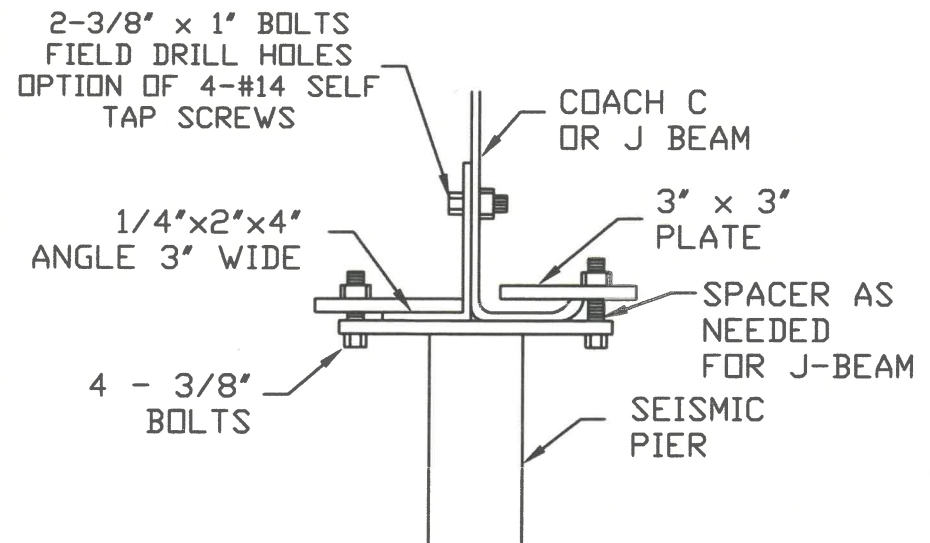
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CENTRAL PIERS - ETS-107

3 10/09/20  
SHEET F5  
OF 7



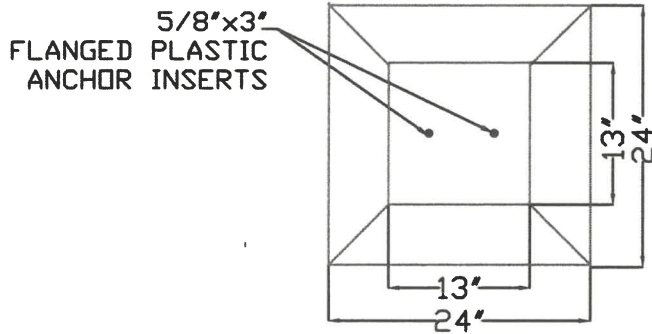
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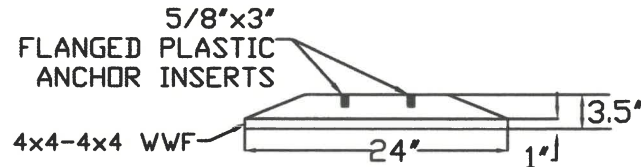
HCD  
EXP 10/24/22

1 SEISMIC PIER™ <sup>⚠</sup> NOT TO SCALE  
C.P. SEISMIC PIER #1  
LISTING #C03-044-80F BY BSK

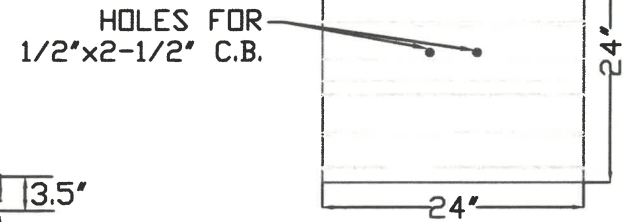
2 TYPICAL BEAM CONNECTION  
NOT TO SCALE



C.P. PRO PAD

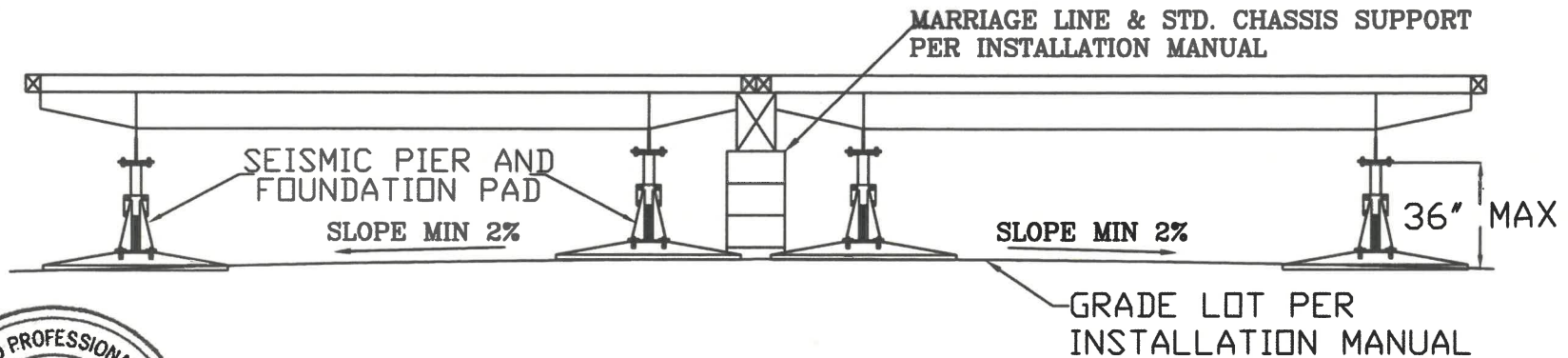


C.P. PRO PAD



PLYWOOD PAD

1 FOUNDATION PADS  
NOT TO SCALE



2 ELEVATION  
NOT TO SCALE

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