

PERFORMANCE TEST REPORT

Rendered to:

SIMTEK FENCE

TYPE: *SimTek* Privacy Fence System

Report No: 72820.02-119-18
Report Date: 12/13/07

PERFORMANCE TEST REPORT

72820.02-119-18
December 13, 2007

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PERFORMANCE TEST REPORT

Rendered to:

SIMTEK FENCE
1301 West 400 North
Orem, Utah 84057

Report No: 72820.02-119-18
Test Dates: 05/31/07
Through: 10/30/07
Report Date: 12/13/07

1.0 General Information

1.1 Product

6 ft by 6 ft *SimTek* Privacy Fence Systems

1.2 Project Description

Architectural Testing, Inc. was contracted by SimTek Fence to perform dynamic wind load tests on their 6 ft by 6 ft privacy fence systems. This report includes comprehensive written and photographic documentation of the testing performed.

2.0 Wind Load Testing

2.1 Test Specimen

Three (3) fence sections measuring approximately 6 ft wide by 6 ft tall and three (3) 102" posts were tested. SimTek Fence provided all test materials to Architectural Testing, Inc. See drawings in Appendix A for detailed descriptions of assembly and components.

2.2 Equipment

The wind generator consists of an engine driven vane axial fan. The fan blades were fixed at a 5-1/2° pitch as marked on the fan. The plenum has an outlet of 8 ft wide by 4 ft high with eight 2 ft by 2 ft baffled outlets. Deflections were measured with linear transducers accurate to 0.01". Wind speeds were calibrated according to Section 7 of Miami-Dade's Protocol TAS 100-95 (reference Architectural Testing, Inc. Report No. 72064.02-119-16).

2.3 Test Setup

Wind Loading on Panels

A steel test fixture was designed and fabricated to simulate a rigid post embedment. The bottom of the bottom rail was positioned 1" above the top of the test fixture. An additional panel section was added and anchored to the ground to simulate field installation conditions. The wind generator outlet was located 4 ft from the face of the specimen (see photographs in Appendix B). Linear transducers were fixed on the top rail, middle of the in-fill area, and bottom rail for deflection measurements.

Wind Loading on Post

A steel test fixture was designed and fabricated to simulate a rigid post embedment. The post was positioned in the center of the fixture and connected to one panel section with threaded rods. The wind generator outlet was located 4 ft from the face of the specimen (see photographs in Appendix B). Linear transducers were fixed on the top rail, middle of the in-fill area, and bottom rail for deflection measurements.

2.4 Test Procedure

Panel and Post Testing Procedure

Wind load testing was performed at 75 mph and held for duration of 50 seconds followed by a relaxation period of one to two minutes. Following the relaxation period the fence was subjected to a wind load of 110 mph for 35 seconds or until failure. Duration of wind load at each increment was determined by using the following equation:

$$t = 3600 / V_{fm} \quad (\text{Equation 1})$$

where:

t = duration, seconds, and

V_{fm} = "fastest mile" wind speed, mph.

Wind speeds used in testing correlate with "fastest mile" wind speeds (V_{fm}) for reference to codes and design standards. Maximum deflections were recorded at each load level. Three (3) panel specimens and three (3) post specimens were tested using this sequence of loading.

2.5 Limitations of Test

Test setup and procedure provides information for evaluation of the fence assembly to resist sustained wind speeds indicated in the test results. This evaluation includes the transfer of wind loads to the fence panels, rails, and support posts.

2.6 Wind Load Panel Test Results

See drawings in Appendix A for assembly details and photographs in Appendix B for specimen orientation respective to wind direction.

Specimen Description: 6 ft x 6 ft *SimTek* Privacy Fence System

Grade to Bottom Rail Height: 1"

Rails: Two 18 gauge by 1-1/2" by 70-1/4" long rectangular galvanized stiffeners

Panels: One 71-3/4" by 69-1/2" Linear Low Density Polyethylene Shell (LLDPE)

Post: Two 5" by 5" in-line "I" shaped-LLDPE shell with polyethylene foam core with 18 gauge galvanized reinforcing "Z" insert and one 5" by 5" end post with LLDPE shell and polyethylene foam core with 16 gauge galvanized reinforcing "C" insert.

Rail Attachment: The panel was attached through the grooved channels on the post. No fasteners were used to secure the panels. The brackets were attached to the composite posts using three #10 by 2-1/2" stainless steel screws.

Specimen #1
Test Date: 5/31/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	2.17	3.32	0.58
0 mph	Permanent set	1.11	0.94	0.27
110 mph	35 sec	2.24	3.72	1.18
0 mph	Permanent set	2.03	1.59	0.39

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

2.6 Wind Load Panel Test Results: (Continued)

Specimen #2 Test Date: 05/31/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	1.92	3.32	0.57
0 mph	Permanent set	--	--	0.22
110 mph	35 sec	--	--	0.76
0 mph	Permanent set	--	--	0.13

-- Indicates no data point recorded

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

Specimen #3 Test Date: 05/31/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	--	4.57	0.64
0 mph	Permanent set	--	1.09	0.19
110 mph	35 sec	--	10.05	1.40
0 mph	Permanent set	--	--	--

-- Indicates no data point recorded.

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

2.7 Wind Load Post Test Results

See drawings in Appendix A for assembly details and photographs in Appendix B for specimen orientation respective to wind direction.

Specimen Description: 6 ft x 6 ft *SimTek* Privacy Fence System

Grade to Bottom Rail Height: 1"

Rails: Two 18 gauge by 1-1/2" by 70-1/4" long rectangular galvanized stiffeners

Panels: One 71-3/4" by 69-1/2" Linear Low Density Polyethylene Shell (LLDPE)

Post: One 5" by 5" in-line "I" shaped-LLDPE shell with polyethylene foam core with 18 gauge (0.54 minimum thickness) galvanized reinforcing "Z" insert made with HSLAS (high strength, low alloy steel) Grade 60, Class 2.

Post Attachment: The post was attached to the center of the panel with threaded rods and anchored to the test fixture with steel angles.

Specimen #1 Test Date: 10/29/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	--	--	--
0 mph	Permanent set	--	--	--
110 mph	35 sec	--	--	--
0 mph	Permanent set	--	--	--

-- Indicates no data point recorded.

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

Specimen #2 Test Date: 10/30/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	2.17	1.19	0.27
0 mph	Permanent set	0.58	0.38	0.15
110 mph	35 sec	5.89	3.21	0.74
0 mph	Permanent set	1.38	0.83	0.32

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

2.7 Wind Load Post Test Results: (Continued)

Specimen #3
Test Date: 10/30/07

Wind Speed	Duration	Maximum Deflection (inches)		
		Top	Mid	Bottom
75 mph	50 sec	1.59	0.89	0.23
0 mph	Permanent set	0.46	0.31	0.16
110 mph	35 sec	4.98	2.73	0.68
0 mph	Permanent set	1.35	0.82	0.33

Maximum Sustained Wind, $V_{fm} = 110$ mph (equivalent $V_{3s} = 130$ mph)

2.8 Summary and Conclusions

The tested samples of *SimTek* Privacy Fence withstood a 110 mph sustained wind corresponding to "fastest mile wind speed", V_{fm} . Equivalent 3-second gust wind speed (V_{3s}) is 130 mph.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this test report, and all other supporting evidence will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, said materials shall be discarded without notice, and the service life of this report by Architectural Testing, Inc. shall expire. Results obtained are tested values and were secured using the designated test methods. This report neither constitutes certification of this product nor expresses an opinion or endorsement by this laboratory; it is the exclusive property of the client so named herein and relates only to the tested specimens. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:

Matthew C. Holloway
Technician

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Project Engineer

MCH:mch/alb

Attachments (pages)

Appendix A - Drawings (6)

Appendix B - Photographs (3)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	12/13/07	N/A	Original report issue

APPENDIX A

Drawings

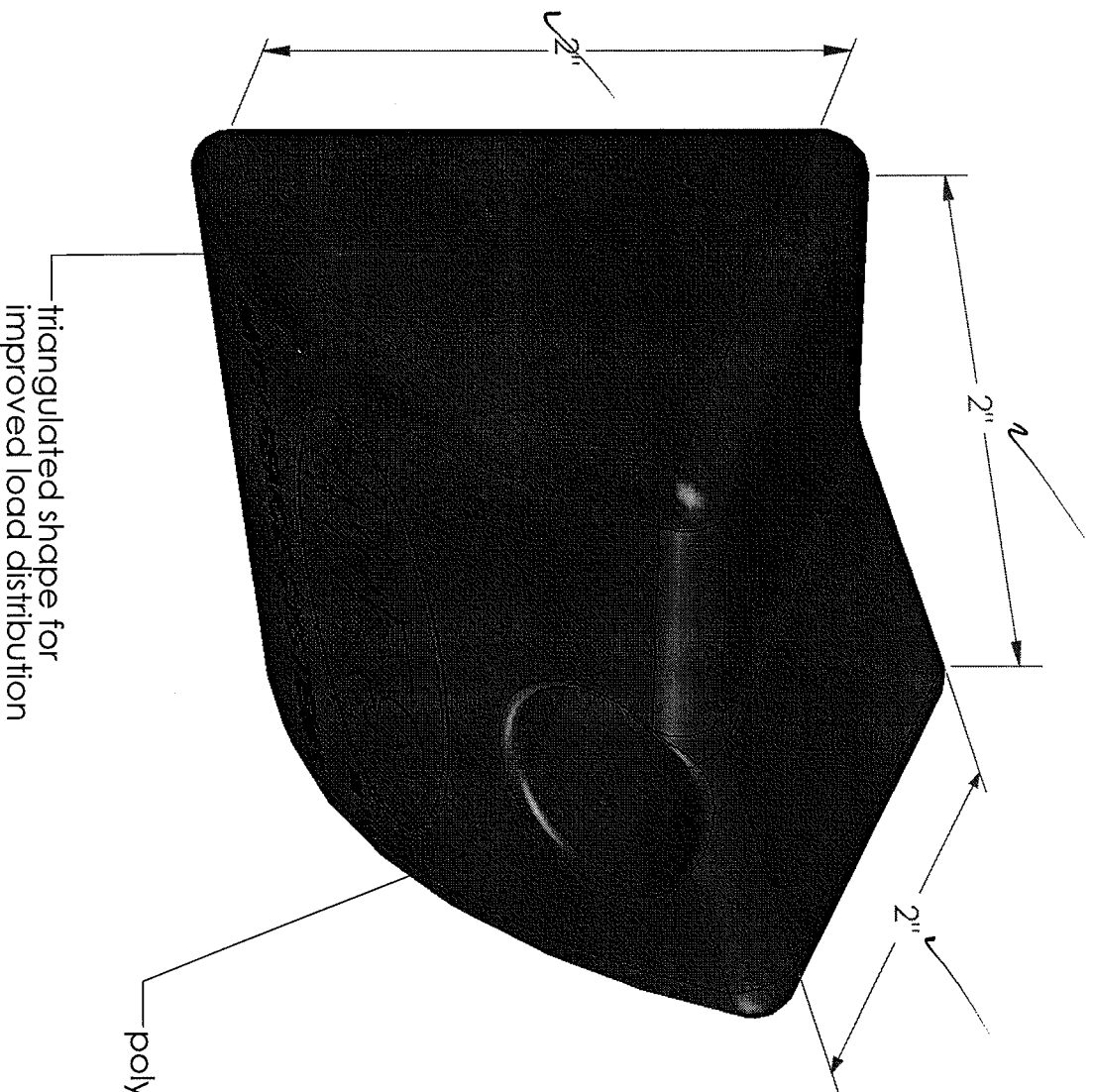
OASIS™ SPECIFICATIONS: POST BRACKET



Architectural Testing

Test sample complies with these details.
Deviations are noted.

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Date 9/5/07 Tech MPE



- brackets must be used under both sides of every panel
- the top of the bracket should be about 73 1/2" below the top of the post
- the posts and brackets are to be installed such that each panel is level
- use specified fasteners to ensure proper engagement with post stiffeners

OASISTM SPECIFICATIONS:

END-POST



Test sample complies with these details.
Deviations are noted.

Report#

72820.01-119-18

Date

9/5/12

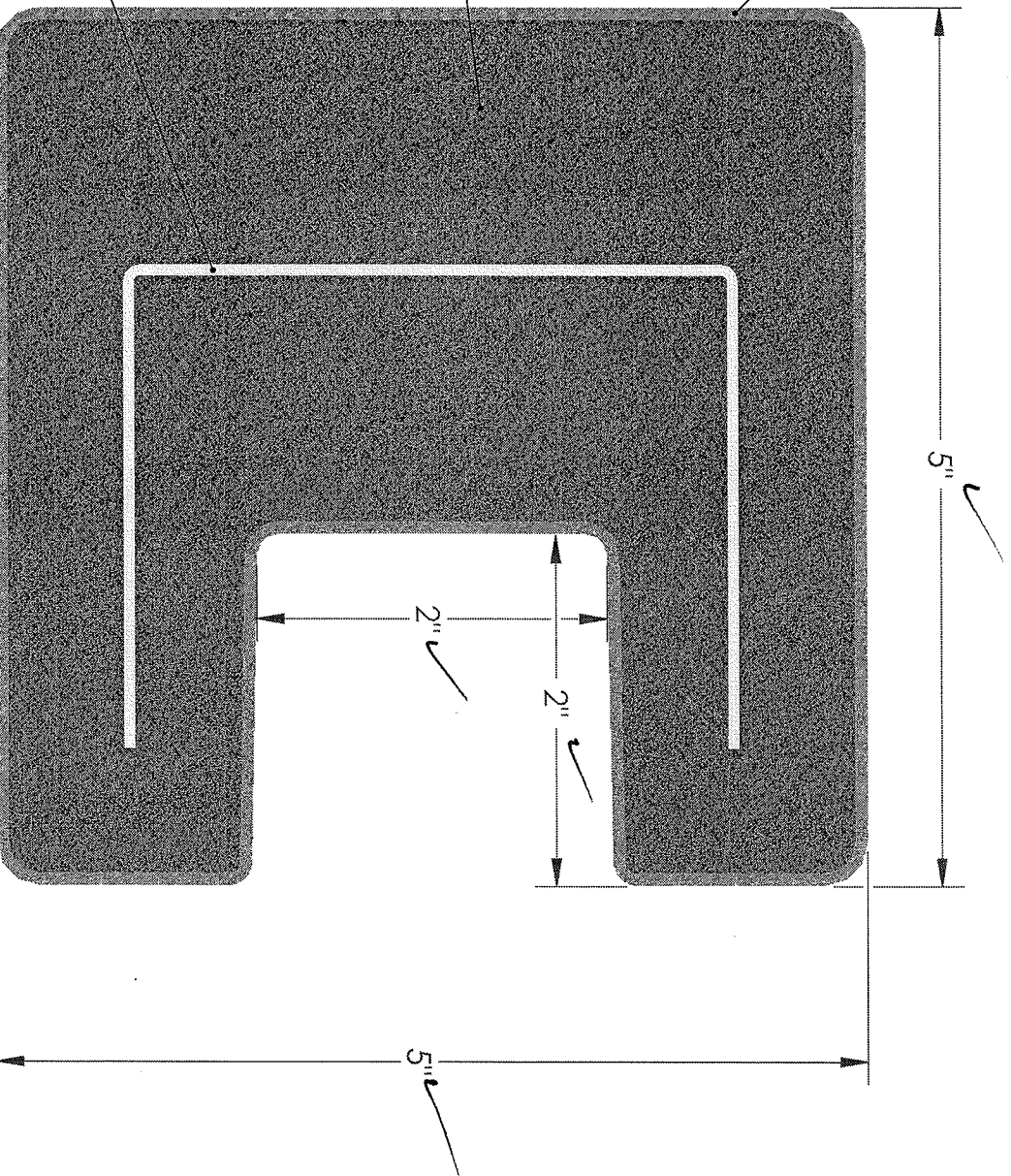
Test

MBE

linear low density
polyethylene (LLDPE) shell

rigid polyethylene
foam core

16 gauge galvanized
reinforcement



Total weight approximately 30 lbs.

OASIS™ SPECIFICATIONS:

LINE-POST

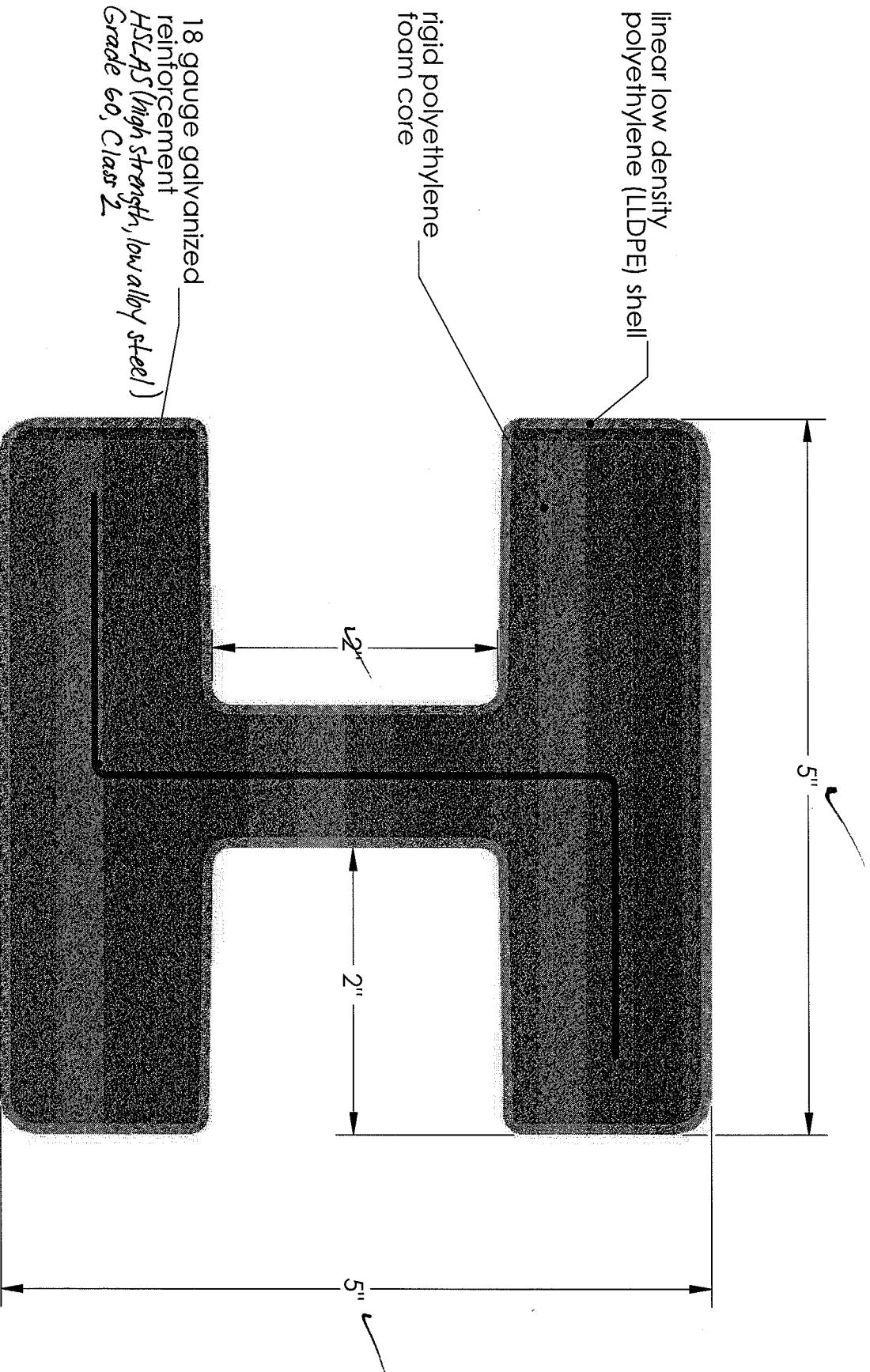


Architectural Testing

Test sample complies with these details.
Deviations are noted.

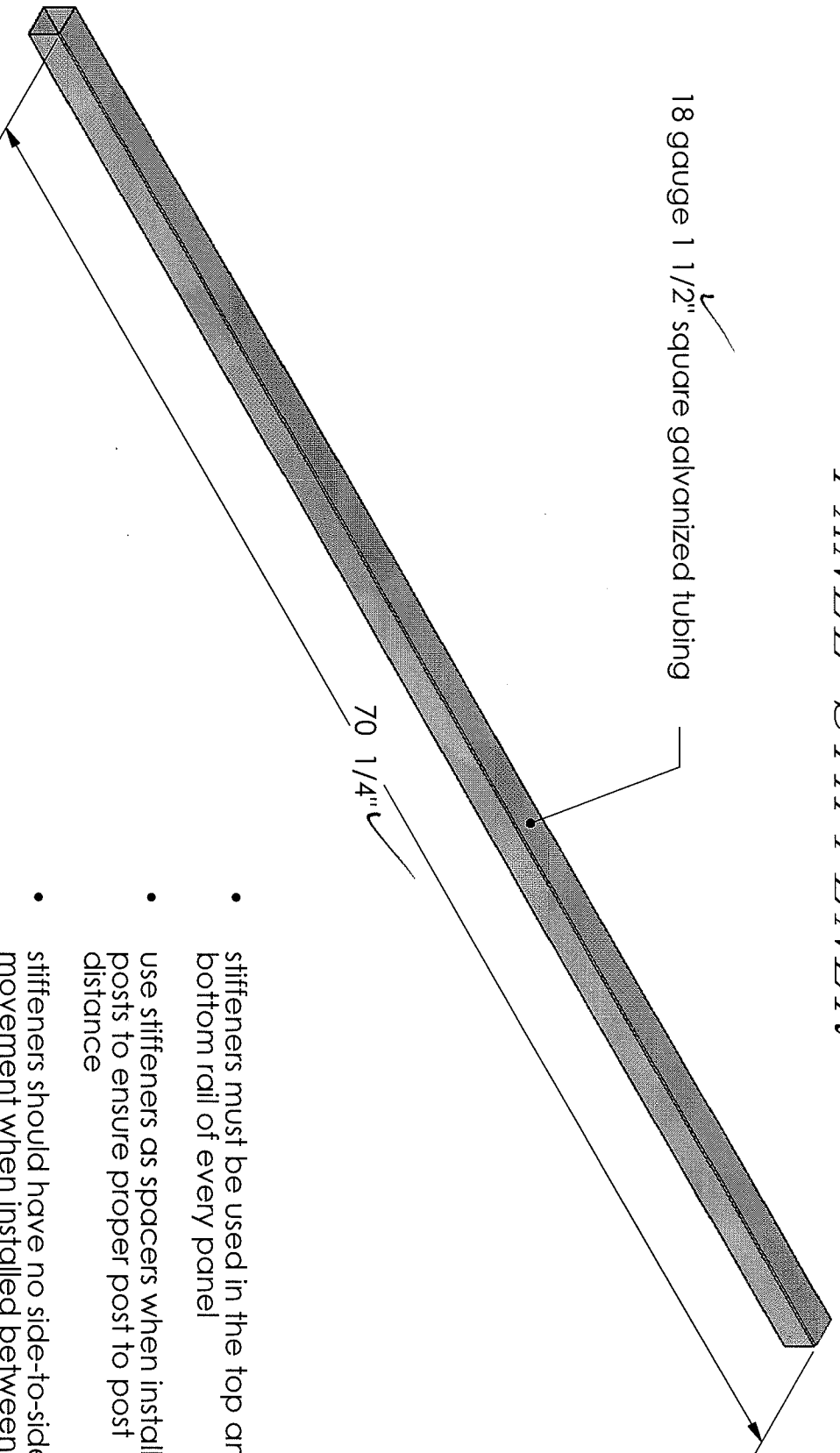
Report# 32820.01-119-18

Date 9/5/03 Tech MDE



OASIS™ SPECIFICATIONS:

PANEL STIFFENER



- stiffeners must be used in the top and bottom rail of every panel
- use stiffeners as spacers when installing posts to ensure proper post to post distance
- stiffeners should have no side-to-side movement when installed between posts
- stiffeners may be cut, but should remain slightly wider than the panels to allow for thermal expansion



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report#

72-820.01-119-18

Date

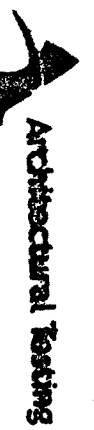
9/5/07

Test

MDP

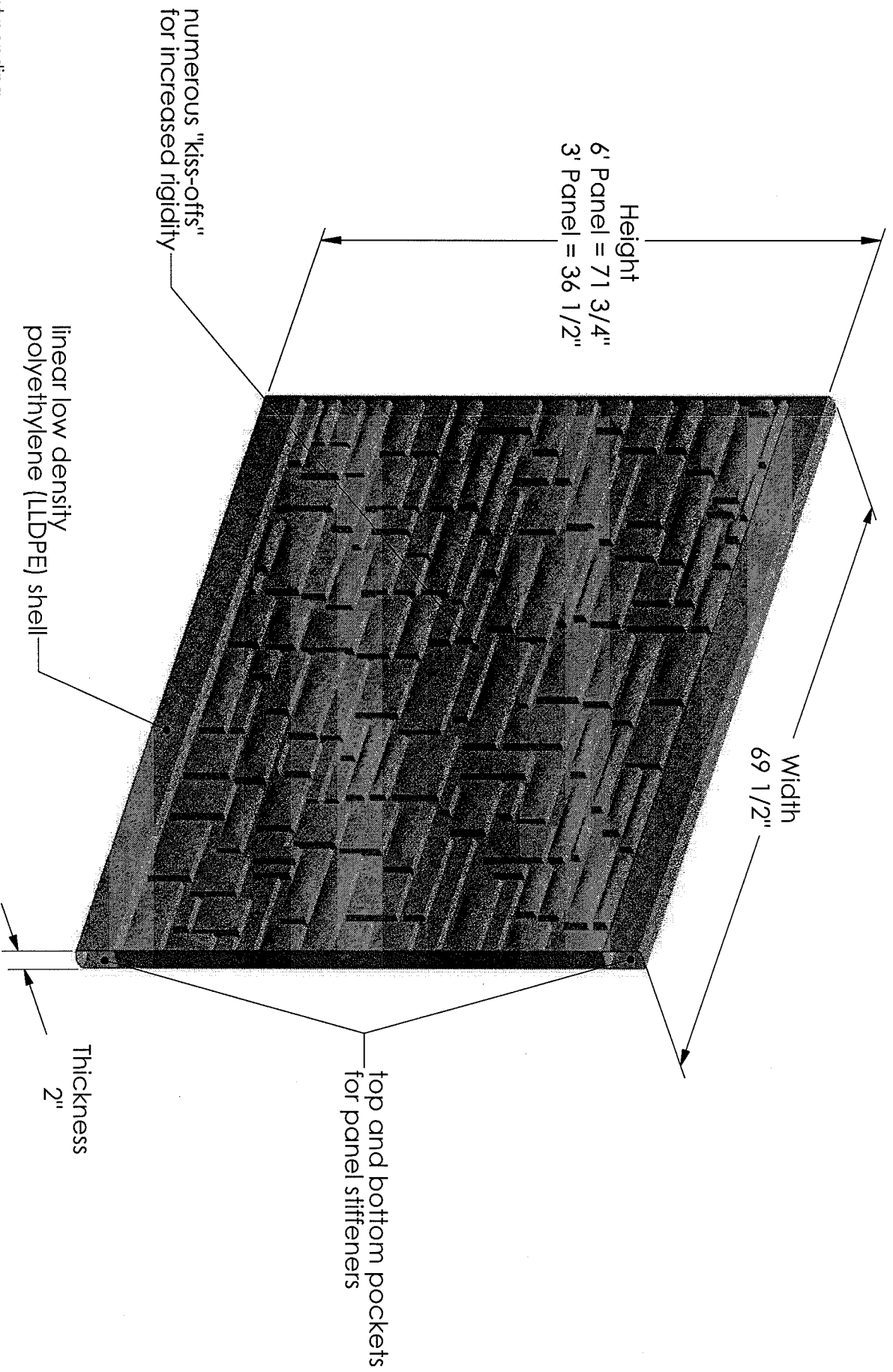
OASISTM SPECIFICATIONS:

Panels



Test sample complies with these details.
Deviations are noted.

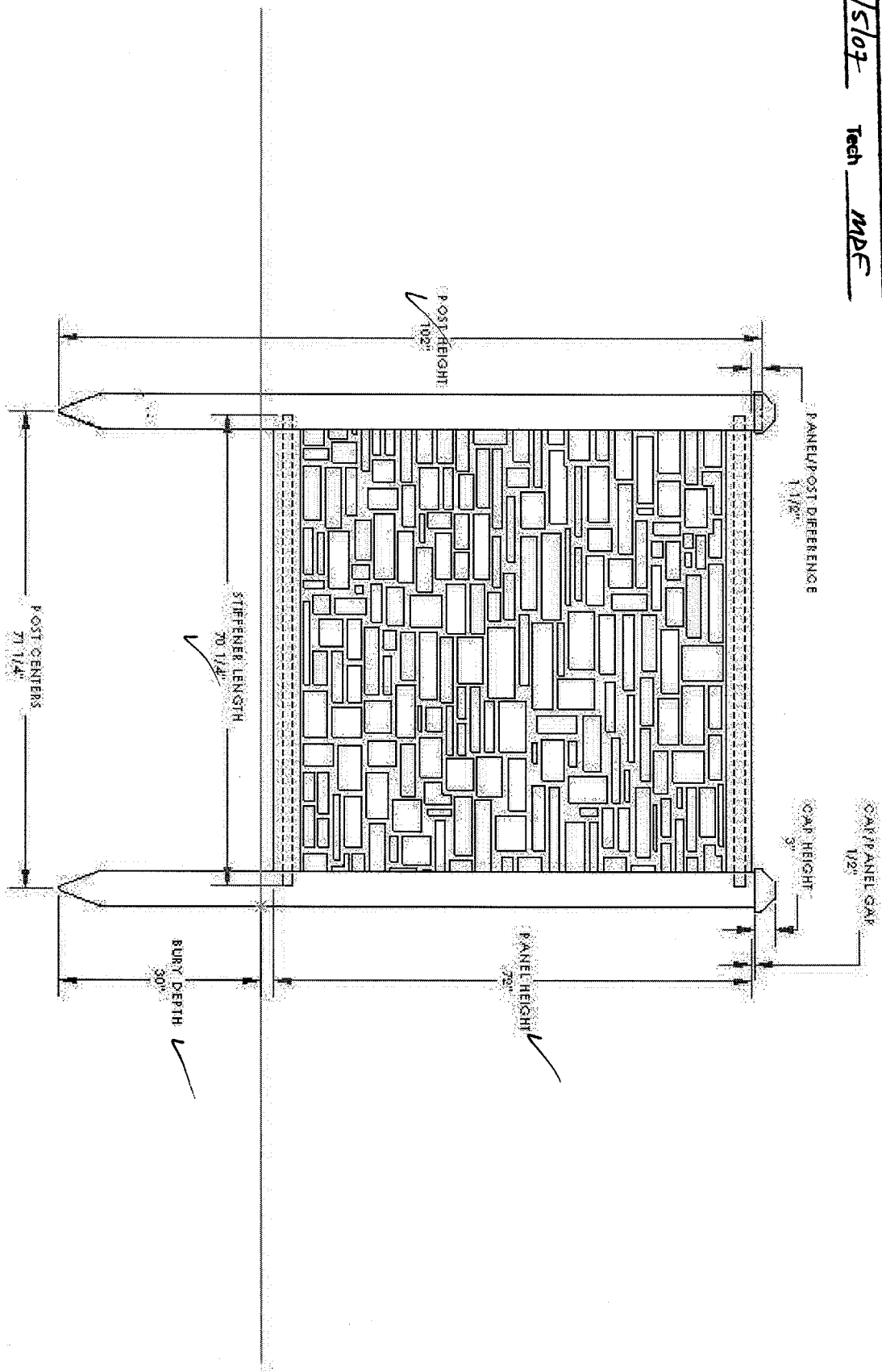
Report# 72820.01-119-18
Date 9/5/07 Tech MBE



Test sample complies with these details.
Deviations are noted.

Report# 72820.01-119-1P

Date 9/5/07 Tech MPF



APPENDIX B

Photographs



Photo No. 1
Wind Load Panel Test Setup



Photo No. 2
Specimen #1 - at 110 mph Wind Speed



Photo No. 3
Specimen #2 during Wind Load Panel Test



Photo No. 4
Wind Load Post Setup



Photo No. 5
Specimen during Testing of Post



Photo No. 6
Specimen during Testing of Post