

PLY GEM FENCE/RAILING TEST REPORT

SCOPE OF WORK DYNAMIC WIND LOAD TESTING ON VARIOUS PVC PRIVACY FENCE SYSTEMS

REPORT NUMBER H0431.01-119-19-R1

TEST DATE(S) 10/30/17 - 11/08/17

 ISSUE DATE
 REVISED DATE

 01/15/18
 1/17/18

RECORD RETENTION END DATE 11/08/21

PAGES 48

DOCUMENT CONTROL NUMBER

ATI 00648 (07/24/17) RT-R-AMER-Test-2797 © 2017 INTERTEK





TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

REPORT ISSUED TO

PLY GEM FENCE/RAILING 15159 Andrew Jackson Highway 76 West Fair Bluff, NC 28439

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Ply Gem Fence/Railing, 15159 Andrew Jackson Highway 76 West Fair Bluff, NC 28439 to perform dynamic wind load testing in accordance with 2017 Florida Building Code, Building, on various configurations of their PVC privacy fence systems. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at the Intertek B&C test facility in York, PA.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.



This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 2

MATERIAL SOURCE/INSTALLATION

Test samples were provided by the client. Test samples were inspected by a representative of Intertek B&C prior to testing. No compromising defects were observed. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of four years from the test completion date.

Test specimens were assembled by an Intertek technician.

SECTION 3

EQUIPMENT

Wind Load Testing

Two propeller fan wind generators were utilized for testing. The propeller of each fan was 84 in. diameter and was comprised of four Kevlar composite airfoil units belt-driven by a high-output V8 engine. Wind speeds for the wind generators were calibrated according to AAMA 501.1-05. Deflections were measured with linear displacement transducers accurate to 0.01 inch

SECTION 4

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Frank Mueller	Ply Gem Fence/Railing
Adam J. Schrum	Intertek B&C
Alva R. Baker	Intertek B&C

SECTION 5

TEST PROCEDURES

Wind Load Testing

Each specimen consisted of a 2-panel/3-post fully assembled fence section installed onto a steel test fixture that was designed and fabricated 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. Linear transducers were fixed on the top rail, middle of the in-fill area, and bottom rail for deflection measurements. See drawings in Section 10 for detailed descriptions of assembly and components and photographs in Section 9 for specimen orientation respective to wind direction.

Wind load testing began at 30 mph and increased until failure or a maximum wind speed of 130 mph. Wind loads were performed with a relaxation period following 50 mph and 80 mph to record permanent set measurements.



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 6

TEST CALCULATIONS

The duration of the applied wind load at each wind speed was determined by using the following equation:

t = 3600 / Vfm

(Equation 1)

where:

t = duration (s), required for a one mile long sample of air to pass Vfm = "fastest mile" wind speed (mph)

Wind speeds used in testing correlate with "fastest mile" wind speeds (Vfm) for reference to codes and design standards. Maximum deflections were recorded at each load level.

SECTION 7

TEST SPECIMEN DESCRIPTIONS

	Sample	Set	No.	1
--	--------	-----	-----	---

SERIES/MODEL	KS2132					
DESCRIPTION	8 ft wide by 6 ft high (nominal) PVC privacy fence					
RAILS	Two, 2 in wide by 7 in. high by 94-1/2 in. long (0.110 in./0.070 in.					
	wall) PVC slotted rails per panel with two locking tabs per side on					
	each rail end.					
BOTTOM RAIL	One, 1-3/4 in. wide by 1-13/16 in. high by 94-1/2 in. long (0.070 in.					
REINFORCEMENT	wall) 6063-T6 aluminum "H"-shaped section.					
PANELS	Eight, 7/8 in. deep by 11-1/4 in. wide (11-5/8 in. wide including					
	tongue) by 61-1/4 in. long (0.060 in./0.040 in. wall) PVC tongue &					
	groove panels per section slip fit into the slotted rails unless noted					
	otherwise; the two center panels each included two locking tabs per					
	side on each end. The two end panels were each restrained by a 1 in.					
	wide by 1-3/8 in. high by 57-7/8 in. long (0.060 in. wall) PVC U-					
	channel attached to the post with three #10 x 3/4 in. stainless steel					
	pan head screws.					
POSTS	Three 5 in. by 5 in. by 102 in. long (0.150 in. wall) routed PVC posts					
POST	One 4-5/8 in. deep by 4-1/2 in. wide by 64 in. long (0.100 in./0.080					
REINFORCEMENT	in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the					
	post reinforcement extended 38 in. above ground level.					
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking					
	tabs at the rail ends engaged the rail in the post.					



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2130					
DESCRIPTION	8 ft wide by 6 ft high (nominal) PVC privacy fence					
RAILS	Two, 2 in. wide by 7 in. high by 94-1/2 in. long (0.110 in./0.070 in.					
	wall) PVC slotted rails per panel with two locking tabs per side on each rail end.					
BOTTOM RAIL	One, 1-3/4 in. wide by 1-13/16 in. high by 94-1/2 in. long (0.070 in.					
REINFORCEMENT	wall) 6063-T6 aluminum "H"-shaped section.					
PANELS	Fifteen, 7/8 in. deep by 6 in. wide (6-5/16 in. wide including tongue) by 61-1/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove					
	panels per section slip fit into the slotted rails unless noted					
	otherwise; the three center panels each included two locking tabs					
	per side on each end. The two end panels were each restrained by a					
	1 in. wide by 1-3/8 in. high by 57-7/8 in. long (0.060 in. wall) PVC U-					
	channel attached to the post with three #10 x 3/4 in. stainless steel					
	pan head screws.					
POSTS	Three 5 in. by 5 in. by 102 in. long (0.150 in. wall) routed PVC posts					
POST	One 4-5/8 in. deep by 4-1/2 in. wide by 64 in. long (0.100 in./0.080					
REINFORCEMENT	in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the					
	post reinforcement extended 38 in. above ground level.					
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking					
	tabs at the rail ends engaged the rail in the post.					



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2129					
DESCRIPTION	8 ft wide by 6 ft high (nominal) PVC privacy fence					
RAILS	Two, 1-1/2 in. wide by 5-1/2 in. high by 94-1/2 in. long (0.085					
	in./0.055 in. wall) PVC slotted rails per panel with two locking tabs per side on each rail end.					
BOTTOM RAIL	One, 1-1/4 in. wide by 2-5/16 in. high by 94-1/2 in. long (0.075 in.					
REINFORCEMENT	wall) 6005-T5 aluminum "I"-shaped section.					
PANELS	Fifteen, 7/8 in. deep by 6 in. wide (6-5/16 in. wide including tongue)					
	by 64-1/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove					
	panels per section slip fit into the slotted rails unless noted					
	otherwise; the three center panels each included two locking tabs					
	per side on each end. The two end panels were each restrained by a					
	1 in. wide by 1-3/8 in. high by 60-7/8 in. long (0.060 in. wall) PVC U-					
	channel attached to the post with three #10 x 3/4 in. stainless steel					
	pan head screws.					
POSTS	Three 5 in. by 5 in. by 102 in. long (0.150 in. wall) routed PVC posts					
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 64 in. long (0.100 in./0.080					
	in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the					
	post reinforcement extended 38 in. above ground level.					
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking					
	tabs at the rail ends engaged the rail in the post.					



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2131					
DESCRIPTION	8 ft wide by 6 ft high (nominal) PVC privacy fence					
RAILS	Two, 1-1/2 in. wide by 5-1/2 in. high by 94-1/2 in. long (0.085					
	in./0.055 in. wall) PVC slotted rails per panel with two locking tabs					
	per side on each rail end.					
BOTTOM RAIL	One, 1-1/4 in. wide by 2-5/16 in. high by 94-1/2 in. long (0.075 in.					
REINFORCEMENT	wall) 6005-T5 aluminum "I"-shaped section.					
PANELS	Eight, 7/8 in. deep by 11-1/4 in. wide (11-5/8 in. wide including					
	tongue) by 64-1/4 in. long (0.060 in./0.040 in. wall) PVC tongue &					
	groove panels per section slip fit into the slotted rails unless noted					
	otherwise; the two center panels each included two locking tabs per					
	side on each end. The two end panels were each restrained by a 1 in.					
	wide by 1-3/8 in. high by 60-7/8 in. long (0.060 in. wall) PVC U-					
	channel attached to the post with three #10 x 3/4 in. stainless steel					
	pan head screws.					
POSTS	Three 5 in. by 5 in. by 102 in. long (0.150 in. wall) routed PVC posts					
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 64 in. long (0.100 in./0.080					
	in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the					
	post reinforcement extended 38 in. above ground level.					
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking					
	tabs at the rail ends engaged the rail in the post.					



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2136
DESCRIPTION	6 ft wide by 8 ft high (nominal) PVC privacy fence
RAILS	Three, 2 in. wide by 7 in. high by 72 in. long (0.110 in./0.070 in. wall) PVC slotted rails per panel with two locking tabs per side on each rail end; the center rail had a 7/8 in. wide routed slot along the bottom surface for insertion of the bottom panels.
MIDDLE AND BOTTOM RAIL REINFORCEMENT	One, 1-3/4 in. wide by 1-13/16 in. high by 72 in. long (0.070 in. wall) 6063-T6 aluminum "H"-shaped section.
PANELS	Twelve (six upper panel and six lower panel), 7/8 in. deep by 11-1/4 in. wide (11-5/8 in. wide including tongue) by 40-3/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove panels per section slip fit into the slotted rails unless noted otherwise; the four (two upper panel and two lower panel) center panels each included two locking tabs per side on each end. The two end panels were each restrained by a 1 in. wide by 1-3/8 in. high by 37-1/4 in. long(lower panel)/37-1/2 in. long(upper panel) (0.060 in. wall) PVC U-channel attached to the post with two #10 x 3/4 in. stainless steel pan head screws.
POSTS	Three 5 in. by 5 in. by 136 in. long (0.150 in. wall) routed PVC posts
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 96 in. long (0.100 in./0.080 in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the post reinforcement extended 60 in. above ground level.
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking tabs at the rail ends engaged the rail in the post.



130 Derry Court York, Pennsylvania 17406

Telephone: 717-764-7700 Facsimile: 717-764-4129 www.intertek.com/building

TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2135
DESCRIPTION	6 ft wide by 8 ft high (nominal) PVC privacy fence
RAILS	Three, 1-1/2 in. wide by 5-1/2 in. high by 72 in. long (0.085 in./0.055 in. wall) PVC slotted rails per panel with two locking tabs per side on each rail end; the center rail had a 7/8 in. wide routed slot along the bottom surface for insertion of the bottom panels.
MIDDLE AND BOTTOM RAIL REINFORCEMENT	One, 1-3/4 in. wide by 1-13/16 in. high by 72 in. long (0.070 in. wall) 6063-T6 aluminum "H"-shaped section.
PANELS	Twelve (six upper panel and six lower panel), 7/8 in. deep by 11-1/4 in. wide (11-5/8 in. wide including tongue) by 42-3/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove panels per section slip fit into the slotted rails unless noted otherwise; the four (two upper panel and two lower panel) center panels each included two locking tabs per side on each end. The two end panels were each restrained by a 1 in. wide by 1-3/8 in. high by 39-7/8 in. long (lower panel)/39-3/8 in. long(upper panel) (0.060 in. wall) PVC U-channel attached to the post with two #10 x 3/4 in. stainless steel pan head screws.
POSTS	Three 5 in. by 5 in. by 136 in. long (0.150 in. wall) routed PVC posts
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 96 in. long (0.100 in./0.080 in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the post reinforcement extended 60 in. above ground level.
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking tabs at the rail ends engaged the rail in the post.



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2133
DESCRIPTION	6 ft wide by 8 ft high (nominal) PVC privacy fence
RAILS	Three, 1-1/2 in. wide by 5-1/2 in. high by 70-1/2 in. long (0.085 in./0.055 in. wall) PVC slotted rails per panel with two locking tabs per side on each rail end; the center rail had a 7/8 in. wide routed slot along the bottom surface for insertion of the bottom panels.
MIDDLE AND BOTTOM RAIL REINFORCEMENT	One, 1-3/4 in. wide by 1-13/16 in. high by 70-1/2 in. long (0.070 in. wall) 6063-T6 aluminum "H"-shaped section.
PANELS	Twenty-two (eleven upper panel and eleven lower panel), 7/8 in. deep by 6 in. wide (6-5/16 in. wide including tongue) by 42-3/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove panels per section slip fit into the slotted rails unless noted otherwise; the six (three upper panel and three lower panel) center panels each included two locking tabs per side on each end. The two end panels were each restrained by a 1 in. wide by 1-3/8 in. high by 39-7/8 in. long (lower panel)/39-3/8 in. long (upper panel) (0.060 in. wall) PVC U-channel attached to the post with two #10 x 3/4 in. stainless steel pan head screws.
POSTS	Three 5 in. by 5 in. by 136 in. long (0.150 in. wall) routed PVC posts
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 96 in. long (0.100 in./0.080 in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the post reinforcement extended 60 in. above ground level.
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking tabs at the rail ends engaged the rail in the post.



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST SPECIMEN DESCRIPTIONS (continued)

SERIES/MODEL	KS2134
DESCRIPTION	6 ft wide by 8 ft high (nominal) PVC privacy fence
RAILS	Three, 2 in. wide by 7 in. high by 70-1/2 in. long (0.110 in./0.070 in. wall) PVC slotted rails per panel with two locking tabs per side on each rail end; the center rail had a 7/8 in. wide routed slot along the bottom surface for insertion of the bottom panels.
MIDDLE AND BOTTOM RAIL REINFORCEMENT	One, 1-3/4 in. wide by 1-13/16 in. high by 70-1/2 in. long (0.070 in. wall) 6063-T6 aluminum "H"-shaped section.
PANELS	Twenty-two (eleven upper panel and eleven lower panel), 7/8 in. deep by 6 in. wide (6-5/16 in. wide including tongue) by 40-3/4 in. long (0.060 in./0.040 in. wall) PVC tongue & groove panels per section slip fit into the slotted rails unless noted otherwise; the six (three upper panel and three lower panel) center panels each included two locking tabs per side on each end. The two end panels were each restrained by a 1 in. wide by 1-3/8 in. high by 37-1/4 in. long(lower panel)/37-1/2 in. long (upper panel) (0.060 in. wall) PVC U-channel attached to the post with two #10 x 3/4 in. stainless steel pan head screws.
POSTS	Three 5 in. by 5 in. by 136 in. long (0.150 in. wall) routed PVC posts
POST REINFORCEMENT	One 4-5/8 in. deep by 4-1/2 in. wide by 96 in. long (0.100 in./0.080 in. wall) 6063-T6 aluminum, double-webbed "I"-shaped section; the post reinforcement extended 60 in. above ground level.
RAIL ATTACHMENT	Routed holes in the posts captured the ends of the rails. The locking tabs at the rail ends engaged the rail in the post.



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 8

TEST RESULTS

Sample Set No. 1; Model: *KS2132* Specimen No.: 1 Test Date: 10/30/17

		MAXIMUM DEFLECTION (inches)					
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	0.65	0.90	0.57	0.79	0.21	0.29
40 mph	90 sec	0.84	1.56	1.32	1.41	0.40	0.41
50 mph	72 sec	2.35	2.42	2.08	2.15	0.59	0.60
0 mph	Permanent Set	0.07	0.04	0.04	0.03	0.02	0.00
60 mph	60 sec	3.14	3.45	2.70	2.98	0.74	0.78
70 mph	51 sec	3.92	4.03	3.45	3.65	0.91	0.96
75 mph	48 sec	4.08	4.75	3.66	4.08	0.96	1.06
80 mph	45 sec	4.64	5.20	3.89	4.43	0.99	1.13
0 mph	Permanent Set	0.17	0.13	0.16	0.18	0.06	0.04
90 mph	40 sec	6.19	6.75	5.74	6.20	1.28	1.69
100 mph	36 sec	7.56	8.05	6.37	7.08	1.42	1.88
110 mph	33 sec	8.18	8.94	6.81	7.60	1.57	2.02
115 mph	32 sec	8.41	9.56	6.95	8.88	1.61	2.40

Observation: Specimen successfully withstood 115 mph wind speed without failure; specimen failed attempting to reach 120 mph.

Maximum Sustained Wind, V_{fm} = 115 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 131 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 2; Model: *KS2130* Specimen No.: 1 Test Date: 10/30/17

		MAXIMUM DEFLECTION (inches)					
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	0.69	0.80	0.48	0.59	0.10	0.18
40 mph	90 sec	1.02	1.10	0.89	0.99	0.24	0.27
50 mph	72 sec	2.08	2.18	1.56	1.73	0.41	0.48
0 mph	Permanent Set	0.22	0.03	0.07	0.11	0.05	0.07
60 mph	60 sec	3.06	2.97	2.37	2.49	0.60	0.69
70 mph	51 sec	3.77	3.71	2.95	3.24	0.75	0.89
75 mph	48 sec	4.48	4.68	3.41	3.94	0.83	1.06
80 mph	45 sec	4.64	5.23	3.59	4.23	0.86	1.13
0 mph	Permanent Set	0.31	0.20	0.07	0.03	0.01	0.03
90 mph	40 sec	6.84	6.58	5.23	5.57	1.18	2.67
100 mph	36 sec	7.21	n/a	5.58	6.45	1.26	n/a
110 mph	33 sec	8.12	n/a	6.01	7.48	1.39	n/a
115 mph	32 sec	9.23	n/a	7.26	7.97	1.63	n/a

Observation: Specimen successfully withstood 115 mph wind speed without failure; specimen failed attempting to reach 120 mph.

n/a indicates transducer disconnected from specimen during test.

Maximum Sustained Wind, V_{fm} = 115 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 131 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 3; Model: *KS2129* Specimen No.: 1 Test Date: 10/31/17

		MAXIM	UM DEFLI	ECTION (i			
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	1.70	1.72	1.49	1.54	0.72	0.83
40 mph	90 sec	2.66	2.88	2.24	2.50	1.08	1.26
50 mph	72 sec	5.08	4.48	4.32	3.83	2.02	1.94
0 mph	Permanent Set	0.12	0.11	0.13	0.11	0.06	0.08
60 mph	60 sec	5.55	7.12	4.95	5.97	2.60	2.94
70 mph	51 sec	7.78	9.19	6.43	7.85	3.01	4.07
75 mph	48 sec	8.91	10.16	7.44	8.57	3.56	4.73
80 mph	45 sec	10.03	11.26	8.31	9.81	4.02	5.37
0 mph	Permanent Set	0.52	0.55	0.38	0.68	0.19	0.49

Observation: Specimen successfully withstood 80 mph wind speed without failure; specimen failed attempting to reach 90 mph.

Maximum Sustained Wind, V_{fm} = 80 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 95 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 4; Model: *KS2131* Specimen No.: 1 Test Date: 10/31/17

		MAXIM	JM DEFLE	ECTION (i			
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	1.21	1.68	0.99	1.42	0.48	0.72
40 mph	90 sec	2.47	3.03	2.02	2.68	0.97	1.39
50 mph	72 sec	5.24	5.11	4.35	4.55	2.04	2.31
0 mph	Permanent Set	0.17	0.13	0.14	0.17	0.01	0.07
60 mph	60 sec	6.89	6.73	5.69	5.88	2.68	2.89
70 mph	51 sec	7.72	8.61	6.70	7.48	3.20	3.90
75 mph	48 sec	9.22	9.56	7.52	8.43	3.56	4.15
80 mph	45 sec	10.78	10.15	8.89	8.84	4.21	4.72
0 mph	Permanent Set	0.50	0.48	0.31	0.48	0.11	0.38

Observation: Specimen successfully withstood 80 mph wind speed without failure; specimen failed attempting to reach 90 mph.

Maximum Sustained Wind, V_{fm} = 80 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 95 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 4; Model: *KS2131* Specimen No.: 2 Test Date: 10/31/17

		MAXIM	UM DEFLI	ECTION (i			
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	0.89	1.14	0.70	1.12	0.27	0.68
40 mph	90 sec	1.51	1.97	1.66	2.17	0.93	1.30
50 mph	72 sec	2.70	2.70	2.74	2.88	1.57	1.72
0 mph	Permanent Set	0.06	0.06	0.11	0.08	0.05	0.03
60 mph	60 sec	3.82	3.59	3.95	4.05	2.26	2.50
70 mph	51 sec	4.45	5.13	4.60	5.42	2.52	3.29
75 mph	48 sec	5.74	6.15	5.72	6.46	3.17	3.90
80 mph	45 sec	6.10	6.74	5.99	7.15	3.31	4.67
0 mph	Permanent Set	0.26	0.37	0.16	0.37	0.07	0.51

Observation: Specimen successfully withstood 80 mph wind speed without failure; specimen failed attempting to reach 90 mph.

Maximum Sustained Wind, V_{fm} = 80 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 95 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 5; Model: *KS2136* Specimen No.: 1 Test Date: 10/31/17

		MAXIM	UM DEFLE	ECTION (inches)				
		Тор		Mid		Bottom		
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right	
30 mph	120 sec	0.41	0.69	0.38	0.54	0.17	0.33	
40 mph	90 sec	1.07	1.20	0.75	0.83	0.34	0.42	
50 mph	72 sec	1.89	1.95	1.27	1.32	0.53	0.65	
0 mph	Permanent Set	0.09	0.04	0.07	0.05	0.09	0.10	
60 mph	60 sec	2.37	2.60	1.55	1.75	0.63	0.79	
70 mph	51 sec	2.93	2.96	2.03	2.07	0.79	1.03	
75 mph	48 sec	3.39	3.63	2.25	2.51	0.90	1.17	
80 mph	45 sec	3.68	4.17	2.30	2.95	0.97	1.31	
0 mph	Permanent Set	0.27	0.28	0.20	0.26	0.11	0.15	
90 mph	40 sec	4.88	5.55	3.31	3.72	1.53	1.73	
100 mph	36 sec	n/a	6.42	3.56	4.86	n/a	n/a	
110 mph	33 sec n/a		7.98	4.10	5.05	n/a	n/a	
115 mph	n 32 sec		14.36	4.70	6.51	n/a	n/a	
120 mph	20 mph 30 sec		n/a	5.99	7.41	n/a	n/a	

Observation: Specimen successfully withstood 120 mph wind speed without failure; specimen failed attempting to reach 130 mph.

n/a indicates transducer disconnected from specimen during test.

Maximum Sustained Wind, V_{fm} = 120 mph Equivalent 3-second gust, V_{3s} = (1.05 x $V_{fm})$ + 10.5 = 137 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 6; Model: *KS2135* Specimen No.: 1 Test Date: 11/1/17

		MAXIM		ECTION (i			
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	0.70	0.80	0.45	0.36	0.14	0.13
40 mph	90 sec	1.05	0.95	0.78	0.63	0.27	0.27
50 mph	72 sec	1.86	1.96	1.26	1.28	0.43	0.46
0 mph	Permanent Set	0.14	0.13	0.11	0.08	0.04	0.06
60 mph	60 sec	2.40	2.52	1.70	1.63	0.57	0.60
70 mph	51 sec	3.02	2.99	2.02	1.88	0.72	0.73
75 mph	48 sec	3.33	3.32	2.31	2.10	0.77	0.79
80 mph	45 sec	3.89	3.85	2.61	2.50	0.90	0.89
0 mph	Permanent Set	0.23	0.17	0.16	0.12	0.04	0.10
90 mph	40 sec	5.56	5.03	3.73	3.17	1.28	3.09
100 mph	36 sec	6.76	5.89	4.50	3.66	n/a	3.20
110 mph	33 sec	n/a	6.51	4.96	4.25	n/a	3.46
115 mph	5 mph 32 sec		7.60	5.99	4.68	n/a	n/a
120 mph	120 mph 30 sec		n/a	6.94	5.50	n/a	n/a

Observation: Specimen successfully withstood 120 mph wind speed without failure; specimen failed attempting to reach 130 mph.

n/a indicates transducer disconnected from specimen during test.

Maximum Sustained Wind, V_{fm} = 120 mph Equivalent 3-second gust, V_{3s} = (1.05 x $V_{fm})$ + 10.5 = 137 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 7; Model: *KS2133* Specimen No.: 1 Test Date: 11/1/17

		MAXIM		ECTION (inches)				
		Тор	Тор		Mid			
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right	
30 mph	120 sec	0.56	0.61	0.32	0.35	0.10	0.14	
40 mph	90 sec	0.84	0.70	0.45	0.36	0.13	0.14	
50 mph	72 sec	1.33	1.35	0.65	0.64	0.18	0.21	
0 mph	Permanent Set	0.04	0.06	0.09	0.05	0.03	0.01	
60 mph	60 sec	1.90	1.85	0.91	0.85	0.25	0.26	
70 mph	51 sec	2.36	2.44	1.11	1.08	0.31	0.32	
75 mph	48 sec	2.72	2.59	1.27	1.12	0.35	0.32	
80 mph	45 sec	3.03	2.94	1.39	1.26	0.40	0.36	
0 mph	Permanent Set	0.23	0.19	0.18	0.11	0.07	0.02	
90 mph	40 sec	4.15	3.86	1.77	1.62	0.55	0.46	
100 mph	36 sec	4.73	4.53	2.00	1.82	0.57	0.48	
110 mph	33 sec	5.16	4.92	2.14	1.99	0.67	0.59	
115 mph	32 sec	5.89	5.76	2.37	2.22	0.70	0.61	
120 mph	30 sec	6.76	6.47	2.73	2.42	n/a	n/a	
130 mph	28 sec	7.52	7.71	2.96	n/a	n/a	n/a	

Observation: Specimen successfully withstood 120 mph wind speed without failure; specimen failed attempting to reach 130 mph.

n/a indicates transducer disconnected from specimen during test.

Maximum Sustained Wind, V_{fm} = 130 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 147 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

TEST RESULTS (continued)

Sample Set No. 8; Model: *KS2134* Specimen No.: 1 Test Date: 11/8/17

		MAXIM		ECTION (inches)			
		Тор		Mid		Bottom	
WIND SPEED	DURATION	Left	Right	Left	Right	Left	Right
30 mph	120 sec	0.43	0.48	0.23	0.26	0.07	0.01
40 mph	90 sec	0.82	0.89	0.42	0.43	0.11	0.15
50 mph	72 sec	1.36	1.47	0.68	0.70	0.18	0.20
0 mph	Permanent Set	0.15	0.13	0.10	0.08	0.02	0.03
60 mph	60 sec	1.79	1.72	0.87	0.82	0.23	0.25
70 mph	51 sec	2.30	2.50	1.08	1.13	0.29	0.35
75 mph	48 sec	2.47	2.72	1.16	1.22	0.31	0.36
80 mph	45 sec	2.67	2.87	1.21	1.32	0.31	0.40
0 mph	Permanent Set	0.24	0.27	0.18	0.16	0.03	0.06
90 mph	40 sec	3.56	3.90	1.61	1.69	0.40	0.49
100 mph	36 sec	4.01	4.73	1.79	1.93	0.45	0.57
110 mph	33 sec	4.77	5.13	2.01	2.11	0.53	0.60
115 mph	32 sec	5.26	5.96	2.17	2.34	0.54	0.66
120 mph	30 sec	n/a	n/a	2.49	2.68	0.68	0.80
130 mph 28 sec		n/a	n/a	2.71	2.92	0.84	0.84

Observation: Specimen successfully withstood 120 mph wind speed without failure; specimen failed attempting to reach 130 mph.

n/a indicates transducer disconnected from specimen during test.

Maximum Sustained Wind, V_{fm} = 130 mph Equivalent 3-second gust, V_{3s} = (1.05 x V_{fm}) + 10.5 = 147 mph



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 9 PHOTOGRAPHS



Telephone: 717-764-7700 Facsimile: 717-764-4129 www.intertek.com/building



Photo No. 1 Test Specimen in Rigid Test Fixture



Photo No. 2 Transducer Locations on Backside of Fence Panels



TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 10

DRAWINGS

The "As-Built" drawings for the various PVC privacy fence systems which follow have been reviewed by Intertek B&C and are representative of the project reported herein. Project construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



with 2 x 7 Rails & 7/8 x 11 1/4 T&G Pickets



THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

drawings are confidential and are the property of ply gem fence & railing ${\mathbb O}$ mar 2017.

KS2132 Sheet 1 of 2 03-13-17



with 2 x7 Rails & 7/8 x 11 1/4 T&G Pickets



03-13-17



with 1 1/2 x 5 1/2 Rail & 7/8 x 6 T&G Picket



THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING $\, {f C} \,$ mar 2017. $\,$

Sheet 1 of 2 03-13-17

KS2129



with 1 1/2 x 5 1/2 Rails & 7/8 x 6 T&G Pickets



DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING \odot MAR 2017.

Sheet 2 of 2 03-13-17



with 2 x 7 Rails & 7/8 x 6 T&G Pickets



THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

drawings are confidential and are the property of ply gem fence & railing $\, \mathbb{O} \,$ mar 2017.

Sheet 1 of 2 03-13-17

KS2130

with 2 x 7 Rails & 7/8 x 6 T&G Pickets

with 1 1/2 x 5 1/2 Rails & 7/8 x 11 1/4 T&G Pickets

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

drawings are confidential and are the property of ply gem fence & railing $\, {}^{\mathbb{O}}$ mar 2017.

KS2131 Sheet 1 of 2 03-13-17

with 1 1/2 x 5 1/2 Rails & 7/8 x 11 1/4 T&G Pickets

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f \mathbb O}$ mar 2017.

Sheet 2 of 2 03-13-17

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

KS2133 Sheet 1 of 2 03-14-17

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f \mathbb O}$ mar 2017.

with 1 1/2 x 5 1/2 Rail & 7/8 x 6 T&G Picket

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

drawings are confidential and are the property of ply gem fence & railing ${\mathbb O}$ mar 2017.

Sheet 2 of 2 03-14-17

KS2133

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f igodoldsymbol C}$ mar 2017.

KS2134 Sheet 1 of 2 03-14-17

with 2 x 7 Rail & 7/8 x 6 T&G Picket

NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f \mathbb O}$ mar 2017.

Sheet 2 of 2 03-14-17

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f \mathbb O}$ mar 2017.

Sheet 1 of 2 03-15-17

KS2135

96" H x 73 1/2" W Solid Privacy / Ply Gem-

with 1 1/2 x 5 1/2 Rail & 7/8 x 11 1/4 T&G Picket

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING ${f \mathbb O}$ mar 2017.

Sheet 2 of 2 03-15-17

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

DRAWINGS ARE CONFIDENTIAL AND ARE THE PROPERTY OF PLY GEM FENCE & RAILING \bigcirc MAR 2017.

Sheet 1 of 2 03-15-17

KS2136

96" H x 73 1/2" W Solid Privacy PlyGe

with 2 x 7 Rail & 7/8 x 11 1/4 T&G Picket

THIS DRAWING WAS MADE AND INTENDED FOR USE AS A GUIDE ONLY. ANY PRODUCT SUBSTITUTION OR VARIANCE MAY COMPROMISE THE STRUCTURE, DESIGN AND PERFORMANCE OF THE PRODUCT. NO WARRANTY IS EXPRESSED OR IMPLIED BY THIS DRAWING AND PLY GEM FENCE & RAIL.

drawings are confidential and are the property of ply gem fence & railing $\, \mathbb{O} \,$ mar 2017.

KS2136 Sheet 2 of 2 03-15-17

2.658 in^3 0.141 lbmass weight 0 weight 0 of KKOV BUILDANG PRODUCT OF KKOV BUILDANG PRODUCT		Weight for Capstock 0.026 Valls +.000015	Capsuck vvgt variable .0394 Angular 30 Fractions ± 1/16 Weight for Inner Material 0.105 Break all Sharp Edges. 003015	Inner Mati Wyt Variable .053 x ± 030 xx ± 010 xxx ± .005	Inner Material Volume 1.9900 Unless Otherwise Specified Cap Stock Volume 0 6680 Dimensions are in Inches	DETAIL VIEW B 1.375 ± 030 B 1.375 ± 030 C $R_{1/8}^{3/16}$ $R_{1/8}^{3/16}$	CAPSTOCK REQUIRED ON THIS END SURFACE
ED, OR DISCLOSED IN WHOLE OR IN PART FOR. NC WHERE SUCH PERMISSION IS GRANTED PART KROY BUILDING PRODUCTS, INC RESER	NUMBER		RRQ 8/3	RRQ 8/3	KROY B		
ANY PURPOSE WITHOUT EXPRESS WRITTEN PERMOSIO THIS LEGEND SHALL BE MARKED ON ANY REPRODUCT VES ALL RUGHTS TO THE DESIGN DISCLOSED HEREIN	pw_pvc_0875_xxx_063_xxx_U-c	NUMBER	31/2015	31/2015 7/8" U	UILDING PROD	NOTED REFERENCE [MAY NOT BE LESS TH REE STATE Architectural Tr Marchitectural Tr Deviations are noted Deviations are noted	MEASURE NOTED WIL SORNERS OF PROFIL
TION 1 OF 1	channel.ipt	LETTER A		-Channel	UCTS INC.	esting se details.	OTH ACROSS E

TEST REPORT FOR PLY GEM FENCE/RAILING

Report No.: H0431.01-119-19-R1 Date: 01/15/18

SECTION 11

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	01/15/18	N/A	Original Report Issue
			Updated the U-channel length to 37-1/4 in
1	01/17/18	11	long (lower panel)