MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH
BUREAU OF CONSTRUCTION CODES & FIRE SAFETY
P.O. BOX 30254
LANSING, MI 48909

CERTIFICATE OF ACCEPTABILITY
PRODUCT APPROVAL

PA-01-0003 **03-25a**

Issued by the Michigan State Construction Code Commission in accordance with authority granted under Section 21, 1972 P.A. 230, as amended, being Section 125.1521 of the Michigan Compiled Laws, on the recommendation of the Bureau of Construction Codes, Plan Review Division.

MANUFACTURER:

MHFS Oliver Technologies, Inc.
562 Glenheather Drive
San Marcos, CA 92069

PRODUCT:

MHFS Oliver Technologies, Inc. – All Steel Longitudinal Bracing System.

MANUFACTURER DESIGNATION:

Model 1100 ILC "V"

CONDITIONS OF USE AND INSTALLATION:

1. This product shall bear identification as listed above.
2. Used and installed in accordance with the building code in effect at the time of installation.
3. Used and installed in accordance with the manufacturer's instruction and the H.U.D. load limit criteria.

THIS CERTIFICATE SHALL NOT BE USED FOR ADVERTISING PURPOSES.

By Direction of the Construction Code Commission

Henry L. Green, Executive Director

Irvin J. Poke, AIA – Chief, Plan Review Division

Effective Date: March 5, 2003 (Revised February 17, 2005)

MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH
BUREAU OF CONSTRUCTION CODES & FIRE SAFETY
P.O. BOX 30254
LANSING, MI 48909

CERTIFICATE OF ACCEPTABILITY
PRODUCT APPROVAL

PA-01-0001 **03-25b**

Issued by the Michigan State Construction Code Commission in accordance with authority granted under Section 21, 1972 P.A. 230, as amended, being Section 125.1521 of the Michigan Compiled Laws, on the recommendation of the Bureau of Construction Codes, Plan Review Division.

MANUFACTURER:

MHFS Oliver Technologies, Inc.
562 Glenheather Drive
San Marcos, CA 92069

PRODUCT:

MHFS Oliver Technologies, Inc. –All Steel Transverse Bracing System.

MANUFACTURER DESIGNATION:

Model 1100 ITC "V"

CONDITIONS OF USE AND INSTALLATION:

1. This product shall bear identification as listed above.
2. Used and installed in accordance with the building code in effect at the time of installation.
3. Used and installed in accordance with the manufacturer's instruction and the H.U.D. load limit criteria.

THIS CERTIFICATE SHALL NOT BE USED FOR ADVERTISING PURPOSES.

By Direction of the Construction Code Commission

Henry L. Green, Executive Director

Irvin J. Poke, AIA – Chief, Plan Review Division

Effective Date: March 5, 2003 (Revised February 17, 2005)

MICHIGAN DEPARTMENT OF CONSUMER & INDUSTRY SERVICES
BUREAU OF CONSTRUCTION CODES & FIRE SAFETY
P.O. BOX 30254
LANSING, MI 48909

CERTIFICATE OF ACCEPTABILITY
PRODUCT APPROVAL

1521-BA

Issued by the Michigan State Construction Code Commission in accordance with authority granted under Section 21, 1972 P.A. 230, as amended, being Section 125.1521 of the Michigan Compiled Laws, on the recommendation of the Bureau of Construction Codes & Fire Safety, Plan Review Division.

MANUFACTURER:

Oliver Technologies, Inc.
467 Swan Avenue
Hohenwald, TN 38482

PRODUCT:

All Steel Foundation System – Longitudinal and Transverse Bracing System.

MANUFACTURER DESIGNATION:

Model No. 1100 ICV

CONDITIONS OF USE AND INSTALLATION:

1. This product shall bear identification as listed above.
2. Used and installed in accordance with the building code in effect at the time of installation.
3. Used and installed in accordance with the manufacturer's instruction and the H.U.D. load limit criteria.

THIS CERTIFICATE SHALL NOT BE USED FOR ADVERTISING PURPOSES.

By Direction of the Construction Code Commission

Henry L. Green, Executive Director

Irvin J. Poke, AIA – Chief, Plan Review Division

Effective Date: May 7, 2003

RAY TUCKER. P.E.
Consulting Professional Engineer
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(310) 315-5745
FAX (310) 943-1643
Tuckray@msn.com

February 27, 2003

Mr. Scott Oliver
Oliver Technologies, Inc.
467 Swan Avenue
Hohenwald, TN 38462

Re: 1100 C System Footer Size

Dear Mr. Oliver:

The tested and approved 1100 C V All Steel Foundation System incorporates a 21" x 21"square x 6" deep concrete footer in place of the standard steel pan used in the 1100V system. You have asked my opinion on the feasability of using a 16" diameter round footer with a depth greater than 6" in lieu of the 21" x 21" square footer. It is assumed that this round footer would be concrete poured in place in a drilled hole with minimal disturbance of the surrounding soil.

The 1100 C V ASF system depends on the weight that is applied by the manufactured house through the system to the footer to resist horizontal movement of the home during a wind event. The horizontal movement is resisted by a combination of the friction force between the bottom of the footer and the earth, and by the lateral resistance of the earth against the depth of the footer.

For the square footer, the area of the footer base is:

$$21" \times 21" = 441 \text{ sq in}$$

While the area of the round footer is:

$$8" \text{ pi } r^2 = 201 \text{ sq in}$$

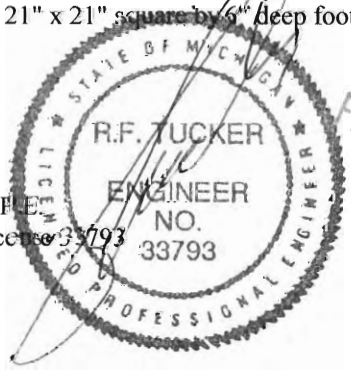
This represents a 441-201/441 = 54% reduction in friction area.

It is my opinion that this reduction in the area of friction resistance will be offset by a proportionate increase in the area of lateral resistance provided by the footer depth:

$$6" \times 1.54 = 9.24"$$

However, because certain assumptions were made in arriving at this conclusion, an additional factor of safety is recommended. Therefore, it is my professional opinion that a 16" diameter by 12" deep footer can be used in lieu of the specified 21" x 21" square by 6" deep footer. The edge distances required by the installation instructions must be maintained.

Sincerely,



FEB 27 2003

Ray Tucker, P.E.
Michigan License 33793

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Consulting Professional Engineer
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November 18, 2003

Mr. Scott Oliver
Oliver Technologies, Inc.
467 Swan Avenue
Hohenwald, TN 38562

Re: Model 1100 V System Spacing

Dear Mr. Oliver:

It has come to my attention that page 2 of the OTI installation instructions dated 9/03 incorporates a note relative to system location which is contrary to previously approved installation instructions. Note h), which reads "The systems are to be installed at the 2nd pier in from each end of the house, but not further than the 3rd pier" This note is in error.

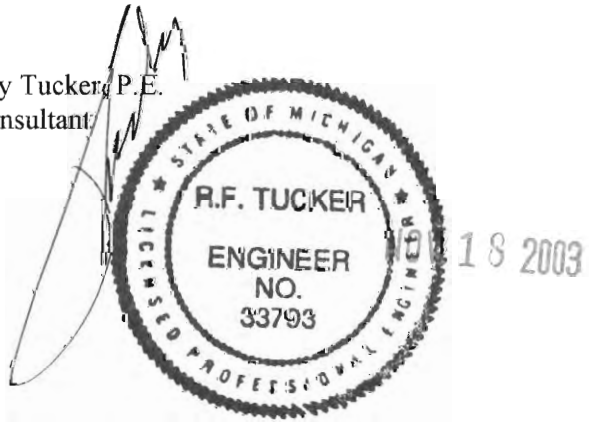
While it is recommended that the systems be installed at the second pier in from each end of the house, they may be installed at any location in from the ends of the house, not to exceed ¼ of the length of the home.

It is suggested that Note h) be revised to read:

> h) It is recommended that the systems be installed at the 2nd pier in from each end of the house. However, they may be installed at any location at least two feet, but not more than ¼ the house length, in from the ends of the house.

Please contact me with any questions or concerns.

Ray Tucker, P.E.
Consultant



OLIVER TECHNOLOGIES, INC.
INSTALLATION INSTRUCTIONS FOR WIND ZONE 1
MODEL 1100 "V" SERIES ALL STEEL FOUNDATION SYSTEM

PATENT PENDING

Revision 8/03

OLIVER TECHNOLOGIES, INC.
INSTALLATION INSTRUCTIONS FOR THE
1100 "V" SERIES
ALL STEEL FOUNDATION SYSTEM PATENT PENDING
MODEL 1100 "V" (STEPS 1-11)
MODEL 1100 T "V" TRANSVERSE ONLY:
FOLLOW INSTRUCTIONS 1-3 , 9-11

ENGINEERS STAMP

ENGINEERS STAMP
R.F. TUCKER
ENGINEER
NO. 33793

1. SPECIAL CIRCUMSTANCES: If the following conditions occur - *STOP! Contact Oliver Technologies at 1-800-284-7437*:
a) Pier (system) height exceeds 48" **b)** Roof eaves exceed 16" **c)** Sidewall height exceed 96" **d)** Roof Pitch greater than 5/12 (23 degrees)
e) Location is within 1500 feet of coast line **f)** Footing to surface area exceeds 3 square feet **g)** Soil conditions less than 4B

INSTALLATION OF GROUND PAN

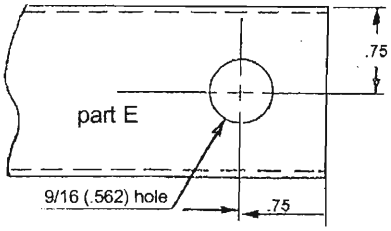
2. Remove weeds and debris in an approximate three foot square to expose firm, level undisturbed soil or controlled fill for each ground pan (C) . Top of ground pan must be installed at ground level or per local jurisdiction.
3. Place ground pan (C) directly below chassis I-beam . Press or drive pan firmly into soil until flush with or below soil.
SPECIAL NOTE: The longitudinal "V" brace system serves as a pier under the home and should be loaded as any other pier. It is recommended that after leveling piers, and one-half inch (1/2") before home is lowered completely on to piers, complete items 4 through 8 below.

INSTALLATION OF LONGITUDINAL "V" BRACE SYSTEM

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

Pier Height = the dimension from the top of pan to the bottom of I-beam

PIER HEIGHT (Min. 40 degrees / 60 degrees Max.)	1.50" Tube Length
14" to 19"	20"
18" to 25"	28"
24" to 35"	39"
30" to 40"	44"
36" to 48"	54"



5. Install both of the 1.50 " square tubes (E) into the "U" bracket (J), insert carriage bolt and leave nut loose for final adjustment.
6. Place I-beam connector (F) loosely on the bottom flange of the I-beam.
7. Attach the selected 1.5" tubes (E) to the I-beam connectors (F) and fasten loosely with bolts and nuts. Note: The ground pan must be level in both directions to ensure the angle markings on the centerpoint connector are correct from the horizontal plane of the pan. 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 part E.)
8. Using standard hand tools, tighten all nuts and bolts. When connecting the brace tube to the model 1100-10-P I-beam connector bracket tighten at least one and a half to two full turns past hand tight.

INSTALLATION OF LATERAL TELESCOPING TRANSVERSE ARM SYSTEM

9. Select the correct square tube brace (H) length for set-up lateral transverse at support location. The lengths come in either 60" or 72" lengths. (With the 1.50" tube as the bottom tube, and the 1.25" tube as the inserted tube.)
10. Install the 1.50 transverse brace (H) to the ground pan connector (D) with bolt and nut.
11. Slide 1.25" transverse brace into the 1.50" brace and attach to adjacent I-beam connector (I) with bolt and nut.
12. Secure 1.50" transverse arm to 1.25" transverse arm using four (4) 1/4" - 14 x 3/4" self-tapping screws in pre-drilled holes.

INSTALLATION USING CONCRETE RUNNER / FOOTER

13. A concrete runner, footer or slab may be used in place of the steel ground pan. The concrete footer, runner or slab may be any shape that has the minimum of 2646 cu.in. with a minimum depth of 3 1/2" slab or 6" (wet or dry set), and 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: 21" X 21" X 6"). The concrete shall be minimum 2500 psi mix (pre-blended sacked concrete mix is acceptable) . Special inspection of the anchor installations is not required. If the 1100 ITC transverse system is to be installed without using the 1100 ILC longitudinal system, it shall be installed a maximum of 18" from a pier. **NOTE: The bottom of all footings, pads, slabs and runners must be per local jurisdiction.**

LONGITUDINAL:

14. When using the 1100(J-wet set) bracket, simply install the bracket in runner/footer **OR**
When installing in cured concrete use the 1100(J-dry set) bracket. The 1100 (dryset) CA bracket is attached to the concrete using (2) 1/2" x 3" concrete wedge bolts. Place the CA 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 (dry set) CA 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 nuts.

LATERAL:

15. For wet set (part # 1100-W-TACA) installation simply install the anchor bolt into runner/footer. For dry set installation (part # 1100-W-TACA) 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 hole. Place wedge bolts (Powers part# 5034 1/2" X 4" or equivalent) into (D) concrete dry transverse connector and into drilled hole. 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), then remove the nut. The sleeve of concrete wedge bolt needs to be at or below the top of concrete.

NOTE:

a) Installation of the longitudinal system eliminates the need for longitudinal anchors.

b) Installation of the transverse system eliminates the need for all anchors, diagonal frame ties and stabilizer plates except when noted. (Legend #5).

c) All other home manufacturer's instructions for installation of stabilizing devices must be followed, including installation of sidewall vertical tie-down anchors, and mating line column, shear wall or center-line 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 will require the installation of four (4) ground anchors with tie-down straps, one at each corner not more than 2 ft. from the ends of the home. Ground anchor and tie-down straps to be rated for min. 3150 lbs.

f) When the Length of home exceeds 76', or the roof pitch is between 4.37/12 (20 degrees) and 5/12 add 1 transverse system (see location diagrams below.) {6/12: a total of 4 Transverse & 3 Longitudinal systems are needed & 7/12: a total of 5 Transverse & 3 Longitudinal systems are needed. (Longitudinal portion only required when when longitudinal bracin is required by home manufacturer.)}

g) An alternative method using the 1100 CVD anchors (dry set) or 1100 CVW (wet set) may be used on a footing size of 16" diameter X 24" depth. These brackets are designed for lateral and longitudinal protection.

h) The systems are to be installed at the 2nd pier in from each end of the house, but not furthur than the 3rd pier.

FOR STATE OF MICHIGAN ONLY: As required by Section 1805.2 of the 2000 Michigan Building Code, the depth of the footer shall be a minimum depth of 42 inches below grade, except that the authority having jurisdiction may approve a lesser depth based on known prevailing soil and weather conditions, or as provided by the exception under Section 1805.2.1 of the Code.

FOR STATE OF ALABAMA ONLY: 1. Maximum pier height is limited to 32" with pier defined in the Alabama Regulation as " that portion of the support system between the top of the footing and the bottom of the pier cap." 2. The State of Alabama limits the use of this system to H.U.D labeled homes.

FOR STATE OF NORTH CAROLINA ONLY: When the manufacturer's installation instructions are not available, vertical wall tie-downs must be installed not to exceed 8-feet on center. (Wind Zone II)

LEGEND:

1. LENGTH OF HOUSE IS THE ACTUAL *BOX SIZE*

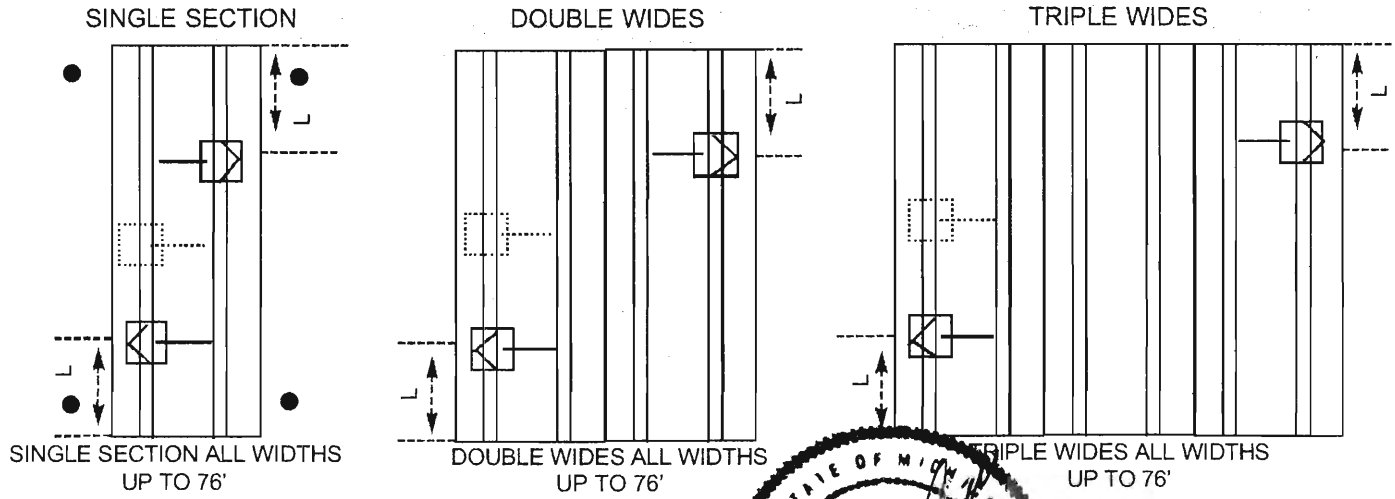
2. L = APPROXIMATE LOCATION OF THE SYSTEM (SEE RECOMMENDATION)

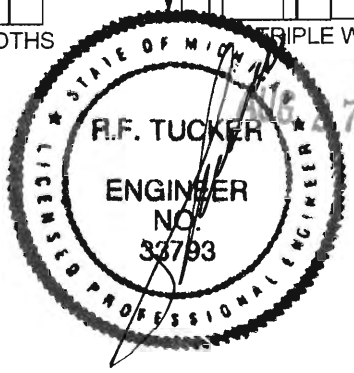
3. = LOCATION OF ASF MODEL 1100 "V" (LATERAL & LONGITUDINAL BRACING). OR 1100 T (LATERAL ONLY) UP TO 4.37/12 ROOF PITCH

4. = LOCATION OF ADDITIONAL ASF MODEL 1100 T "V" SYSTEM (LATERAL ONLY) FOR HOMES EXCEEEDING 76' IN LENGTH OR WITH ROOF PITCH BETWEEN 4.37/12 (20 DEGREES) AND 5/12. THE ADDITIONAL SYSTEM IS TO BE INSTALLED AT APPROXIMATELY THE MID POINT OF THE HOUSE, AND MAY BE INSTALLED AT EITHER EXTERIOR BEAM.

5. ● = INSTALLATION OF SINGLE WIDE HOMES REQUIRE 2 ANCHORS PER SIDE LOCATED NOT MORE THAN 2 FEET FROM EACH END. (WITH A MINIMUM OF 3150 LOAD RATING)

REQUIRED NUMBER AND LOCATION OF MODEL 1100 "V" SERIES BRACES





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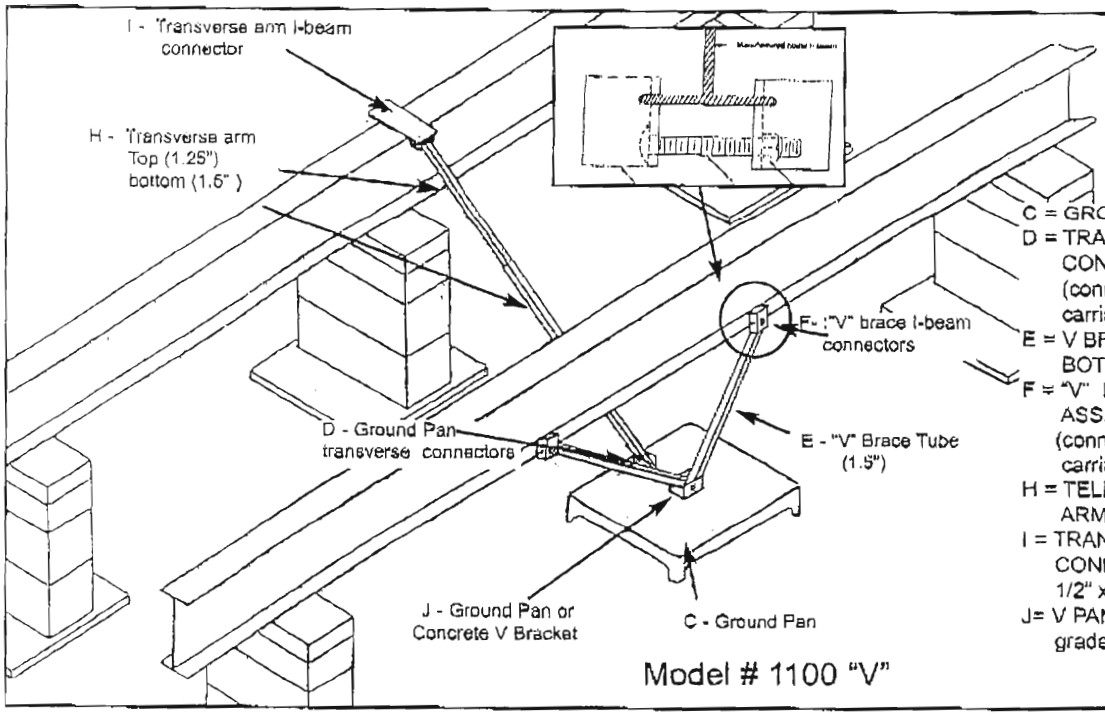
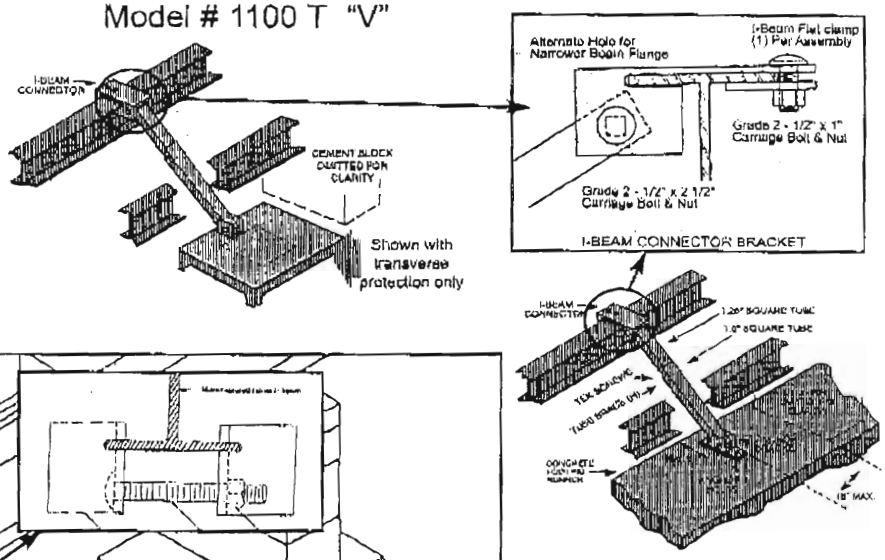


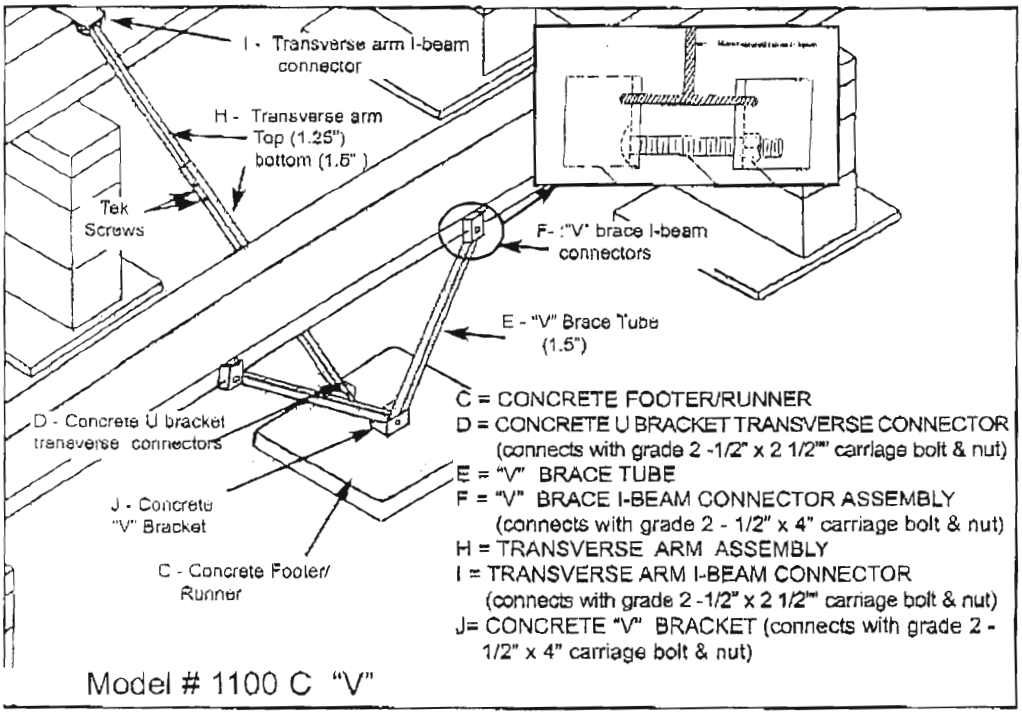
C = GROUND PAN
D = TRANSVERSE GROUND PAN CONNECTOR U BRACKET (connects with grade 2 -1/2" x 2 1/2"" carriage bolt & nut)
E = V BRACE TUBE ASSEMBLY W/ 1.5 BOTTOM TUBE
F = "V" BRACE I-BEAM CONNECTORS ASSEMBLY Model #1100-10-P (connects with grade 2 - 1/2" x 4" carriage bolt & nut)
H = TELESCOPING TRANSVERSE ARM ASSEMBLY
I = TRANSVERSE ARM I-BEAM CONNECTOR (connects with grade 2 - 1/2" x 2 1/2"" carriage bolt & nut)
J= V PAN U BRACKET (connects with grade 2 - 1/2" x 4" carriage bolt & nut)

Model # 1100 "V"

Model # 1100 T "V"

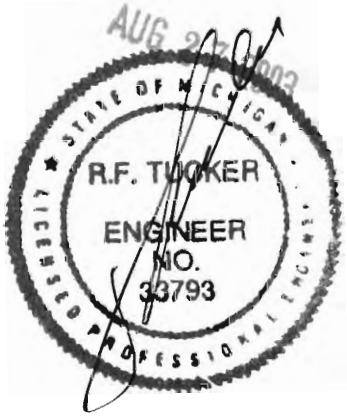


Model # 1100 TC "V"



C = CONCRETE FOOTER/RUNNER
D = CONCRETE U BRACKET TRANSVERSE CONNECTOR (connects with grade 2 -1/2" x 2 1/2"" carriage bolt & nut)
E = "V" BRACE TUBE
F = "V" BRACE I-BEAM CONNECTOR ASSEMBLY (connects with grade 2 - 1/2" x 4" carriage bolt & nut)
H = TRANSVERSE ARM ASSEMBLY
I = TRANSVERSE ARM I-BEAM CONNECTOR (connects with grade 2 -1/2" x 2 1/2"" carriage bolt & nut)
J= CONCRETE "V" BRACKET (connects with grade 2 - 1/2" x 4" carriage bolt & nut)

Model # 1100 C "V"

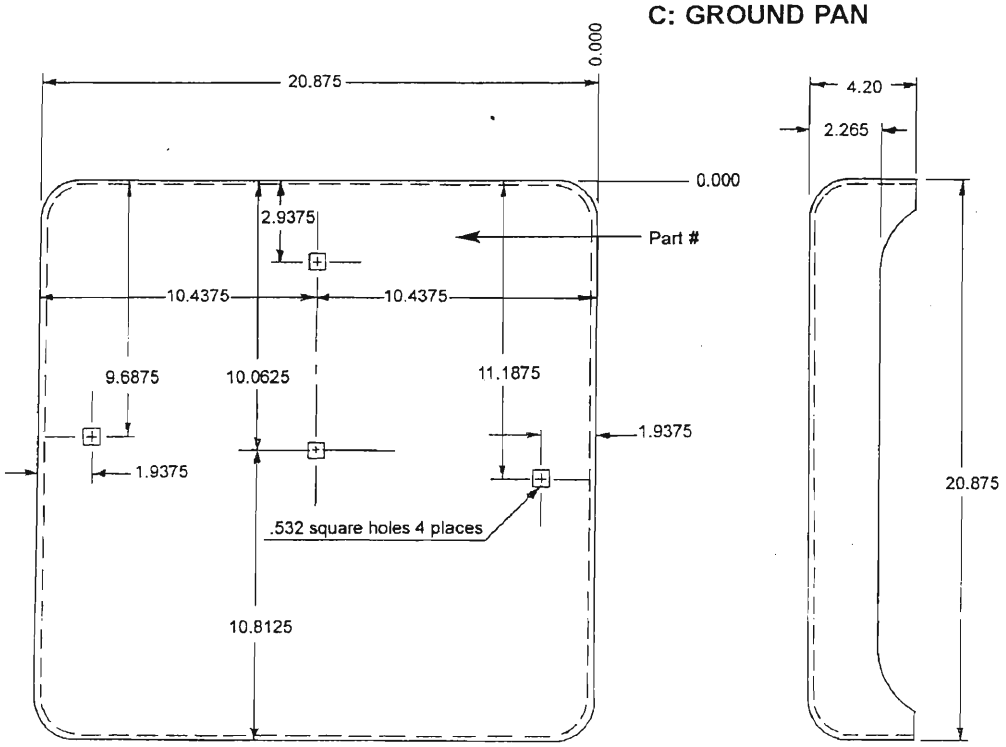


MANUFACTURED HOUSING FOUNDATION SYSTEMS
A DIVISION OF OLIVER TECHNOLOGIES, INC.
1-800-284-7437 Fax: 931-796-8811
www.olivertechnologies.com

SPECIFICATIONS

OLIVER TECHNOLOGIES, INC. ~ MODEL 1100 "V"

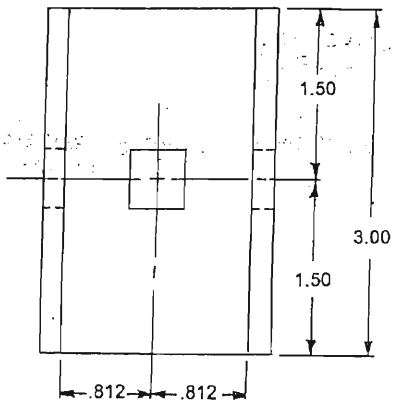
C: GROUND PAN

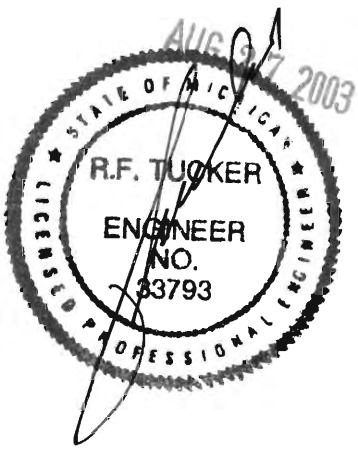


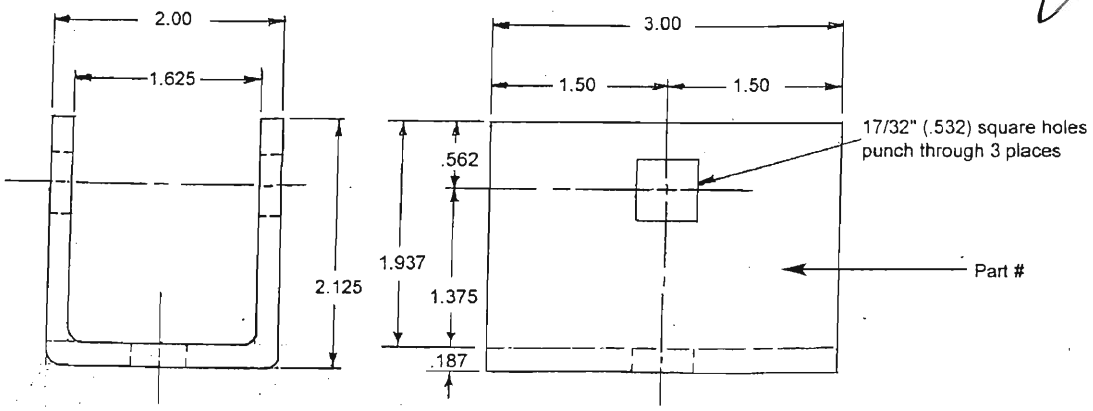
Title: Ground pan for all steel foundation system - material: .105 nom.X24.625Xcoil
Finish: Hot dipped zinc galvanizing - A.S.T.M. standard#123-89A-.60 ounces per sq. ft. or zinc coated to A.S.T.M. (A929/A929M-96)
Part # 1100-1A-G
3-6-02

D: GROUND PAN TRANSVERSE CONNECTOR

Detail: crossbrace ground pan connector
Stock size: 3/16" G-60-Galv. coil stock for stamping
Part # 1100-3-G
10-12-99







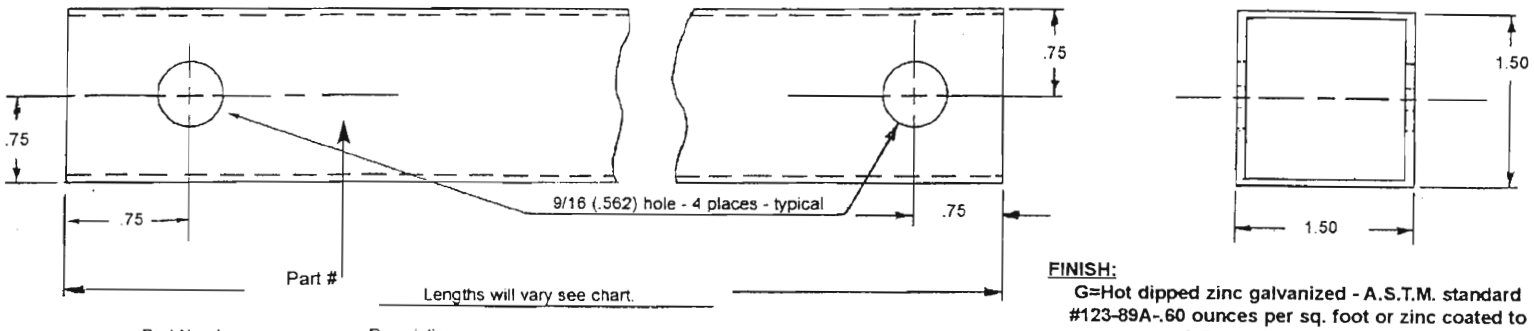
revision 11/02

SPECIFICATIONS

OLIVER TECHNOLOGIES, INC. ~ MODEL 1100 "V"

1 1/2" square tubing - 14 ga. (.079 nom.) wall - A.S.T.M. - A513 2/26/01

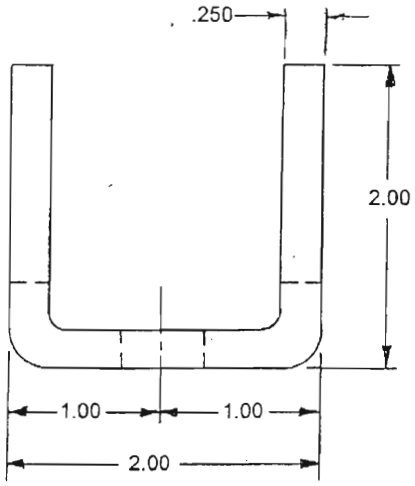
E: "V" BRACE TUBE



Part Number	Description
1.50 - 20 - P or G	1 1/2" sq. tube 20" long
1.50 - 28 - P or G	1 1/2" sq. tube 28" long
1.50 - 39 - P or G	1 1/2" sq. tube 39" long
1.50 - 44 - P or G	1 1/2" sq. tube 44" long
1.50 - 54 - P or G	1 1/2" sq. tube 54" long
1.50 - 60 - P or G	1 1/2" sq. tube 60" long
1.50 - 72 - P or G	1 1/2" sq. tube 72" long

FINISH:
G=Hot dipped zinc galvanized - A.S.T.M. standard #123-89A-.60 ounces per sq. foot or zinc coated to A.S.T.M. (A929/A929M-96)
OR
P=Rust resistant black paint.

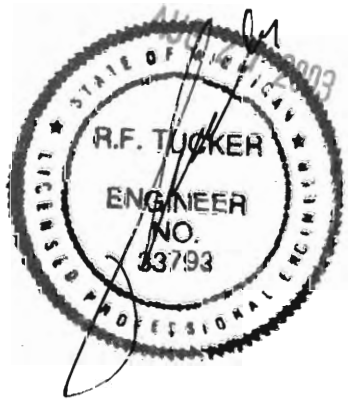
Note: Suffix letter at end of part # means - P=painted or G=galvanized.

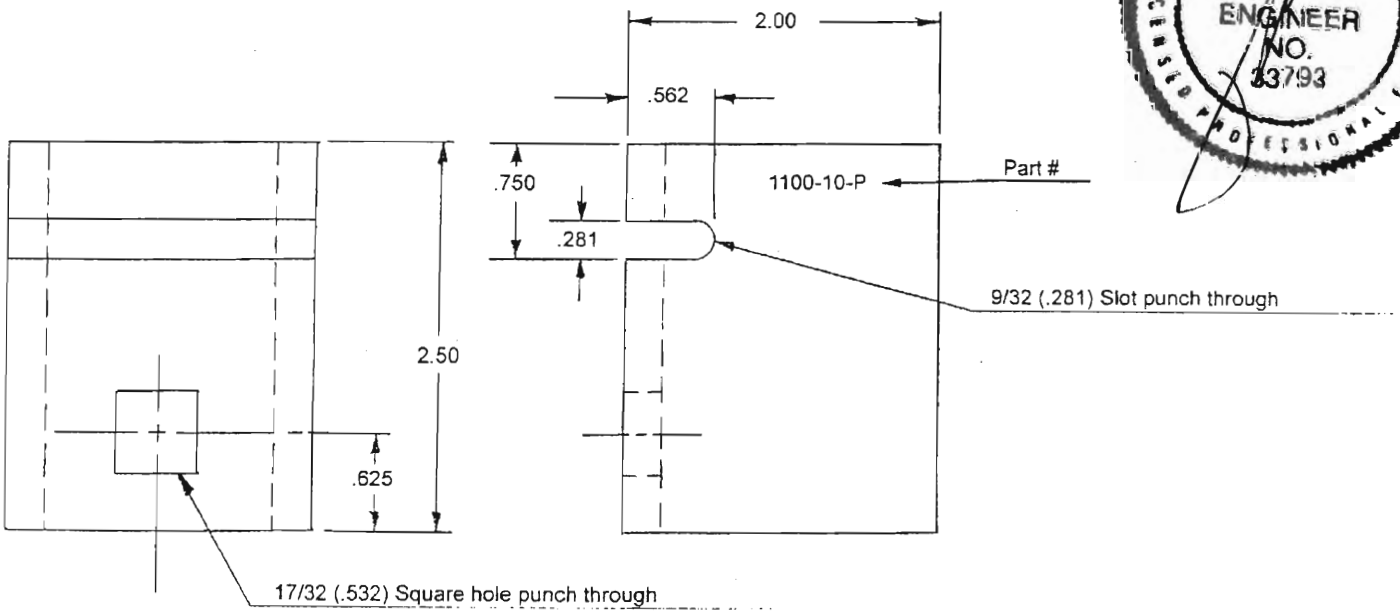


Detail: I-beam clamp - Model# 1100-10-P
1/4" coil stock - H.R.S.
11/28/01

FINISH: Rust resistant black paint.

F: "V" BRACE I-BEAM CONNECTORS ASSEMBLY



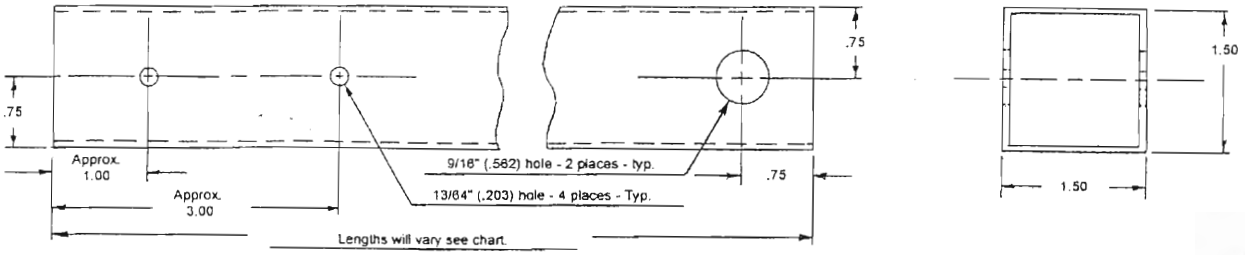


SPECIFICATIONS

OLIVER TECHNOLOGIES, INC. ~ MODEL 1100 "V" (CONCRETE)

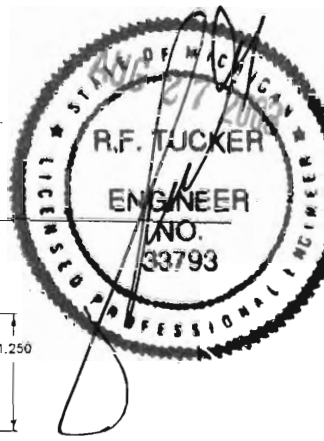
H: TELESCOPING TRANSVERSE ARM ASSEMBLY

1 1/2" square tubing - 14 ga. (.079 nom.) wall - A.S.T.M. - A513 2/26/01

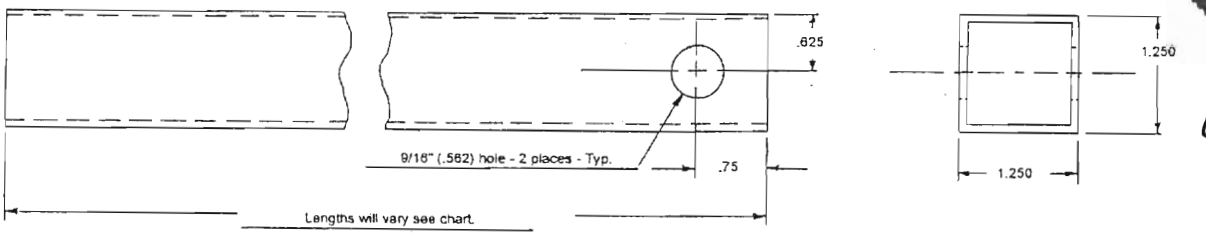


Part Number	Description
1.50-60-P or G	1 1/2" tube 60" long
1.50-72-P or G	1 1/2" tube 72" long

Note: Suffix letter at end of part # means - P=painted or G=galvanized.



1 1/4" square tubing - 14 ga. (.079 nom.) wall - A.S.T.M. - A513

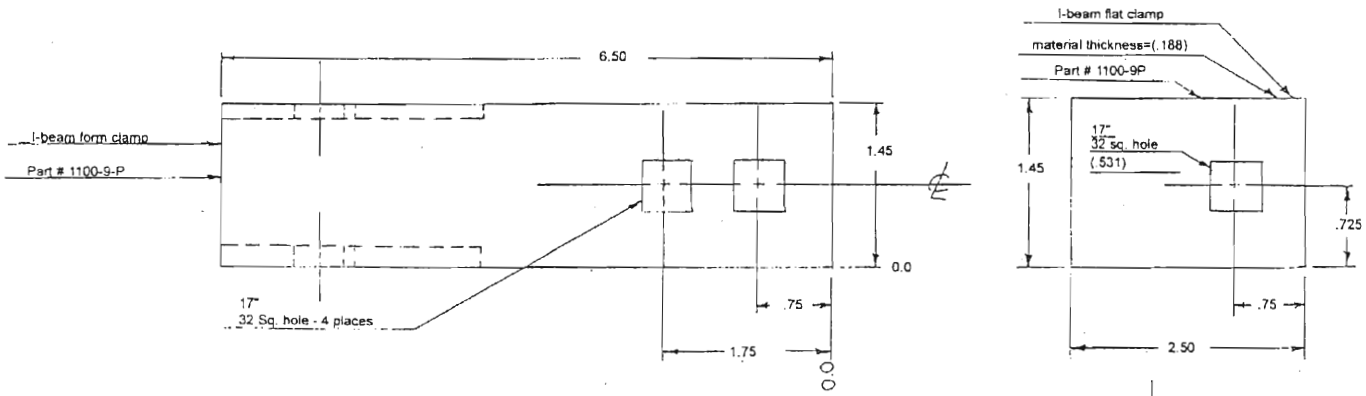


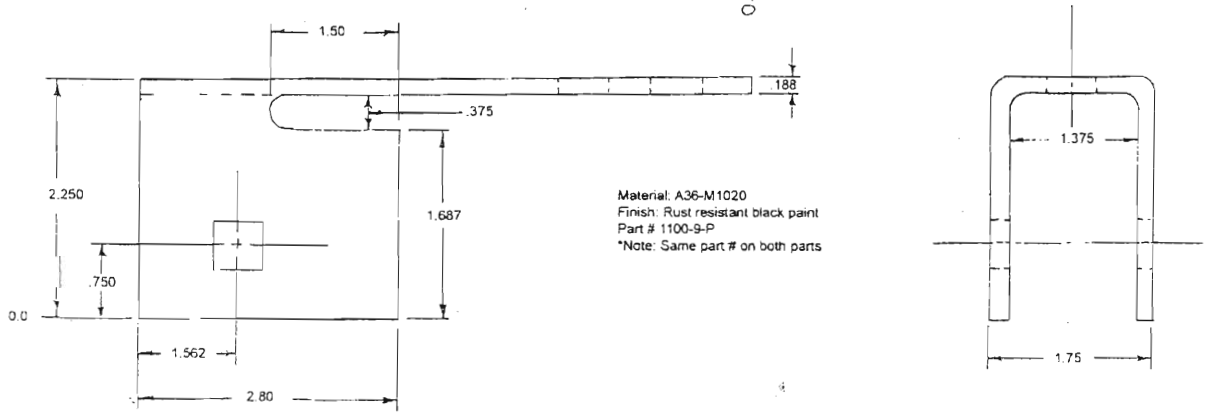
Part Number	Description
1.25-60-P or G	1 1/4 Sq. tube 60" long
1.25-72-P or G	1 1/4 Sq. tube 72" long

Note: Suffix letter at end of part # means - P=painted or G=galvanized.

I: TRANSVERSE ARM I-BEAM CONNECTOR

Detail: I-beam connector - 2 pieces (form clamp & flat clamp) per assembly.
Fasteners required: (one) Grade 2-1/2"-13X1" carriage bolt and hex nut,and (one) Grade 2-1/2"-13X2 1/2"-carriage bolt & hex nut. "DO NOT SCALE" 5/16/00



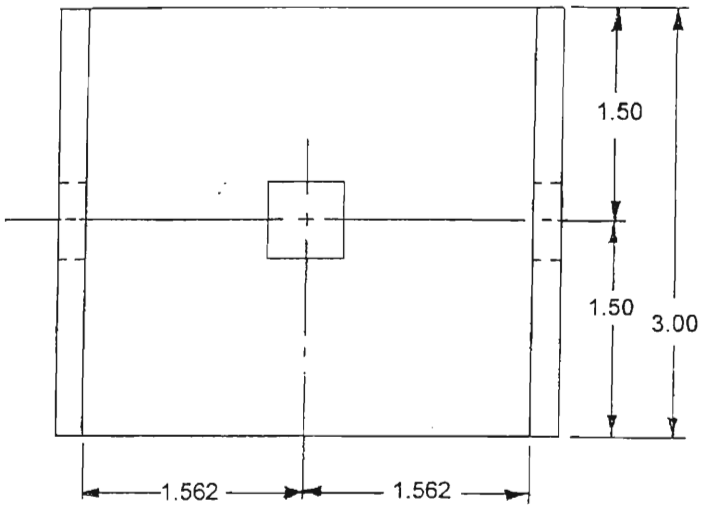


Material: A36-M1020
Finish: Rust resistant black paint
Part # 1100-9-P
*Note: Same part # on both parts

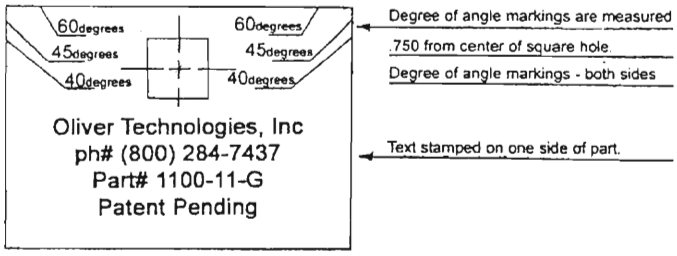
SPECIFICATIONS

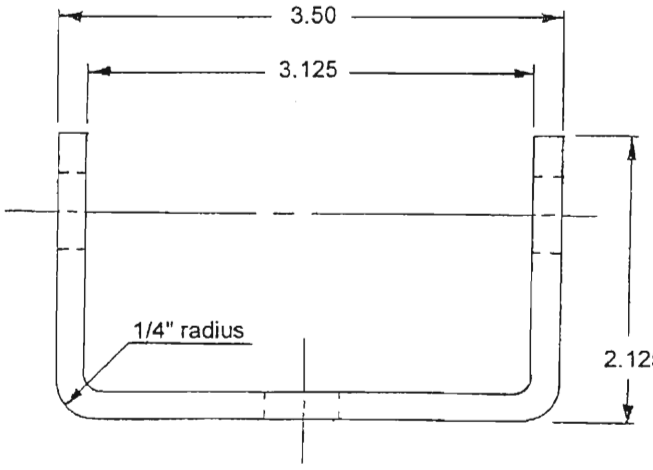
OLIVER TECHNOLOGIES, INC. ~ MODEL 1100 "V"

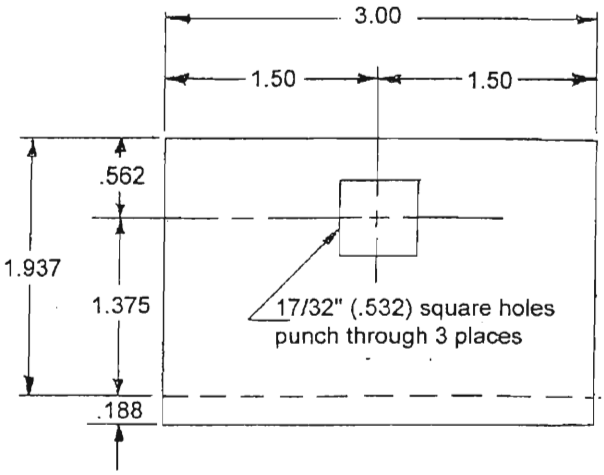
Detail: Centerpoint ground pan connector
3/16" coil stock-G-40 galvanized
Part# 1100-11-G
11-28-01



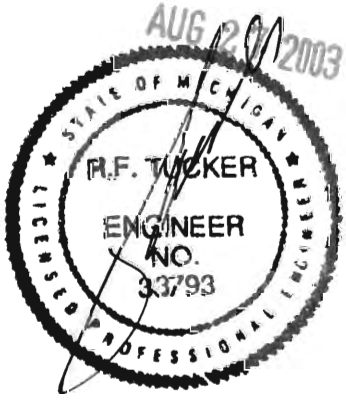
Title: Text to be stamped on center point ground pan connector
Part# 1100-II-G





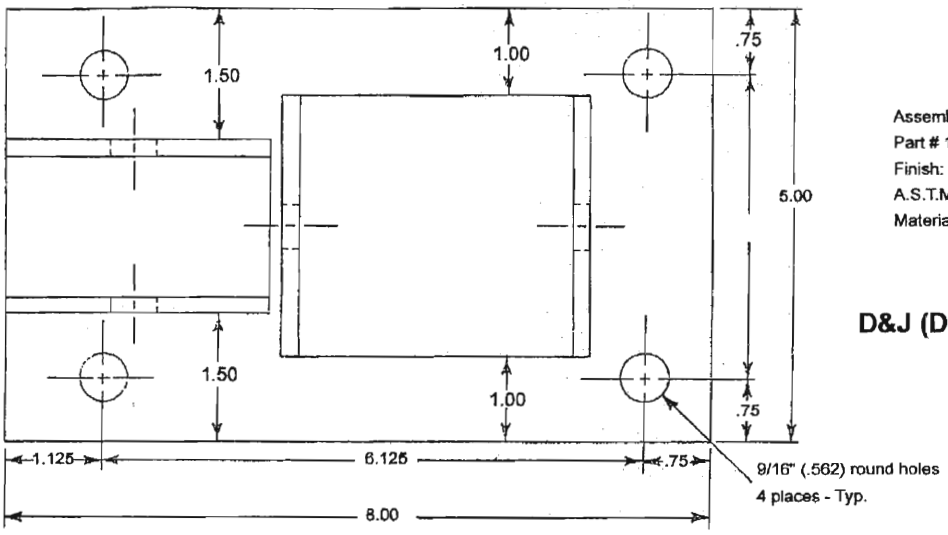


J: "V" BRACKET



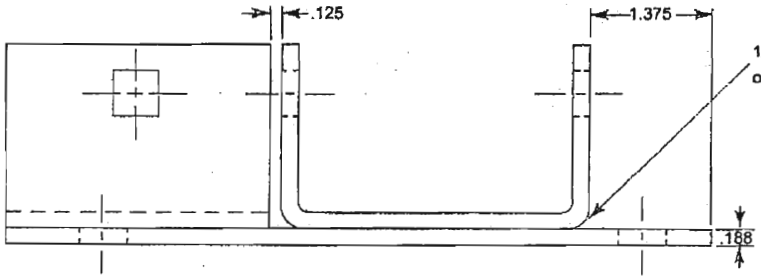
COMPONENT SPECIFICATIONS

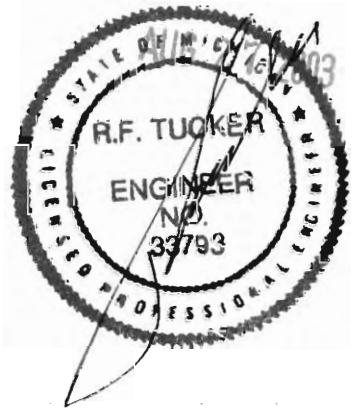
OLIVER TECHNOLOGIES, INC. ~ MODEL 1100 "V" (CONCRETE)



Assembly view: Full system - Dry
Part # 1100 CVD M
Finish: Rust resistant black paint
A.S.T.M. standard # 123-89A-.60 ounces per sq. ft.
Material: A36-M1020 steel

D&J (DRY SET): CONCRETE "V" BRACKET &TRANSVERSE BRACKET





D&J (WET SET): CONCRETE "V" BRACKET &TRANSVERSE BRACKET

Detail: Welded assembly - Full system - wet
Part # 1100 CVW M
Finish: Rust resistant black paint
A.S.T.M. standard # 123-89A-.60 ounces per sq. ft.
Material: A36-M1020 steel