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467 Swan Ave • Hohenwald, TN 38462 • (800) 284-7437 • www.olivertechnologies.com • Fax (931) 796-8811

Oliver Technologies 1100 "V" Series All Steel Foundation System Installation Instructions for California for CA-3 All Steel Foundation System Model 1100 ICV & 1100 IV M.H. Permanent Foundation System

INTRODUCTION

The All Steel Foundation 1100 "V" series is designed for both dirt and concrete foundation applications. Where noted the 'ICV' indicates wet or dry concrete set, and the "IV" indicates the ground pan dirt set. These drawings show foundations details which are applicable to HUD code houses and California HCD code manufactured homes. The foundation plan shown is general and is to be adjusted to meet the specific house being installed. These design drawings are supplemental to the home installation manual. Refer to the installation manual for mating line and main rail pier locations and for specific support and anchoring requirements for special architectural features. Pier spacings shall be based on soil conditions and roof loads for the site where the house is installed. This system meets the requirements of California Code of Regulations, Title 25, Chapter 2, Article 7, Section 1333. This system also complies with the wind and seismic requirements of the California Building Code 2007 and the International Building Code 2006.

GENERAL NOTES:

1. All work shall conform to the requirements of this design and of the building code adopted by the agency having jurisdiction.
2. The "V" brace of the All Steel Foundation System has an approved design load as a pier of 4000 lbs. Support piers other than the "V" brace shall be in accordance with the home manufacturer's installation instructions and shall be approved designs of CMU or steel support stands.
3. Design Criteria:

Wind Pressures -	90 MPH Exposure C & 110 Mph Exposure C
Roof Live Load -	40 psf Max per House Design / 100 psf Max per House Design
Seismic -	Design Category D
Roof Pitch -	6:12 Max
Eave Width -	16" Max
Sidewall Height -	102" Max

4. Determine the appropriate design wind pressure for this site (90 Mph or 110 Mph). Enter the appropriate section of Table 1 or Table 2 (*see page 3*) to determine the number of all steel foundation brace systems and/or tiedowns required.

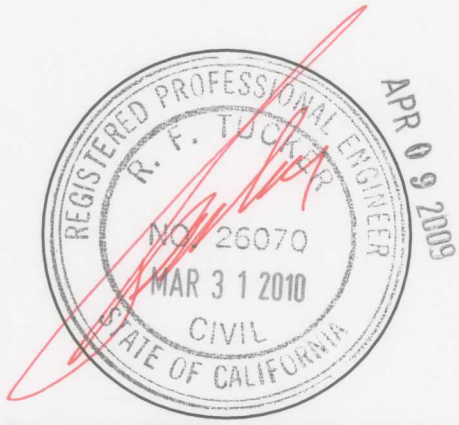
SPECIAL CIRCUMSTANCE:

For eave width between 16" to 24": use additional transverse system (noted by T, see drawing page 3)

If the Following Conditions Occur:

STOP! Contact Oliver Technologies at 1-800-284-7437 for further instruction:

A. Pier height exceeds 48" (From top of footer to bottom of I-Beam).
B. Roof eaves exceed 24".
C. Sidewall height exceed 102".
D. Roof Pitch greater than 6/12.
E. Location is within 1500 feet of coastline.
F. Footing to surface area exceeds 3 square feet.
G. Main rail spacing exceeds 102".



ENGINEER APPROVAL

MANUFACTURED HOME/MOBILE HOME
FOUNDATION SYSTEM
HEALTH AND SAFETY CODE, SECTION 18551
APPROVED

SUBJECT TO CORRECTIONS NOTED

APPROVAL DOES NOT AUTHORIZE OR APPROVE ANY OMISSIONS 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 Dardwell (signature) DATE 4/24/09

SPA NO. 117-IF

This Plan Approval Expires 2/10/2011

STATE APPROVAL

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INSTALLATION USING CONCRETE RUNNER/FOOTER ("ICV")

The concrete footer, runner or slab may be any shape, that has a minimum of 2900 cu. in., with a minimum depth of 3 1/2" (dry set) or 6" (wet set), at each system location. The surface of the footing must be large enough to support the pier load and allow at least 4" from the concrete bolt to the edge of the concrete (example: 22" X 22" X 6"). The concrete shall be minimum 2500 psi mix (pre-blended sacked concrete mix is acceptable). Special inspection of footing is not required.

***Special Design - When FOUR ICV's are installed on concrete runners or a full slab, no anchors are needed on single section homes except where required by manufacturer.**

If the 1100 ITC transverse system, (D(W or D) bracket only) is to be installed without using the 1100 ILC longitudinal system (J(W or D) bracket), it MUST be installed within 18" of a pier.

LONGITUDINAL ("V"): When using the 1100 wet set J(W) bracket, simply install the bracket in runner/footer OR when installing in cured concrete, use the 1100 dry set J(D) bracket. The 1100 dry set J(D) bracket is attached to the concrete using (2) 1/2" X 3" concrete wedge bolts. Place the bracket in desired location. Mark bolt hole locations, then using a 1/2" diam. masonry bit, drill a hole to a minimum depth of 3". Make sure all dust and concrete is blown out of the holes. Place wedge bolts into drilled holes, then place 1100 J(D) bracket onto wedge bolts and start wedge bolt nuts. Take a hammer and lightly drive the wedge bolts down by hitting the nut (making sure not to hit the top of threads on bolt). The sleeve of concrete wedge bolt needs to be at or below the top of concrete. Complete by tightening the nuts.

LATERAL (Transverse Arm): For wet set installation set the transverse connector bracket D(W) into runner/footer at desired location. For dry set installations, the transverse connector bracket D(D) is attached to the concrete using (2) 1/2" X 3" concrete wedge bolts. Mark bolt hole locations, then using a 1/2" diam. masonry bit, drill a hole to a minimum depth of 3". Make sure all dust and concrete is blown out of the holes. Place wedge bolts into drilled holes. Attach transverse connector bracket D(D). If needed, take a hammer and lightly drive the wedge bolts down by hitting the nut (making sure not to hit the top of threads on bolt.) Complete by tightening the nuts.

SPECIAL NOTE: The longitudinal "V" brace system serves as a pier under the home and should be loaded as any other pier would be. To do this, it is recommended that after leveling all piers, add 1/4" to 1/2" of height to the home at system location, set up the longitudinal "V" brace system completely and then lower the home onto the piers.To begin setup, complete items 1 through 5 below.

INSTALLATION OF GROUND PAN FOR DIRT SET("IV")

1. Remove weeds and debris in an approximate three foot square to expose firm, level undisturbed soil or controlled fill for each ground pan (B).
2. Place ground pan (B) centered directly below chassis I-beam. Press or drive pan firmly into soil until flush with or below soil surface.

INSTALLATION OF LONGITUDINAL "V" BRACE SYSTEM

1. Select the correct square tube brace (E) length for set-up (pier) height at support location.

PIER HEIGHT = the dimension from the top of the pan to the bottom of the I-Beam

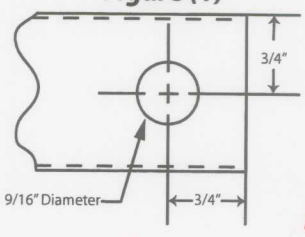
PIER HEIGHT (Approx. 40-60 degrees Max.)	1.5" Tube Length
14" to 18"	20"
18" to 25"	28"
24" to 35"	39"
30" to 40"	44"
36" to 48"	54"

NOTE:

a) Installation of the longitudinal system eliminates the need for the longitudinal anchors.
b) Installation of the transverse system eliminates the need for most of the diagonal frame ties and stabilization plates. (*see note e*)
c) All other home manufacturer's installation instructions of stabilizing devices must be followed, including installation of sidewall tie down anchors, shear wall or centerline tie down anchors.
d) If the home manufacturer's installation instructions are not available, the home must be installed in accordance with any state promulgated rules, or as required by the authority having jurisdiction.
e) Installation of this system on single wide homes requires the installation of 4 ground anchors (rated min. 3150 lbs.) 1 at each corner not more than 10 ft. from the end of the home.

2. Place both 1.5" square tubes (E) into the "V" bracket (J). Insert 1 - 3", Grade 5 carriage bolt and leave nut loose for final adjustment.
3. Place I-beam connector (F) loosely on the bottom flange of the I-beam.
4. Attach the selected 1.5" tubes (E) to the I-beam connectors (F) and fasten loosely with 2 - 3", grade 5 bolts and nuts. *NOTE: The footer must be level in both directions to ensure the angle markings on the centerpoint connector are correct from the horizontal plane of the footer. The angle is not to exceed 60 degrees and not less than 40 degrees. The "V" bracket (J) is stamped with the angles to verify correct degree. Use proper length tube or cut and drill tube to achieve proper length. (The tube may be cut using any appropriate steel cutting method such as steel saw, cutting torch, etc. New holes must be drilled to the dimension and at the location as shown for* ***Figure (1)****.*
5. Using standard hand tools, tighten all nuts and bolts. When connecting the brace tube to the I-beam connector (F), tighten at least one and a half to two turns past hand tight.

Figure (1)



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INSTALLATION OF (LATERAL) TRANSVERSE TELESCOPING ARM SYSTEM (1100 ITV)

6. Select the correct telescoping transverse sections for set up of lateral (transverse) arm at support location. The 60" sections are standard. The 72" sections are used on frame widths greater than 99.5" (Be sure to install the 1.5" tube at the the top side of the transverse section.)
7. Install the 1.5" transverse arm (H) to the transverse connector bracket(D) with a 2.5", grade 5 bolt and nut.
8. Slide the 1.25" transverse arm (H2) into the 1.5" transverse arm (H). Attach the 1.25" transverse arm (H2) to the I-beam connector (I) with a 2.5", grade 5 bolt and nut. Connect the I-beam connector (I) to the I-beam using the flat clamp, a 1", Grade 2 bolt and nut.
9. Secure the 1.5" transverse arm (H) to the 1.25" transverse arm (H2) using the four (4) 1/4" - #14 x 3/4" self-tapping screws the in pre-drilled pilot holes.
10. **System Placement - SEE DRAWINGS:**
    - A) Place two (2) systems at second pier from the end at the opposite sides.
    - B) In addition to **A**, add third system placed at center pier, outside rail, either side.
    - C) Second pier from end, all four corners.
    - D) In addition to **A** or **C**, place 5th system at center pier, outside rail, either side.
    (***Except:*** When placing systems under ***(A,B&D)*** place **B** & **D** on opposite sides as shown)
11. **Strap & Anchor Placement - SEE DRAWINGS:**
Tiedowns with strap and anchor are required on single section houses and homes. (excludes ***special design*** criteria) Strap and anchor shall have a working load capacity of 3150 lbs. with a minimum ultimate capacity of 4725 lbs. Strap shall meet ASTM D3953-91. Strap and anchor shall be installed in accordance with the home manufacturer's installation instructions.

NUMBER OF FOUNDATION BRACING SYSTEMS REQUIRED FOR SEISMIC DESIGN CATEGORY D

TABLE 1
90 M.P.H. EXPOSURE C WIND AREAS
FOUNDATION BRACE MODELS 1100 I "V" and 1100 ITV

- 40 psf Live Roof Load Max -
Any home 12' to 48' in width and up to 68' in length (box) requires three (3) 1100 I"V"s (A&D). A home between 69' and 76' in length (box) requires the ***addition*** of one (1) 1100 ITV (A,B&D)

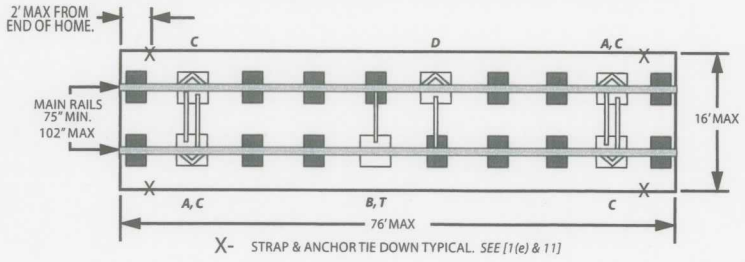
- 100 psf Live Roof Load Max -
Any home 12' to 48' in width and up to 76' in length (box) requires four (4) 1100 I"V"s (C)

TABLE 2
110 M.P.H. EXPOSURE C WIND AREAS
FOUNDATION BRACE MODELS 1100 I "V" and 1100 ITV

- 40 psf Live Roof Load Max -
Any home 12' to 48' in width and up to 68' in length (box) requires four (4) 1100 I"V"s (C). A home between 69' and 76' in length (box) requires five (5) 1100 I"V"s (C&D)

- 100 psf Live Roof Load Max -
Any home 12' to 48' in width and up to 76' in length (box) requires five (5) 1100 I"V"s (C&D).

PIER ON FOOTER PER HOUSE MANUFACTURER INSTALLATION INSTRUCTIONS



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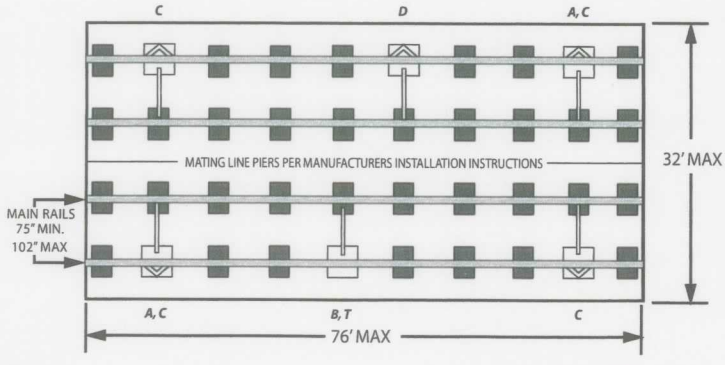

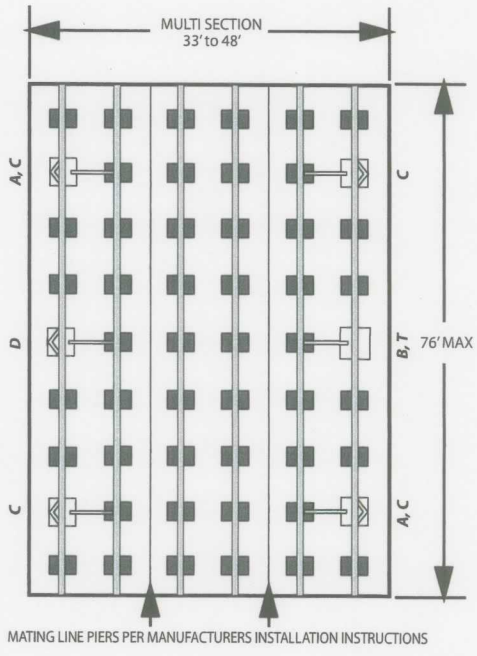

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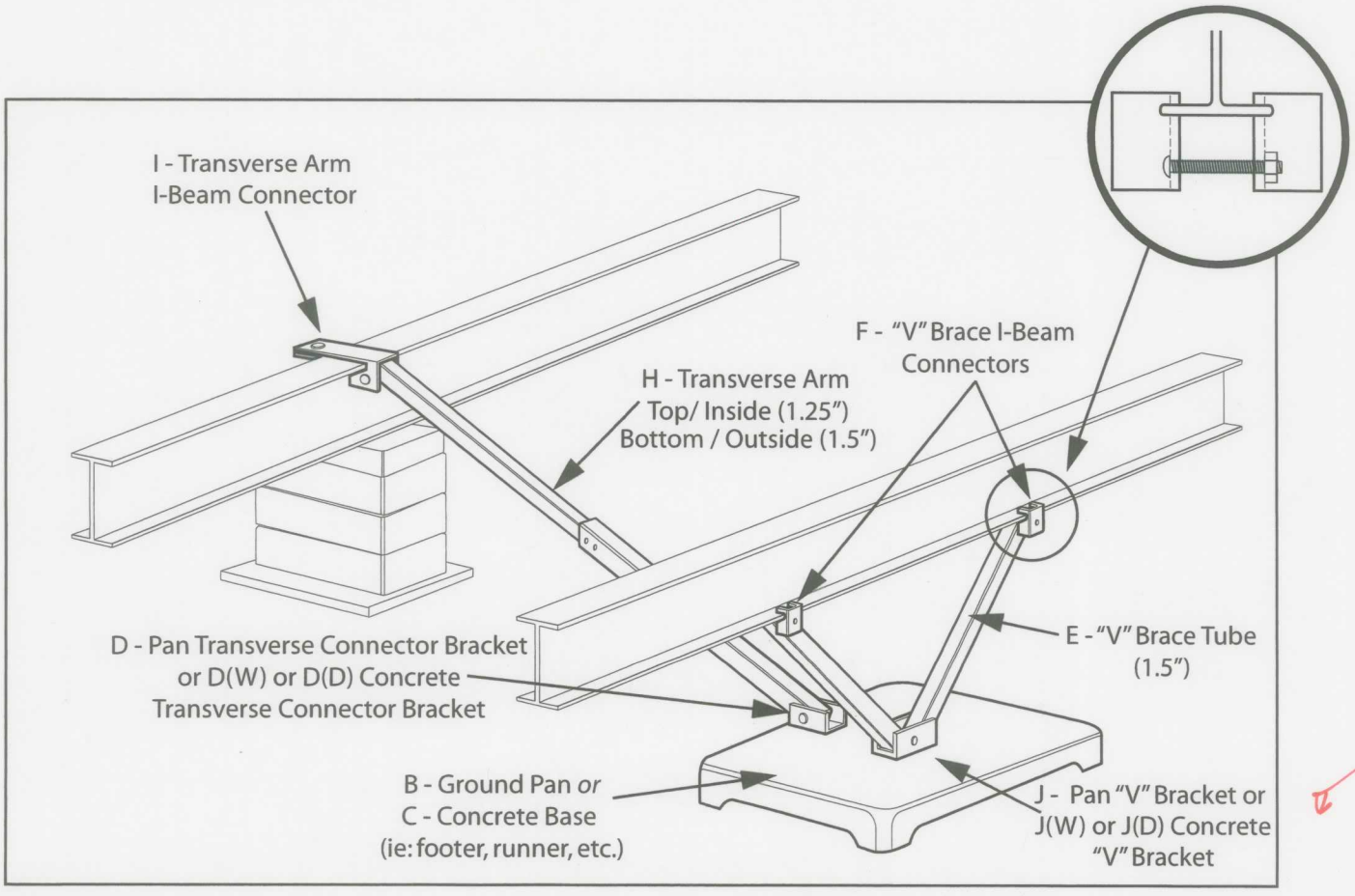
Parts List

CALL OUT	PART #	NAME	MATERIAL	FINISH SEE KEY A	COMMENT SEE KEY B
B	1100-1A-G	GROUND PAN	ASTM # A-36	**	
C	CONCRETE	CONCRETE BASE (ie: footer, runner, etc.)			***
D	1100-3-G	GROUND PAN TRANSVERSE CONNECTOR BRACKET	ASTM # A-36	**	***
D(W)	1100-W-TACA	CONCRETE WET SET TRANSVERSE CONNECTOR BRACKET	ASTM # A-36	* / **	***
D(D)	1100-D-TACA	CONCRETE DRY SET TRANSVERSE CONNECTOR BRACKET	ASTM # A-36	* / **	***
E	1.50-20-P / G	"V" BRACE 1.5" SQ. TUBE 20" LONG	ASTM # A513	* / **	
	1.50-28-P / G	"V" BRACE 1.5" SQ. TUBE 28" LONG	ASTM # A513	* / **	
	1.50-39-P / G	"V" BRACE 1.5" SQ. TUBE 39" LONG	ASTM # A513	* / **	
	1.50-44-P / G	"V" BRACE 1.5" SQ. TUBE 44" LONG	ASTM # A513	* / **	
	1.50-54-P / G	"V" BRACE 1.5" SQ. TUBE 54" LONG	ASTM # A513	* / **	
F	1100-10-P / G	"V" BRACE I-BEAM CONNECTOR	ASTM # A-36	* / **	***
H	1.50-60-P / G	TELESCOPING TRANSVERSE ARM 1.5" SQ. TUBE 60" LONG	ASTM # A513	* / **	***
H	1.50-72-P / G	TELESCOPING TRANSVERSE ARM 1.5" SQ. TUBE 72" LONG	ASTM # A513	* / **	***
H2	1.25-60-P / G	TELESCOPING TRANSVERSE ARM 1.25" SQ. TUBE 60" LONG	ASTM # A513	* / **	
H2	1.25-72-P / G	TELESCOPING TRANSVERSE ARM 1.25" SQ. TUBE 72" LONG	ASTM # A513	* / **	
I	1100-9-P / G	TRANSVERSE ARM I-BEAM CONNECTOR	ASTM # A-36	* / **	***
J	1100-11-G	GROUND PAN "V" BRACKET	ASTM # A-36	**	***
J(W)	1100-W-CPCA	CONCRETE WET "V" BRACKET	ASTM # A-36	* / **	***
J(D)	1100-D-CPCA	CONCRETE DRY "V" BRACKET	ASTM # A-36	* / **	***

KEY A * Rust Resistant Black Paint
** Zinc on Steel of .30 oz/ft

KEY B *** Hardware Required - Refer to Installation Instructions for Specifications



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