Architectural Testing

TEST REPORT

Rendered to:

USA VINYL, LLC

For:

***Savannah* and *Pembroke* Privacy Fence Systems**

Report No: 82343.01-119-16
Report Date: 05/28/08

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

TEST REPORT

82343.01-119-16
May 28, 2008

TABLE OF CONTENTS

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Rendered to:

USA VINYL, LLC
3830 Lacon Road
Hilliard, Ohio 43026

Report No: 82343.01-119-16
Test Date: 05/08/08
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1.0 General Information

1.1 Product

6 ft High by 8 ft Wide *Savannah* and *Pembroke* Privacy Fence Systems

1.2 Project Description

Architectural Testing, Inc. was contracted by USA Vinyl, LLC to perform dynamic wind load tests on their 6 ft high by 8 ft wide *Savannah* and *Pembroke* privacy fence systems. This report includes comprehensive written and photographic documentation of the testing performed.

1.3 Test Witnessing

Mr. Jerry Sexton, a representative of USA Vinyl, LLC, witnessed all testing reported herein.

2.0 Reference Standard

2004 *Florida Building Code, Building*

3.0 Dynamic Wind Load Testing

3.1 Test Specimen

Two *Savannah* and two *Pembroke* fence sections measuring 6 ft high by 8 ft wide were tested. USA Vinyl, LLC provided all test materials. Architectural Testing, Inc. personnel assembled all test specimens at Architectural Testing, Inc. See drawings in Appendix A for detailed descriptions of assemblies and components.

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3.2 Test 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 displacement transducers accurate to 0.01 in. Wind speeds were calibrated according to Section 7 of Miami-Dade's Protocol TAS 100-95 (reference Architectural Testing, Inc. Report No. 76850.02-119-18).

3.3 Test Setup

A steel test fixture was used to simulate a rigid post embedment. The bottom of the bottom rail was fixed at two inches above the top of the test fixture. The wind generator outlet was located 4 ft from the face of the specimen (see photographs in Appendix B). Linear displacement transducers were located to monitor displacement of the top rail at its center, the middle of the in-fill area and bottom rail at its center.

3.4 Test Procedure

Wind load testing began at 30 mph and increased in 10 mph increments until failure or a maximum wind speed of 110 mph. Wind loads were performed with a relaxation period after 50 mph, 80 mph and 110 mph to record permanent set. The duration of the applied wind load at each wind speed was determined by using the following equation:

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

where:

t = duration, seconds

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. Testing was performed on May 8, 2008.

3.5 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. The posts only support a single section of fence in this simulation and are, therefore, not fully evaluated for actual field conditions. Additional evaluation of the support posts may be required. Posts were braced with 2 x 2 x 3/16 x 54 in steel angles to simulate cement fill to mid-post height.

3.6 Wind Load Test Results

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

Series / Model: *Savannah*
Description: 6 ft high by 8 ft wide PVC privacy fence

Rails: Two 1-1/2 in by 5-1/2 in by 0.085 in wall by 95-3/4 in hollow PVC co-extrusion with two equally-spaced internal horizontal ribs, 7/8 in wide slot for pickets and two notched tabs per side on each rail end.
Top Rail Reinforcement: None
Bottom Rail Reinforcement: 1-1/4 in by 1-5/8 in by 0.065 in wall by 95-3/4 in Aluminum **I** Extrusion.
Pickets: Fifteen tongue & groove 7/8 in by 6 in by 0.059 in average wall by 64-1/4 in hollow PVC co-extrusion with two equally spaced internal ribs.
Picket Attachment: Pickets were inserted into 7/8 in wide slot in rails.
U-Channel: Two 1-1/4 in by 1-1/2 in by 0.09 in wall PVC mono-extrusion slipped over each end picket to conceal tongue or groove.
Post: Two 5 in by 5 in by 0.135 in average wall by 108 in hollow PVC co-extrusion with routings for rails; reinforced with two external steel angles to 54 in height to simulate concrete fill to 54 in.
Rail Attachment: Rails were inserted 1 in into 1-1/2 in by 5-1/2 in routed holes in the posts. The notched tabs on rail ends prevented rail withdrawal.

Test No. 1 - *Savannah* with No Mechanical Fasteners

Wind Speed (mph)	Duration (sec)	Deflection (in)		
		Top	Mid	Bottom
30	120	1.23	1.52	0.94
40	90	2.37	2.62	1.63
50	70	3.86	4.16	2.54
0	120	0.00	0.28	0.22
60	60	5.77	6.01	3.65
70	50	8.34	8.43	4.99
80	45	9.98	9.90	5.99
0	120	0.18	0.48	0.36
90	40	12.73	12.84	7.66
100	6	Blowout of nine center pickets		

Maximum Sustained Wind, V_{fm} = 90 mph (equivalent V_{3s} = 110 mph)

3.6 Wind Load Test Results (Continued)

Series / Model: *Savannah*
Description: 6 ft high by 8 ft wide PVC privacy fence

Rails: Same as Test No. 1
Top Rail Reinforcement: Same as Test No. 1
Bottom Rail Reinforcement: Same as Test No. 1
Pickets: Same as Test No. 1
Picket Attachment: Pickets were inserted into 7/8 in wide slot in rails and each picket end was attached to the rail with a single #10 x 1 in self-tapping Phillips head sheet metal screw installed on the side opposite the wind generator. See photograph in Appendix B.
U-Channel: Same as Test No. 1
Post: Same as Test No. 1
Rail Attachment: Rails were inserted into routed holes in the posts. The notched tabs on rail ends prevented rail withdrawal. Additionally, a single #10 x 1 in self-tapping Phillips head sheet metal screw was inserted into the top of the top rail inside each of the two posts. See photograph in Appendix B.

Test No. 2 - *Savannah* with Pickets Screwed to Rails

Wind Speed (mph)	Duration (sec)	Deflection (in)		
		Top	Mid	Bottom
30	120	1.39	1.47	0.85
40	90	2.17	2.21	1.39
50	70	3.82	3.81	2.33
0	120	0.00	0.16	0.08
60	60	4.98	5.03	3.03
70	50	6.99	6.81	4.37
80	45	8.96	8.69	5.16
0	120	0.11	0.28	0.17
90	40	10.97	10.97	6.77
100	35	13.48	13.11	8.39
110	35	14.46	14.26	9.32
0	120	0.34	0.69	0.69

***Observation**: No visible damage at the completion of the test.*

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

3.6 Wind Load Test Results (Continued)

Series / Model: *Pembroke*
Description: 6 ft high by 8 ft wide PVC privacy fence

Rails: Same as Test No. 1
Top Rail Reinforcement: Same as Test No. 1
Bottom Rail Reinforcement: Same as Test No. 1
Pickets: Eight tongue & groove 7/8 in by 11.3 in by 0.05 in wall by 64-1/4 in hollow PVC co-extrusion with five equally spaced internal ribs and a vertical groove at mid-width on the outside surfaces to simulate a space between two narrower pickets.
Picket Attachment: Same as Test No. 1
U-Channel: Same as Test No. 1
Post: Same as Test No. 1
Rail Attachment: Same as Test No. 1

Test No. 3 - *Pembroke* with No Mechanical Fasteners

Wind Speed (mph)	Duration (sec)	Deflection (in)		
		Top	Mid	Bottom
30	120	1.23	1.52	0.94
40	90	2.37	2.62	1.62
50	70	3.86	4.16	2.54
0	120	0.00	0.28	0.22
60	60	5.77	6.01	3.65
70	50	8.34	8.43	4.99
80	45	9.98	9.90	5.99
0	120	0.18	0.48	0.36
90	40	12.73	12.84	7.66
100	6	Blowout of four center pickets		

Maximum Sustained Wind, V_{fm} = 90 mph (equivalent V_{3s} = 110 mph)

3.6 Wind Load Test Results (Continued)

Series / Model: *Pembroke*
Description: 6 ft high by 8 ft wide PVC privacy fence

Rails: Same as Test No. 1
Top Rail Reinforcement: Same as Test No. 1
Bottom Rail Reinforcement: Same as Test No. 1
Pickets: Same as Test No. 3
Picket Attachment: Pickets were inserted into 7/8 in wide slot in rails and each picket end was attached to the rail with two #10 x 1 inch self-tapping Phillips head sheet metal screws on the side opposite the wind generator. See photograph in Appendix B.
U-Channel: Same as Test No. 1
Post: Same as Test No. 1
Rail Attachment: Same as Test No. 2

Test No. 4 - *Pembroke* with Pickets Screwed to Rails

Wind Speed (mph)	Duration (sec)	Deflection (in)		
		Top	Mid	Bottom
30	120	1.52	1.56	0.96
40	90	2.61	2.67	1.62
50	70	4.32	4.40	2.60
0	120	0.15	0.28	0.22
60	60	5.98	5.99	3.59
70	50	7.78	7.76	4.72
80	45	9.98	10.01	6.02
0	120	0.31	0.45	0.33
90	40	12.03	12.15	7.66
100	35	14.39	14.60	9.50
110	35	16.94	17.21	11.28
0	120	0.63	1.16	1.35

***Observation**: No visible damage at the completion of the test.*

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

4.0 Summary and Conclusions

Wind speed calculations in accordance with ASCE 7-98 / 7-02, *Minimum Design Loads for Buildings and Other Structures*, were used to determine the post load for the fence size (area) supported by the post. The Structure Classification was Category I, Low Hazard, and the Exposure Category was C, Open Terrain. The wind speed calculations use the following equations and coefficients in accordance with ASCE 7:

$$q_z = 0.00256\, K_z K_{zt} K_d V_{3s}^2 I \qquad \text{(Equation 2)}$$

where:

q_z = Velocity Pressure, psf,
K_z = Exposure Coefficient. K_z shall be equal to 0.85 for heights up to 15 ft,
K_{zt} = Topographic Factor. K_{zt} shall be equal to 1.0,
K_d = Directionality Factor. K_d shall be equal to 1.0,
V_{3s} = 3-second gust wind speed, mph,
I = Importance Factor. I shall be equal to 0.87 for a non-hurricane prone regions and hurricane prone regions with V_{3s} = 85 to 100 mph
I = importance factor. I shall be equal to 0.77 for a hurricane prone region with V_{3s} > 100 mph.

***Note #1**: Values do not account for wind speed-up over hills and escarpments.*

$$F = q_z G C_f A_f \qquad \text{(Equation 3)}$$

where:

F = Wind Force,
q_z = velocity pressure, psf,
G = Gust Effect Factor. G shall be equal to 0.85 for rigid structures,
C_f = Net Force Coefficient. C_f shall be equal to 1.2 for free-standing walls,
A_f = Projected Area, ft ^{2}

The design wind load for a 6 ft high by 8 ft wide fence system was calculated using ASCE 7-02 based on sustained wind speeds of 90 mph and 110 mph, which correlate to 110 mph and 130 mph three-second gust wind speeds, respectively. The results are as follows:

Sustained / 3 Second Gust Wind Velocity (mph)	**Design Load [1] (lb)**
90 / 110	994
110 / 130	1,386

[1] *"F" from Appendix C*

These calculations are contained in Appendix C.

5.0 Closing

Detailed drawings, data sheets, representative samples of test specimens, a copy of this test report 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 such materials shall be discarded without notice and the service life of this report by Architectural Testing will expire. Results obtained are tested values and were secured using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

Digitally Signed by: Keith A. Gurnee

Keith A. Gurnee
Technician
Structural Systems Testing

Digitally Signed by: David H. Forney

David H. Forney, P.E.
Senior Project Engineer
Structural Systems Testing

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DAVID HOWARD FORNEY
ENGINEER No. PE-19553E

DHF:dhf/alb

Attachments (pages): This report is complete only when all attachments listed are included
Appendix A - Drawings (9)
Appendix B - Photographs (4)
Appendix C - Calculations (2)

2008.05.29 11:42:02 -04'00'

Revision Log

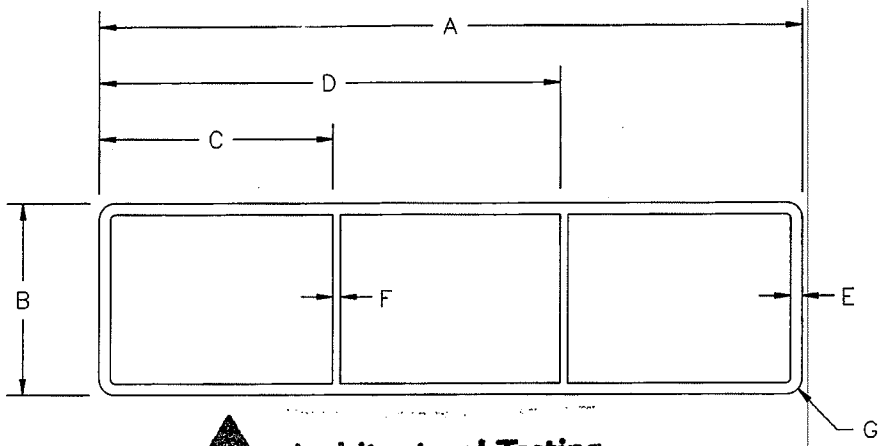
Rev. #	Date	Page(s)	Revision(s)
0	05/28/08	N/A	Original report issue

APPENDIX A

Drawings

UltraGuard®

1 1/2"x5 1/2" RAIL



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 82343.01-119-19

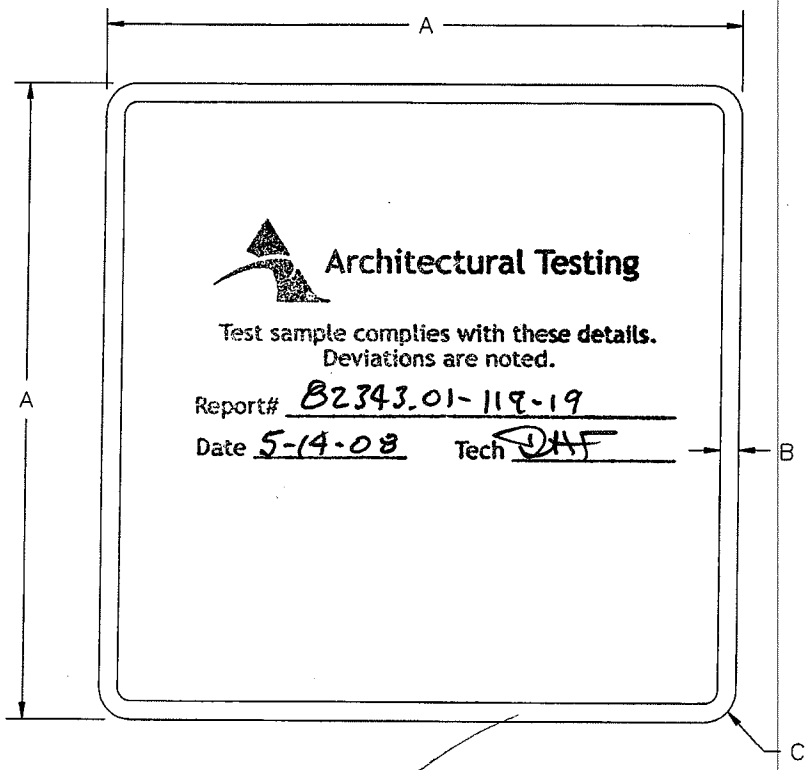
Date 5-14-08 Tech [illegible]

A. WIDTH OUTSIDE = 5.500±0.012
B. WIDTH OUTSIDE = 1.500±0.007
C. OUTSIDE TO FIRST RIB = 1.833 (REFERENCE)
D. OUTSIDE TO SECOND RIB = 3.607 (REFERENCE)
E. NOMINAL WALL THICKNESS = 0.090±0.007
F. NOMINAL RIB THICKNESS = 0.060
G. OUTSIDE CORNER RADIUS = 0.125

WEIGHT PER FOOT - - - = 0.840 LBS.
OVERALL LENGTHS - - - = 6', 8', 12', 16'

UltraGuard®

5"x5" POST



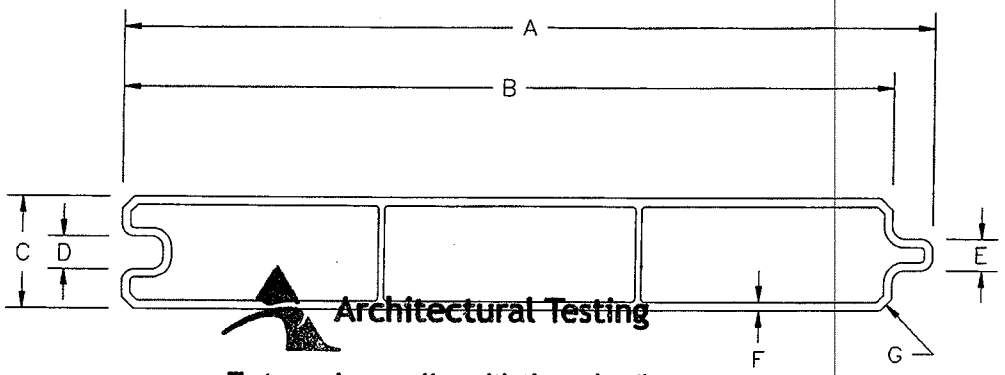
A. WIDTH OUTSIDE = 5.000±0.012
B. NOMINAL WALL THICKNESS = ~~0.145±0.009~~ 0.11 TO 0.145
C. OUTSIDE CORNER RADIUS = 0.250

WEIGHT PER FOOT - - - = 1.700 LBS.
OVERALL LENGTHS - - - = 5.5', 6', 6.5', 7', 7.5', 8', 9', 16'

UltraGuard®

7/8"x6" TONGUE & GROOVE PICKET

SAVANNAH ✓



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 82343-01-119-19

Date 5-14-08 **Tech** DHF

A. OVERALL WIDTH OUTSIDE = 6.312±0.012 ✓
B. INTERLOCKED WIDTH OUTSIDE = 6.000±0.012
C. WIDTH OUTSIDE = 0.875±0.005 ✓
D. GROOVE WIDTH = 0.260±0.005
E. TONGUE WIDTH = 0.240±0.005
F. NOMINAL WALL THICKNESS = ~~0.065±0.005~~ 0.04 TO 0.075 ✓
D. CORNER CHAMFER = 0.093x0.093

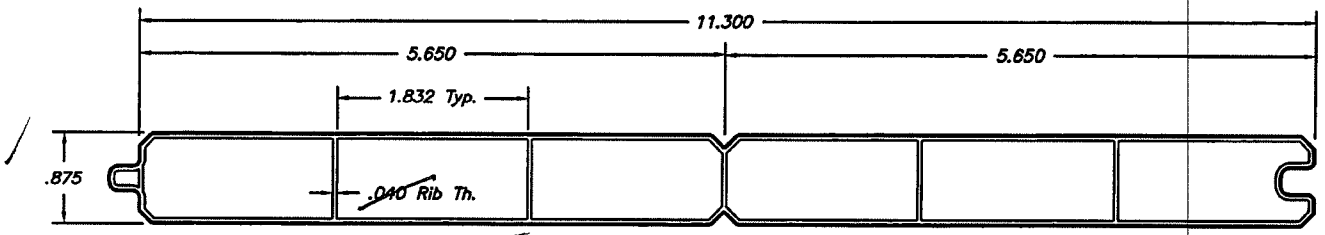
WEIGHT PER FOOT - - - = 0.634 LBS.
OVERALL LENGTHS - - - = 16' (BUNDLED)

PEMBROKE

PART NO. F*43272CX

REV	ECO	BY	DATE	CHK'D
A	14084	PF	5/8/07	

1) Added length



0.03

Architectural Testing

Test sample complies with these details. Deviations are noted.

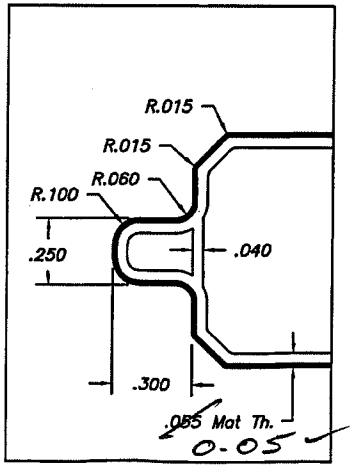
Report# 82343.01-119-19

Date 5-14-08 Tech DJF

Part Number	Length	Tol.
F*43272-2CX	52.00	±.125
F*43272-3CX	64.00	±.125
F*43272-4CX	49.75	±.125
F*43272-5CX	60.0	±.125
F*43272-6CX	62.0	±.125
F*43272-7CX	60.7	±.125
F*43272-8CX	64.25	±.125
F*43272-9CX	60.625	±.125
F*43272-15CX	181.0	±.500
F*43272-16CX	193.0	±.500

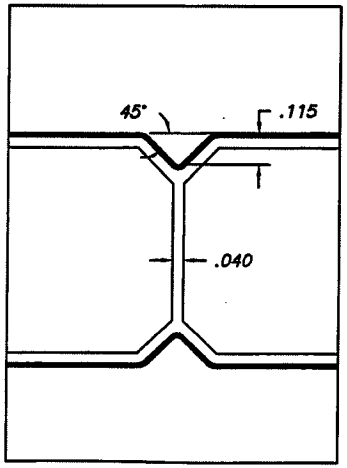
A1

End Detail "A"

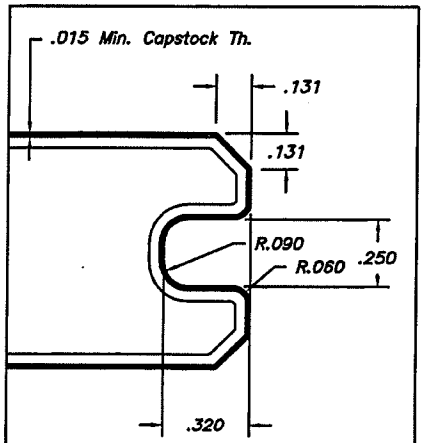


0.05

Center Detail "B"



End Detail "C"



Material:
Capstock – .237 lbs
Substrate – .732 lbs

* INDICATES COLOR DIGIT. REFER TO ROUTING FOR DIGIT CODE AND MATERIAL COLOR.

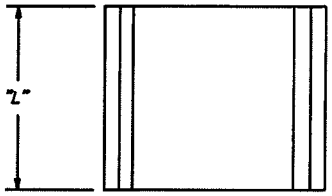
TITLE	Picket, 7/8" x 11.3" Beveled Co-Extruded			
MATERIAL	PVC See Note			Royal Crown Limited
DRAWN PC 8/15/05	ECO	ENG.	DATE	
	A 14084	PF	5/07	
				RELEASE ERO 14080
UNLESS NOTED 1 PLACE ±.060 2 PLACE ±.030 3 PLACE ±.015 4 PLACE ±.010 HOLE SIZE ±.003 ANGLES ±2°				WEIGHT .969 lbs
				PART NO. F*43272CX

DO NOT SCALE FROM PRINT ROUTE

PART NO. F*39108

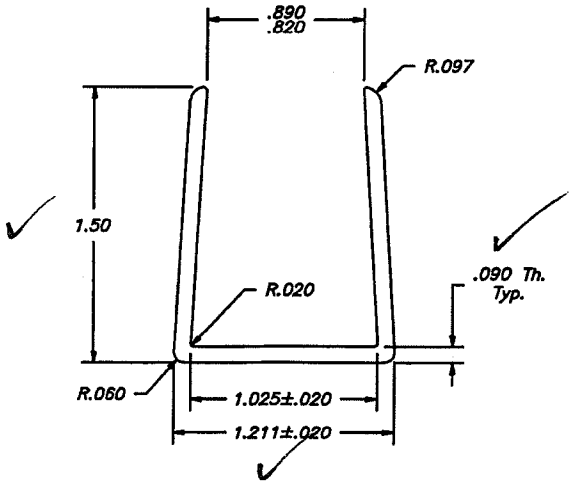
REV	ECO	BY	DATE	CHK'D
H	14084	PF	2/29/08	

1) Added length



	"L"	ECO #
F*39108-1	33.25 +/-.062	12956
-2	45.25 +/-.062	
-3	57.00 +/-.062	14060
-4	91.0 +/-.062	12956
-5	145.0 -0,+.5	
-9	48.5 +.125/-.25	14064
-10	120.0 -0,+.5	14058
-11	46.813 +0/-.062	14020
-12	58.813 +0/-.062	
-13	70.813 +0/-.062	
-17	36.715 +0/-.062	14047
-18	35.497 +0/-.062	
-19	59.000 +0/-.062	
-20	47.497 +0/-.062	
-21	59.497 +0/-.062	
-22	47.000 +0/-.062	
-23	23.497 +0/-.062	
-24	55.0 +0/-.062	
-25	43.0 +0/-.062	
-26	31.0 +0/-.062	
-27	37.688 +0/-.062	
-28	58.750 +0/-.062	
-29	34.813 +0/-.062	14055
-30	3.000 +0/-.062	14055
-31	122.0 +.5/-0	14058
-32	61.0 +.125/-.25	14058
-33	45.0 +0/-.062	14058

H1



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 82343.01-119-19

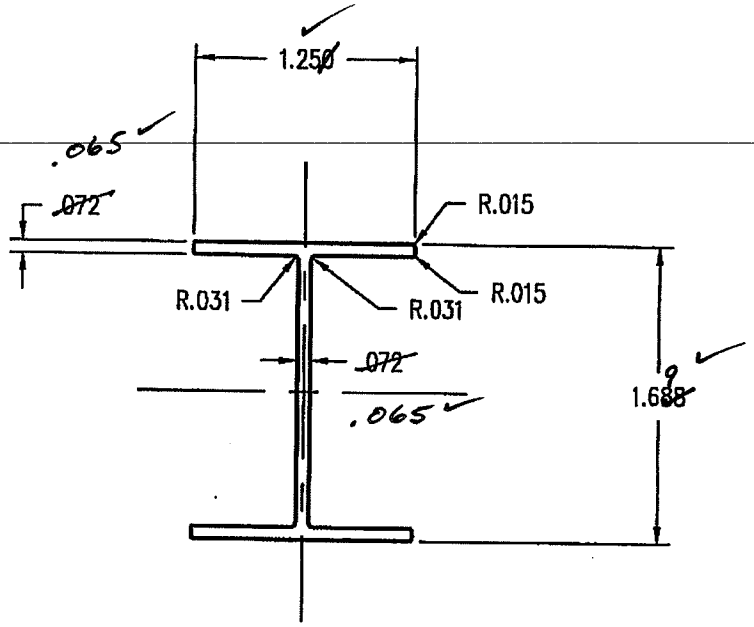
Date 5-14-08 Tech

* INDICATES COLOR DIGIT. REFER TO ROUTING FOR DIGIT CODE AND MATERIAL COLOR.

TITLE	Channel, Privacy Panel "U" 1" WITH 1 1/2 LEGS			
MATERIAL PVC See Note				Royal Crown Limited
DRAWN PC 2/17/97	ECO	ENG.	DATE	
SPEC. NO.	B 13222	PC	5/97	
	C 14020	PC	2/99	
	D 14047	PF	8/02	RELEASE ECO 12838 12/96
	E 14055	PF	3/03	
UNLESS NOTED 1 PLACE ±.060 2 PLACE ±.030 3 PLACE ±.015 4 PLACE ±.010 HOLE SIZE ±.003 ANGLES ±2°	F 14058	PF	11/04	WEIGHT .225 lb/ft.
	G 14060	PF	2/06	PART NO. F*39108
	H 14084	PF	2/08	

DO NOT SCALE FROM PRINT ROUTE

PRO-FAB EXTRUSION DIE#
PS101066



Architectural Testing

ACTUAL SIZE

Test sample complies with these details.
Deviations are noted.

Report# 82343.01-119-19

Date 5-14-08 Tech DHF

NO EXPOSED SURFACES

UNMARKED WALLS: .072
UNMARKED RADII: .031
BREAK SHARP CORNERS: .015 R

REVISIONS

DESCRIPTION: 1.5 X 5.5 STIFFENER

ALUMINUM ASSOC. STD. TOLERANCES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE

DRAWN BY: MJJ		
AREA TOTAL	0.2916	SQ. IN.
WT. PER FOOT	0.3499	LBS.
EXTERIOR PER.	8.1273	IN.
PER. TOTAL		
FACTOR	23	

CIR. CIRCLE: 2

DATE: 4-8-08

ALLOY & TEMPER: 6063-T5

DIE SIZE:

HOLES: BAK.:

PRESS: 7" BOL.:

DIE VEND.: FDR.:

CUSTOMER: OPEN STOCK

CITY: PFE STATE:

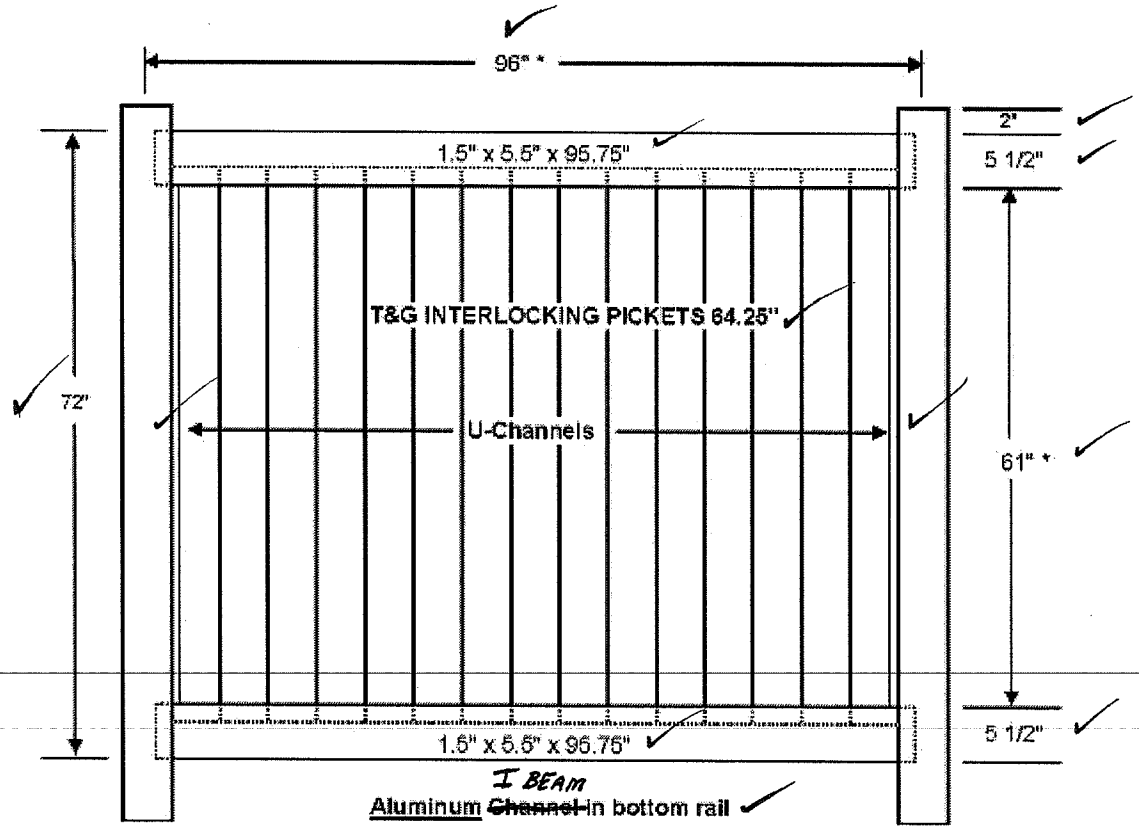
DIE NO.: PS101066 (also P1184S) CUST. DWG. #:

SCALE: FULL DATE: 4-8-08

SOLID SEMI-HOLLOW HOLLOW SPECIAL

PRO-FAB EXTRUSION LLC

Pro-Fab Extrusion, LLC
2415 Wilson Avenue Campbell, Ohio 44405
Mail To: 9368 Massillon Road Dundee, Ohio 44624
Phone: 1-800-872-2539 330-755-4200 Fax: 330-755-9316



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# 82343.01-119-19

Date 5-12-08 Tech DHF

General Post Installation - continued

Important - When installing your fence we recommend that a minimum of 1.5" clearance between the bottom of the panel to the ground. This will allow enough clearance for the gate to swing freely.

High wind areas: If the fence is over 6' tall or you are located in a high wind area it is recommended that you fill the "inside" of the posts half way up with concrete AFTER THE PANELS ARE INSTALLED, see figure 3. Prior to installing panels into the posts tape the lower rail to prevent concrete backflow, see figure 2.

Step 5

We recommend installing 1 post and 1 section at a time but there are many methods to install, as long as the end result is positive, feel free to alter this method to suit your installation method. Concrete and plumb first post and insert the assembled panel rails into the first post. Next, have the second post just sitting in the adjacent hole, insert assembled panel rails into the second post, then concrete and plumb. Repeat for all panels and posts. Be careful of windy days.

Step 6

To insure a quality job, it is strongly recommended that all post be set in concrete. To do this, hold post in place to prevent slippage. Fill remainder of hole around post with concrete up to 3" below ground level. Be sure to work concrete into hole around post as needed. We recommend you mix concrete and pour wet. Use a minimum of 2 of the 80 lbs. bags of quickcrete for each 5" post and 2 of the 60 lbs. bags for each 4" post.

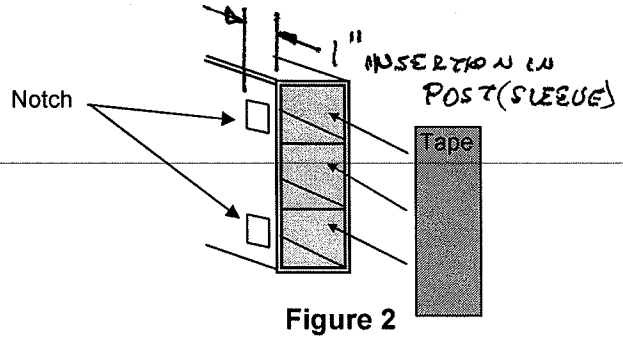


Figure 2

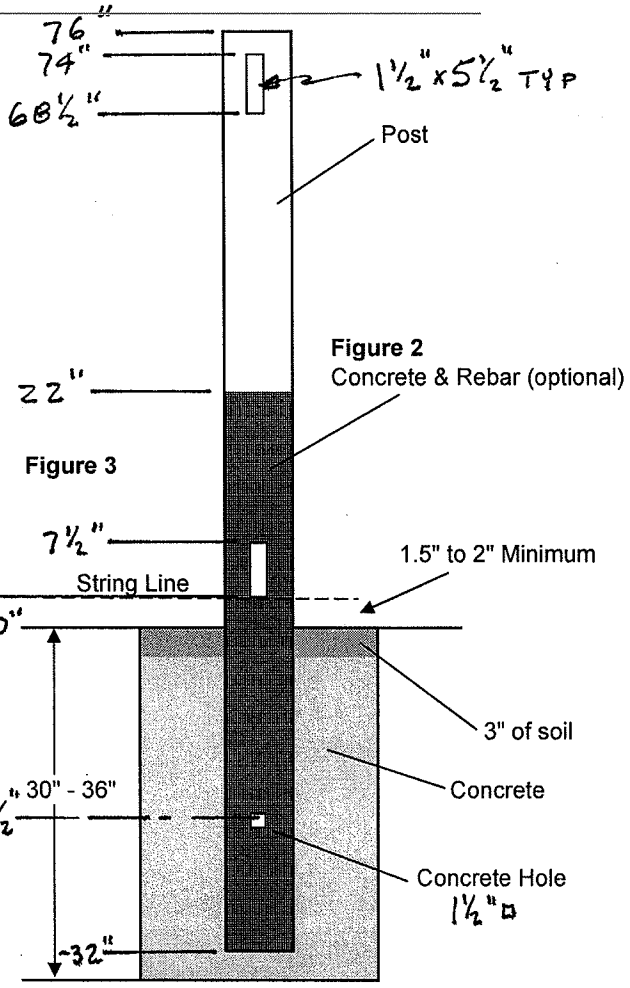


Figure 2
Concrete & Rebar (optional)

Figure 3

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# B2343.01-119-19

Date 5-14-08 Tech JFF

Helpful Hints:

If post does not already have concrete holes from factory, drill a minimum hole of 3/4" dia. 12" up from bottom of post. When gluing picket caps place a thin bead of glue inside the picket and press picket cap into picket. Post Caps should not be glued in the event you want to upgrade. Using a small amount of clear silicone on the inside corner of post cap will properly secure the cap to the post.

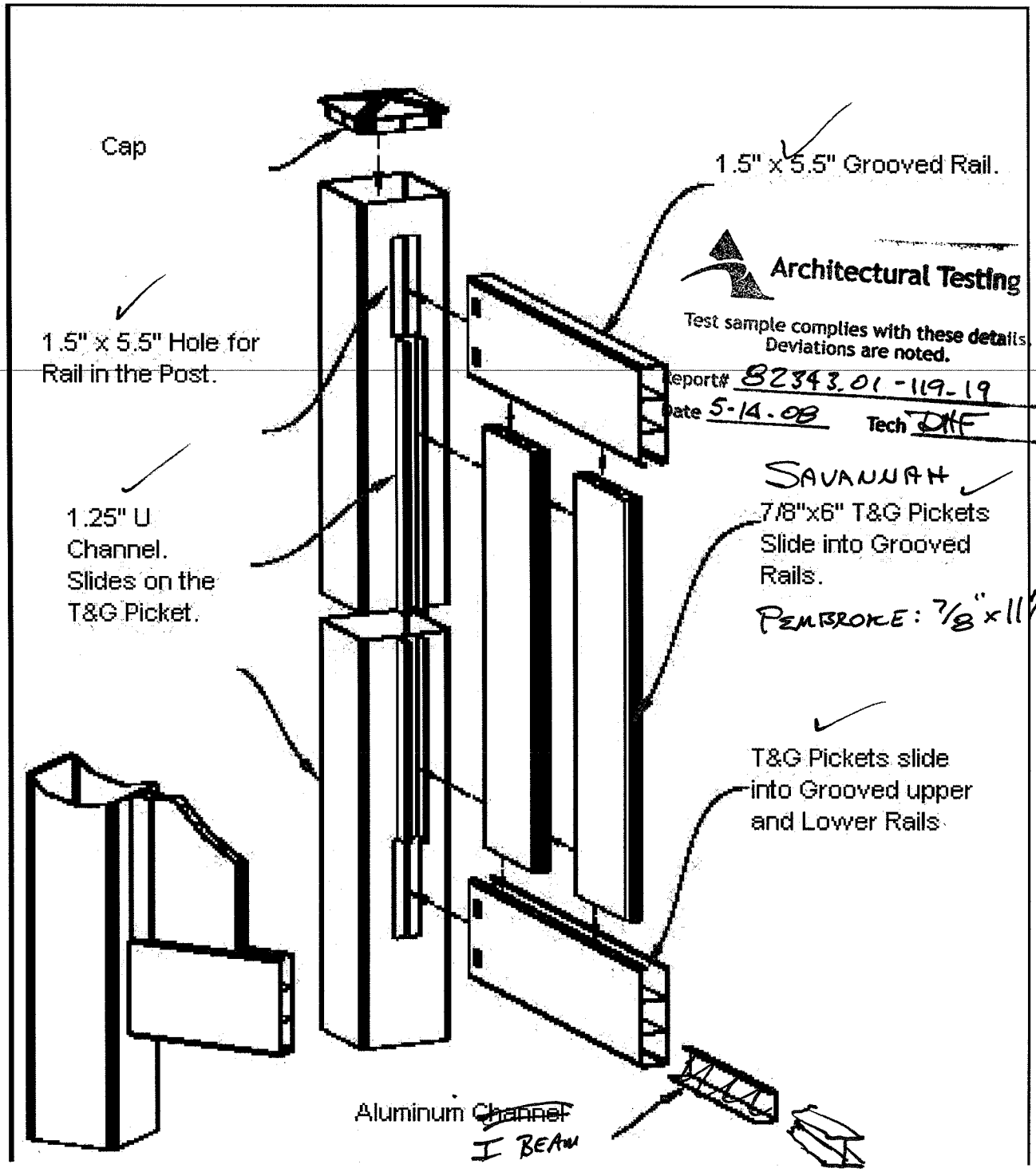
Maintenance

Clean your fence using the following formula:
1/3 cup powdered detergent
2/3 cup household cleaner
1 gallon water

For stain removal use one of the following:
Lacquer Thinner
Soft Scrub

CONCRETE FILL HEIGHT:

$\frac{108"}{2} - 32" = 22"$ ABOVE GRADE


Cap
1.5" x 5.5" Grooved Rail.
Architectural Testing
Test sample complies with these details.
Deviations are noted.
Report# 82343.01-119-19
Date 5-14-08 Tech DHF
1.5" x 5.5" Hole for Rail in the Post.
1.25" U Channel. Slides on the T&G Picket.
SAVANNAH
7/8"x6" T&G Pickets Slide into Grooved Rails.
PEMBROKE: 7/8"x11 1/4"
T&G Pickets slide into Grooved upper and Lower Rails
Aluminum ~~Channel~~ I BEAM

APPENDIX B

Photographs

Photo No. 1
Horizontal View through Post Routing Showing Inserted End of Bottom Rail, Groove Side of First Picket and Aluminum Reinforcement

Photo No. 2
Test Specimen in Rigid Test Fixture
48 in from Wind Generator Outlet

Photo No. 3
Typical Post Reinforcement during Dynamic Wind Load Testing

Photo No. 4
Test Specimen No. 1:
***Savannah* Less Mechanical Fasteners at 90 mph Wind Load**

Photo No. 5
Test Specimen No. 2 and 4:
#10 Screws in Top of Top Rail at Both Ends

Photo No. 6
Test Specimen No. 2:
***Savannah* with Pickets Screwed to Rails at 100 mph Wind Load**

Photo No. 7
Test Specimen No. 3:
***Pembroke* Less Mechanical Fasteners at 90 mph Wind Load**

Photo No. 8
Test Specimen No. 4:
***Pembroke* with Pickets Screwed to Rails at 110 mph Wind Load**

APPENDIX C

Calculations

Architectural Testing

WIND DESIGN PRESSURE ANALYSIS

Ref. ASCE 7-98 — *Privacy Fence* — *10/06/06*

Project: USA Vinyl
Job No.: 82343.01-119-19
Component: 6-ft. Privacy Fence
Date: 05/16/08

			ASCE 7-98 Ref.
Basic Wind Speed, V_{3s} =	130	mph (eq. 110 mph V_{fm})	
Structure Classification, Category:	I	Low Hazard	*Tbl. 1-1*
Exposure Category (A, B, C, D):	C		*6.5.6.1*
Exposure Coefficient, *Kz* =	0.85		*Tbl. 6-5*
Topographic Factor, *Kzt* =	1.0		
Directionality Factor, *Kd* =	1.0		*Tbl. 6-6*
Importance Factor, *I* =	0.77	(Hurricane Prone Region)	*Tbl. 6-1*
Velocity Pressure, $q_z = 0.00256 K_z K_{zt} K_d V^2 I$ =	28.3	psf	
Note: Values do not account for wind speed-up over hills and escarpments			
Gust Effect Factor, *G* =	0.85		*6.5.8*
Net Force Coefficient, C_f =	1.2		*Tbl. 6-11*
Design Wind Force, $F = q_z G C_f A_f$		(*Af* = Projected Area, ft^2)	*6.5.13*

Design Load:

Hgt.	Length	*Af*	*F* (lb)
6.0	8.0	48.0	1386

Architectural Testing

WIND DESIGN PRESSURE ANALYSIS

Ref. ASCE 7-98 — *Privacy Fence* — *10/06/06*

Project: USA Vinyl
Job No.: 82343.01-119-19
Component: 6-ft. Privacy Fence
Date: 05/16/08

			ASCE 7-98 Ref.
Basic Wind Speed, V_{3s} =	110	mph (eq. 90 mph V_{fm})	
Structure Classification, Category:	I	Low Hazard	*Tbl. 1-1*
Exposure Category (A, B, C, D):	C		*6.5.6.1*
Exposure Coefficient, *Kz* =	0.85		*Tbl. 6-5*
Topographic Factor, *Kzt* =	1.0		
Directionality Factor, *Kd* =	1.0		*Tbl. 6-6*
Importance Factor, *I* =	0.77	(Hurricane Prone Region)	*Tbl. 6-1*
Velocity Pressure, $q_z = 0.00256 K_z K_{zt} K_d V^2 I$ =	20.3	psf	
Note: Values do not account for wind speed-up over hills and escarpments			
Gust Effect Factor, *G* =	0.85		*6.5.8*
Net Force Coefficient, C_f =	1.2		*Tbl. 6-11*
Design Wind Force, $F = q_z G C_f A_f$		(*Af* = Projected Area, ft^2)	*6.5.13*

Design Load:

Hgt.	Length	*Af*	*F* (lb)
6.0	8.0	48.0	994