RAY TUCKER, P.E.
Consulting Professional Engineer
21301 Evalyn Avenue
Torrance, CA 90503
(310) 316-5745
FAX (561) 594-0570
Tuckray@msn.com

Mr. Tracy Bain
Oliver Technologies, Inc.
467 Swan Avenue
Hohenhald, TN 38462

Re: ABS Plastic Wedge Certification

Dear Mr. Bain:

I have reviewed the Product Testing, Inc. test report titled Load Testing on Oliver Technologies ABS Plastic Wedges for Certification with State of Florida, Job #00-2501, dated March 31, 2000. I fully concur with the test protocol used and the test results. When installed as specified, the wedges will support the design loads shown in the report.

Sincerely,

R. F. Tucker

Load Testing on Oliver Technologies
ABS Plastic Wedge, for Certification
with State of Florida

Product Testing, Inc.
Job #00-2501

Prepared for:

Manufactured Housing Fdn Systems
a division of Oliver Technologies, Inc.
P.O. Box 9
Hohenwald, TN 38462

Attention:

Mr. Jim Oliver, President
March 31, 2000

PRODUCT TESTING, INC.

Street Address
111 Spring Street, Unit D
Jacksonville, Florida 32254

(904) 384-8150
FAX (904) 384-8154

Mailing Address
P.O. Box 37634
Jacksonville, Florida 32236

Manufactured Housing Fdn Systems
a division of Oliver Technologies, Inc.
P.O. Box 9
Hohenwald, TN 38462
Attn: Mr. Jim Oliver, President

March 31, 2000
Job #00-2501

RE: Load Testing on ABS Plastic Shim Wedge for Certification with State of Florida

Dear Mr. Oliver:

On March 23, 2000, Product Testing, Inc. conducted three (3) consecutive vertical load tests on an ABS plastic shim wedge that was manufactured by Manufactured Housing Foundation Systems, a division of Oliver Technologies, Inc. and have prepared the attached load vs deflection results obtained. The testing was performed in Jacksonville, Florida, at our facility, and was witnessed by Mr. David W. Cowfer, representative of the State of Florida. The load testing was conducted in accordance with a test procedure that was submitted by Mr. Phil Bergelt, of the State of Florida, Department of Highway Safety & Motor Vehicles. A copy of the test procedure is enclosed with this report.

The ABS plastic shim wedge, Model No. Oliver Technologies ABS Plastic Wedge met the specification requirements of 3,600 pounds with a deflection of 0.040 inches or less and a safety factor of 2.5 times the working load, to obtain a vertical ultimate load of 9,000 pounds without failure. Attached to this cover report are the load vs deflection chart, graph, measurements, drawing, procedure used and photographs.

Product Testing, Inc. is appreciative of the opportunity to provide this service to you and if there should be any questions concerning this report, please do not hesitate to contact us at (904) 384-8150.

Respectfully submitted,
PRODUCT TESTING, INC.

J.L. Prophet,
President

COLORADO REGISTERED R.F. TUCKER 20918 PROFESSIONAL ENGINEER

C.R. Caudel, P.E.
Sr. Registered Engineer

TABLE OF CONTENTS

SECTION A

SUMMARY

The Oliver Technologies ABS Plastic Wedge was vertically loaded in five hundred (500) pound increments, to 3,600 pounds (100% of the working load) and to 9,000 pounds (safety factor of 2.5 times the working load). After three (3) consecutive tests, the ABS plastic wedge did not exceed the maximum deflection of 0.040 inches with the 3,600 pound load. After the loads were released, the wedge was visually inspected for signs of cracking, splitting or disfigurement, none of which were found. There were very slight imprints on the bottom of the wedge where the wedge was placed on the concrete cap block per the procedure provided by the State of Florida (See Section F for copy).

SECTION B

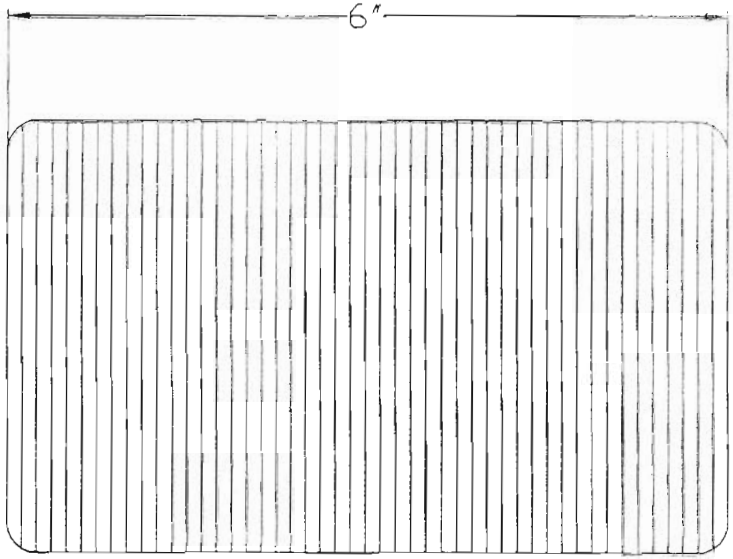
Actual Measurements of Oliver Technologies ABS Plastic Wedge

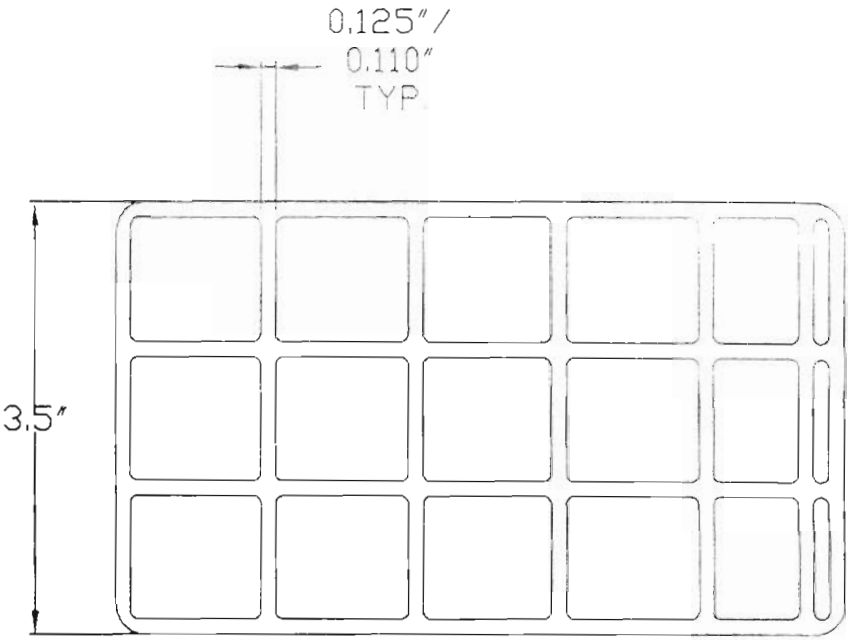
1.	Total Thickness	0.951"
2.	Top Shim Thickness	0.951"
3.	Bottom Shim Thickness	0.040"
4.	Overall Width	3.502"
5.	Overall Length	6.007"
6.	Maximum Height at 2.5" Bearing Surface	1.496"
7.	Minimum Height at 2.5" Bearing Surface	0.478"
8.	Type of Material	ABS Plastic
9.	Color	Black
10.	Type of Design	Waffle
11.	Wall Thickness	0.110"
12.	Wedge Marking	None
13.	Serial Number	None
14.	Type of Locking Surface	Saw Tooth

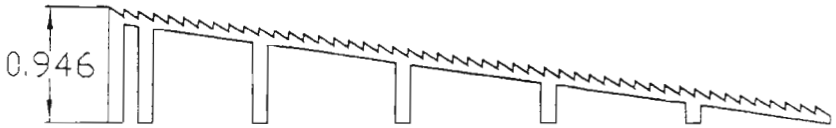
SECTION C

Installation Instructions & Pad Drawings

Manufacturer did not have a specific set of installation instructions for the ABS Wedge. Please note that the Oliver Technologies ABS Plastic Wedge must have full bearing contact with the manufactured home I-beam and the foundation pier.







DIMENSION VERIFICATION ONLY

DESCRIPTION OF CHANGES	DATE

OLIVER TECHNOLOGIES, INC.
P.O. BOX 9
HOHENWALD, TN
PHONE: (931) 796-4555
FAX: (931) 796-8811

TITLE: OLIVER TECHNOLOGIES, INC.
ABS PLASTIC WEDGE

MODEL: ABS PLASTIC WEDGE

DATE: 04/12/00

SCALE: NONE

DRAWING NUMBER:
ABS-PW

PRODUCT TESTING, INC.
111 SPRING STREET
JACKSONVILLE, FLORIDA 32254
PHONE (904) 781-9153 FAX (904) 781-9154

SECTION D

Materials Used in Setup

Steel I-Beam 4" in height x 2.5" Bearing Width
Cap block 4"x4"x16"
Dial Gauge with 2" Travel - Readings to 0.001"
Swivel Loading Head

Vertical Load Test Procedure

The Oliver Technologies ABS Plastic Wedge was placed on a 4"x4"x16" cap block. A steel I-beam was placed on the wedge directly on top of the upper wedge. A load was applied to the I-beam and deflection measurements were taken at five hundred (500) pound increments.

A pre-load of 1,000 pounds was applied to the wedge and the dial gauge was zeroed. The load was increased until nine thousand (9,000) pounds was applied.

The Oliver Technologies ABS Plastic Wedge was loaded by a Tinius Olsen testing machine, S/N 95800, which was calibrated February 14, 2000 and found to be $\pm 0.5\%$. The testing machine speed was set at approximately 0.035 inches per minute and the temperature range for the test conducted was 73 to 74 degrees Fahrenheit. The Oliver Technologies ABS Plastic Wedges were stored at a room temperature of 70 to 80 degrees Fahrenheit for a minimum of 40 hours prior to the testing.

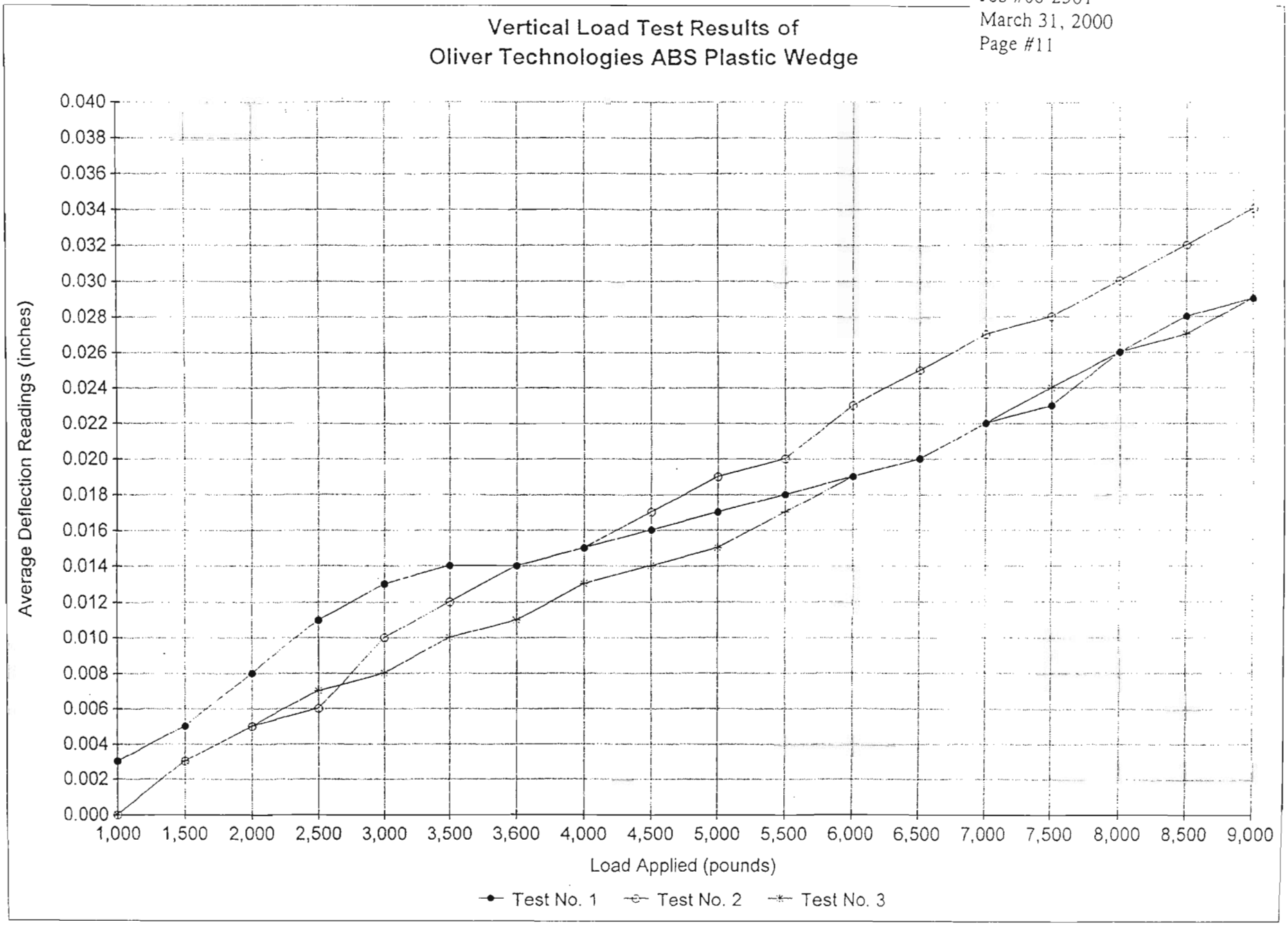
SECTION E

Load vs Deflection Test Results

Load (in pounds)	Deflection (in inches)		
	Test No. 1	Test No. 2	Test No. 3
1,000	0.003	0.000	0.000
1,500	0.005	0.003	0.003
2,000	0.008	0.005	0.005
2,500	0.011	0.006	0.007
3,000	0.013	0.010	0.008
3,500	0.014	0.012	0.010
3,600	0.014	0.014	0.011
4,000	0.015	0.015	0.013
4,500	0.016	0.017	0.014
5,000	0.017	0.019	0.015
5,500	0.018	0.020	0.017
6,000	0.019	0.023	0.019
6,500	0.020	0.025	0.020
7,000	0.022	0.027	0.022
7,500	0.023	0.028	0.024
8,000	0.026	0.030	0.026
8,500	0.028	0.032	0.027
9,000	0.029	0.034	0.029

SECTION E - Continued

Graph of Load Test Results


Vertical Load Test Results of
Oliver Technologies ABS Plastic Wedge
Average Deflection Readings (inches)
0.040
0.038
0.036
0.034
0.032
0.030
0.028
0.026
0.024
0.022
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
1,000
1,500
2,000
2,500
3,000
3,500
3,600
4,000
4,500
5,000
5,500
6,000
6,500
7,000
7,500
8,000
8,500
9,000
Load Applied (pounds)
Test No. 1
Test No. 2
Test No. 3

SECTION F

Copy of State of Florida Vertical Procedure

V. Testing Procedure for Vertical Load Test

1. The "DEWEDGE" mobile home plastic leveling shim wedge for testing purposes shall be a randomly selected sample.

2. Shims shall be placed on a 2 x 8 x 16" pressure treated wood or on a 4" x 8" x 16" solid cap block. The 4" high steel I-beam x 2-1/2" wide shall be placed perpendicular to the long dimension of the shim and wood or cap block (Amended 12/1/99).

3. Shims shall be pre-loaded at a 1,000 pounds minimum, then a load shall be applied to the I-beam at 500 pound increments and deflection measurements taken until a service design load of 3,600 pounds is obtained or a deformation limit of .04" is reached. The load shall be increased 2.5 times as a safety factor to obtain an ultimate load of 9,000 pounds without failure (Amended 12/1/99).

4. Three (3) consecutive tests shall be performed without failure.

5. A test report of the results shall be submitted which conforms to the established rules per Sections 15C-1.01105 (7) and 15C-1.0108 (7), Florida Administrative Code.

NOTE: Amended 12/1/99 - Bearing area is based on a 2-1/2" width x 3" length. Service load is based on allowable stress of 425 psi perpendicular to grain loading with a 1.13 multiplier. Source: ATTC Timber

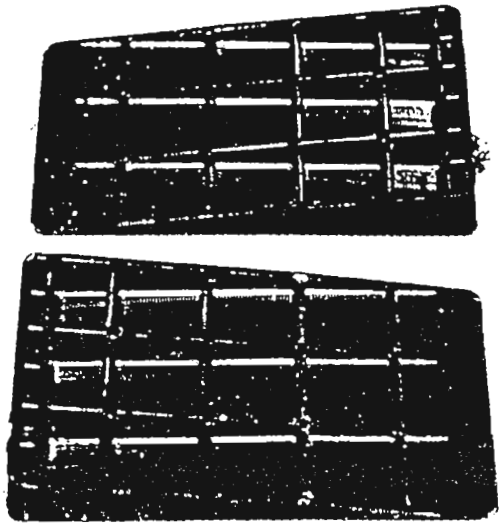
SECTION G

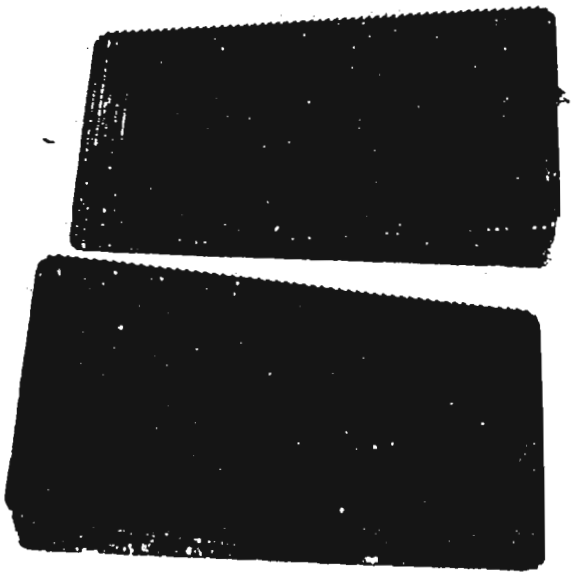
Photograph Descriptions

Item	Description
A	Top: View of top of Oliver Technologies ABS Plastic Wedge Bottom: View of the bottom of the ABS Plastic Wedge
B	Center: Close up view showing the saw tooth design on top of wedge
C	Top: Close up view of the test set up Bottom: View of wedges after testing, with bottom three having some slight markings from concrete cap block.

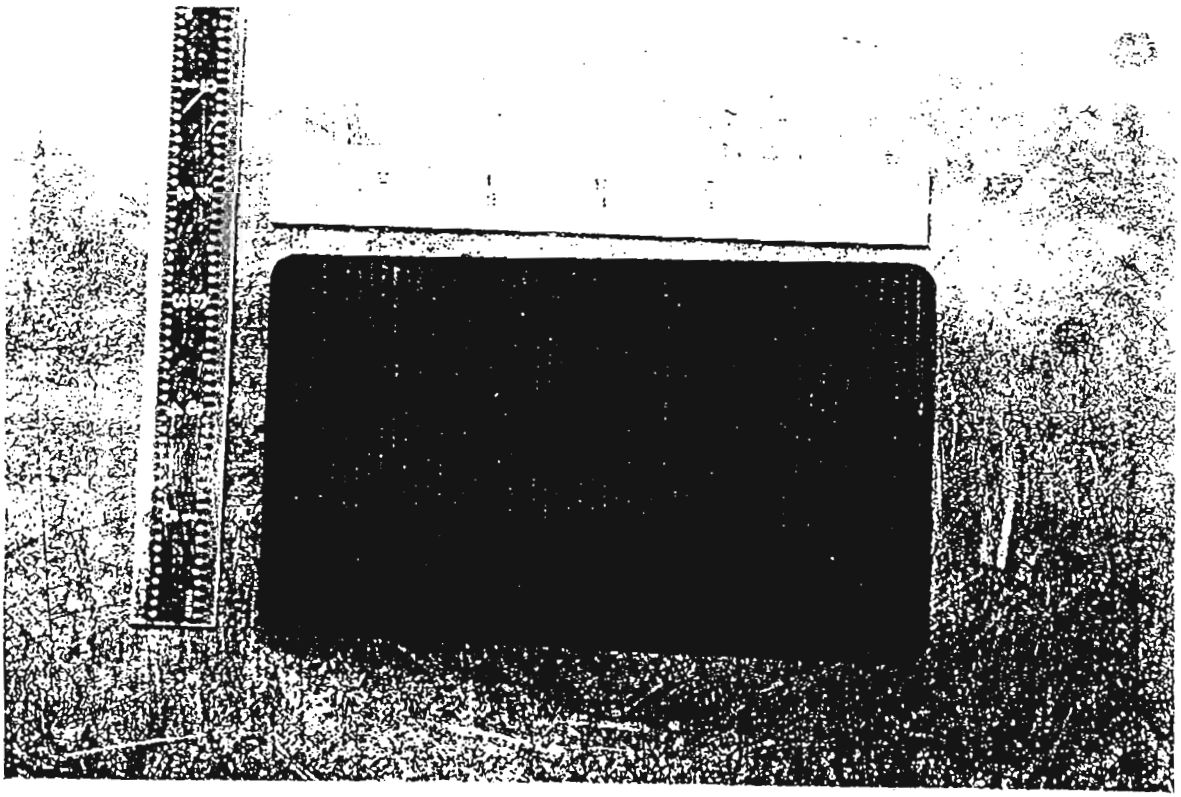
SECTION H

Photographs

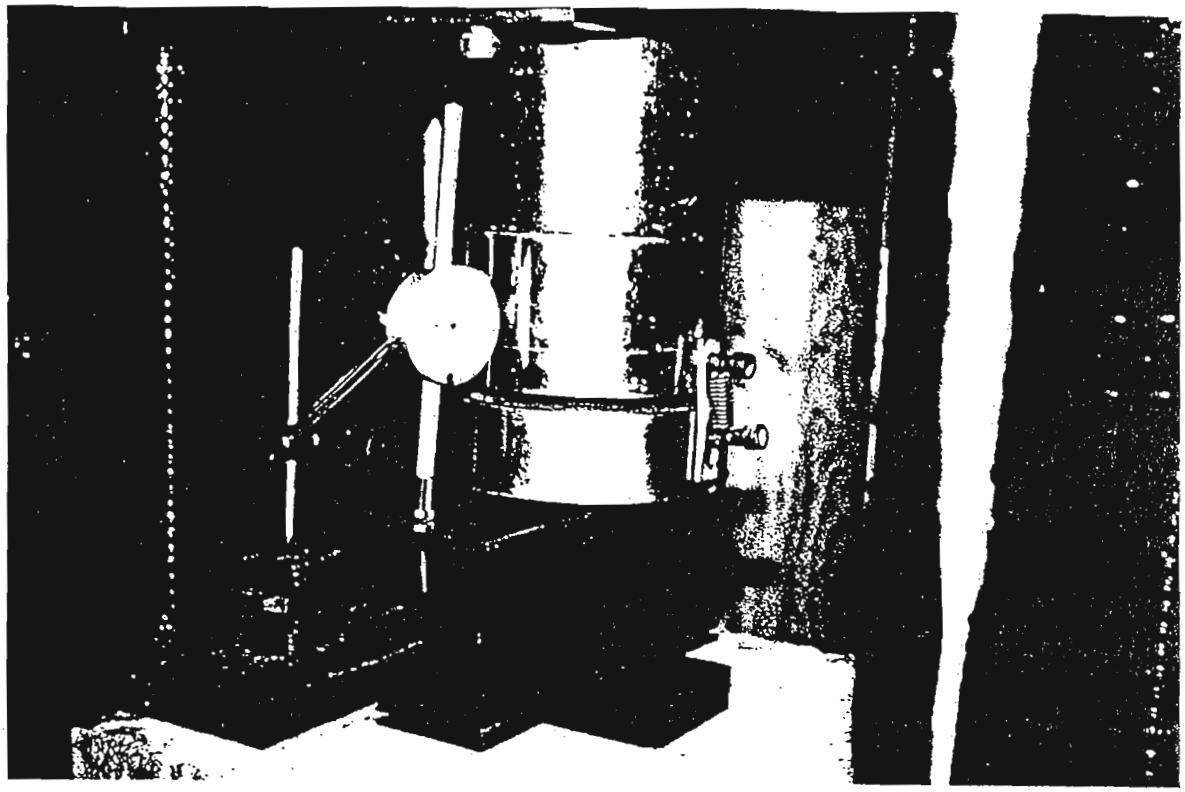


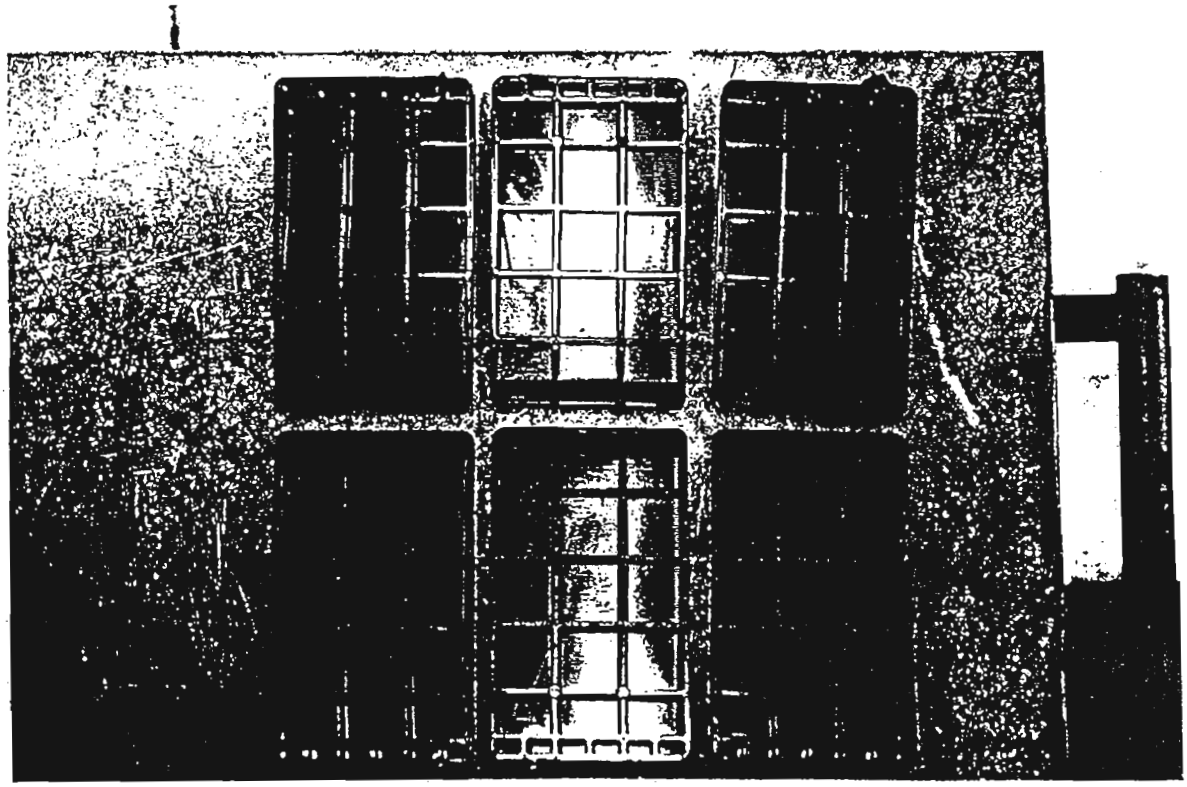


Product Testing, Inc. P.O. Box 37634 Jacksonville, Florida 32236-7634 PH: (904) 384-8150		Item A



Product Testing, Inc. P.O. Box 37634 Jacksonville, Florida 32236-7634 PH: (904) 384-8150		Item B





Product Testing, Inc.
P.O. Box 37634
Jacksonville, Florida 32236-7634
PH: (904) 384-8150

Item C

Manufactured Housing Fdn Systems
a division of Oliver Technologies, Inc.
467 Swan Avenue
Hohenwald, TN 38462
PH: 1-800-284-7437

INSTALLATION INSTRUCTIONS FOR OLIVER TECHNOLOGIES, INC. ABS WEDGE SHIM, P/N 2410

1. Build pier to manufacturers instructions and state and local ordinances.

2. The Oliver Technologies, Inc. (OTI) ABS Wedge Shim has a 1/4" minimum height and 1 ½" maximum height, with a working load of 3,600 pounds.

   Refer to home manufacturer's setup manual to determine pier loading based on pier spacing used. Divide pier load by 3600# / shim to determine the number of shims required per pier. Fractions must be rounded up to the next whole number.

   Example:
   Wt. / Foot / Frame Member - 600 lbs / ft
   Pier Spacing - 8'
   Load = 600 lbs / ft x 8 ft = 4800 lbs
   4800 lbs / 3600 lbs / shim = 1.33 shims

   Result: Use two (2) shims per pier

3. Center the OTI ABS wedge shims in the center of pier and perpendicular to I-beam main frame.

4. The OTI ABS wedge shim was a saw tooth design that mates together as a locking mechanism. The waffle design contacts the I-beam main frame and the top of the completed pier.

5. Drive the OTI ABS wedge shims tight from both sides of the I-beam main frame with a hammer.