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TREX COMPANY
TEST REPORT

SCOPE OF WORK
DYNAMIC WIND LOAD TESTING ON 8 FT WIDE BY 8 FT HIGH SECLUSIONS® FENCING

REPORT NUMBER
K4991.02-119-19-R1

TEST DATE
01/08/20

ISSUE DATE **REVISED DATE**
02/11/20 02/12/20

RECORD RETENTION END DATE
01/08/24

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15

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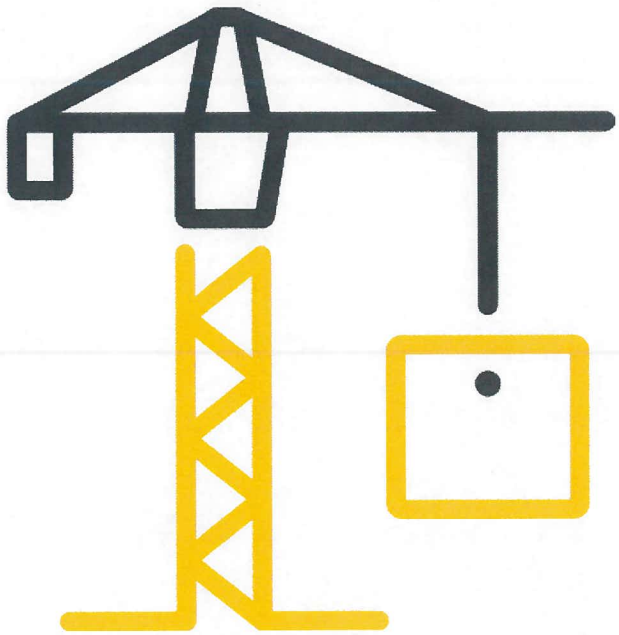

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TEST REPORT FOR TREX COMPANY
Report No.: K4991.02-119-19-R1
Date: 02/11/20

REPORT ISSUED TO
TREX COMPANY, INC.
160 Exeter Drive
Winchester, VA 22603

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Trex Company to perform dynamic wind load testing on their 8 ft wide by 8 ft high Seclusions® wood-plastic composite privacy fence system. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek B&C's test facility in York, PA.

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

For INTERTEK B&C:

COMPLETED BY:	Robert G. Spayd	**REVIEWED BY:**	Travis A. Hoover
TITLE:	Technician II	**TITLE:**	Program Manager
SIGNATURE:	Digitally Signed by: Robert Spayd	**SIGNATURE:**	Travis A. Hoover/aas Digitally Signed for: Travis Hoover by Amanda Ashby
DATE:	02/12/20	**DATE:**	02/12/20

RGS:vtm/aas

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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 the client.

SECTION 3
EQUIPMENT

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

SECTION 4
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Glenn Muse	Trex Company
Ben Arthur	Trex Company
Sarah Price	Trex Company
Chris Scoville	Trex Company
Isaiah Gebhart	Intertek B&C
Scott T. Gladfelter	Intertek B&C
Kevin Eichelberger	Intertek B&C
Adam Schrum	Intertek B&C

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SECTION 5
TEST PROCEDURE

Three specimens (each consisting of a 2-panel/3-post fully assembled fence section) were tested. Each fence panel measured approximately 8 ft wide by 8 ft high. See drawings in Section 10 for detailed descriptions of assembly and components.

A steel test fixture was designed and fabricated to simulate a rigid post embedment. The bottom of the bottom rail was fixed at 3/8 in above the top of the test fixture. The wind generator outlet was located 4 ft from the face of the specimen and centered between the two panels. Linear transducers were fixed on the midspan of the top rail, middle of the infill area, and midspan of the 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 with respect to wind direction.

Wind load testing began at 75 mph for all specimens and increased until failure or a maximum wind speed of 130 mph. Wind loads were performed with a relaxation period, following client-specified wind loads, to record permanent set measurements.

SECTION 6
TEST CALCULATIONS

Wind Load Testing

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 (s), required for a one mile long sample of air to pass
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.

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SECTION 7
TEST SPECIMEN DESCRIPTIONS

SERIES/MODEL	Seclusions® Privacy Fence
DESCRIPTION	8 ft wide by 8 ft high wood-plastic composite privacy fence
TOP RAIL	4 in wide by 4-3/4 in high by 1/2 in wall by 91 in long "T"-shaped wood-plastic composite extrusion with 1-7/16 in slot to accept pickets
BOTTOM RAIL	2-3/4 in wide by 5-1/8 in high by 0.08 in wall by 90-1/2 in long "H"-shaped 6063-T5 aluminum extrusion, which accepts two (2) 91 in long bottom rail covers to create bottom rail assembly, with 1-1/4 in slot to accept pickets
PICKET/BOTTOM RAIL COVER	5-3/4 in wide by 1 in deep by 1/4 in wall by 91 in long "C"-shaped wood-plastic composite extrusion
INFILL PANEL	Nineteen (19) pickets (oriented vertically) per panel inserted into slots in top and bottom rails. First and last pickets attached to posts using three (3) #8 x 1-5/8 in self-starting wood screws at top/middle/bottom of each picket. Third-to-last picket at one end of panel secured to top and bottom rails on one side of panel using one (1) #8 x 1-5/8 in self-starting wood screw to maintain tightness of interlocking pickets.
POST	5 in square by 1/2 in wall by 144 in long hollow wood-plastic composite extrusion (30 in embedment)
RAIL ATTACHMENT	Four (4) nylon rail brackets per panel attached to posts using four (4) #8 x 1-5/8 in self-starting wood screws per bracket. Top rail attached to brackets using one (1) #8 x 1-5/8 in self-starting wood screw through top of rail at each end of rail.

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Date: 02/11/20

SECTION 8
TEST RESULTS

Seclusions® Privacy Fence
Test No. 1
Test Date: 01/08/20

WIND SPEED	DURATION	MAXIMUM DEFLECTION (in)					
		TOP		MID		BOTTOM	
		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
75 mph	48 s	3.94	4.93	3.91	5.42	0.45	0.37
80 mph	45 s	4.80	5.70	5.02	6.31	0.58	0.41
Perm. Set	60 s	0.54	0.75	0.69	0.90	0.14	0.10
90 mph	40 s	6.50	7.51	7.36	8.21	0.82	0.50
100 mph	36 s	8.37	9.42	8.65	10.15	0.83	0.56

Observation: *Specimen failed while attempting to sustain 115 mph.*

Maximum Sustained Wind Speed, V_{fm} = 100 mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\ ASD}$ = (1.05 x V_{fm}) + 10.5 = 116 mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\ ULT}$ = ($V_{3s,ASD} \div \sqrt{0.6}$) = 149 mph

Test No. 2
Test Date: 01/08/20

WIND SPEED	DURATION	MAXIMUM DEFLECTION (in)					
		TOP		MID		BOTTOM	
		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
75 mph	48 s	4.77	4.92	4.27	4.94	0.87	0.41
80 mph	45 s	5.37	6.02	4.78	6.32	0.91	0.45
Perm. Set	60 s	0.58	0.70	0.70	0.85	0.13	0.07
90 mph	40 s	6.73	7.73	7.52	8.32	1.16	0.56
100 mph	36 s	9.30	10.56	7.86	12.56	1.35	0.70

Observation: *Specimen failed while attempting to sustain 115 mph.*

Maximum Sustained Wind Speed, V_{fm} = 100 mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\ ASD}$ = (1.05 x V_{fm}) + 10.5 = 116 mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\ ULT}$ = ($V_{3s,ASD} \div \sqrt{0.6}$) = 149 mph

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TEST RESULTS (CONTINUED)

Test No. 3
Test Date: 01/08/20

WIND SPEED	DURATION	MAXIMUM DEFLECTION (in)					
		TOP		MID		BOTTOM	
		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
75 mph	48 s	4.32	4.64	3.99	4.56	0.71	0.32
80 mph	45 s	5.10	5.64	4.67	5.96	0.69	0.35
Perm. Set	60 s	0.68	0.73	0.60	0.74	0.14	0.06
90 mph	40 s	5.97	6.95	5.48	7.34	0.92	0.44
100 mph	36 s	6.50	8.60	6.46	10.90	0.94	0.57

Observation: *Specimen failed while attempting to sustain 115 mph.*

Maximum Sustained Wind Speed, V_{fm} = 100 mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\,ASD} = (1.05 \times V_{fm}) + 10.5 = 116$ mph
Equivalent 3-second Gust Wind Speed, $V_{3s,\,ULT} = (V_{3s,ASD} \div \sqrt{0.6}) = 149$ mph

SECTION 9
PHOTOGRAPHS

Photo No. 1
Wind Generator Outlet Relative to Test Specimen
Typical Dynamic Wind Load Setup

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Photo No. 2
Typical Failure of Fence Assemblies

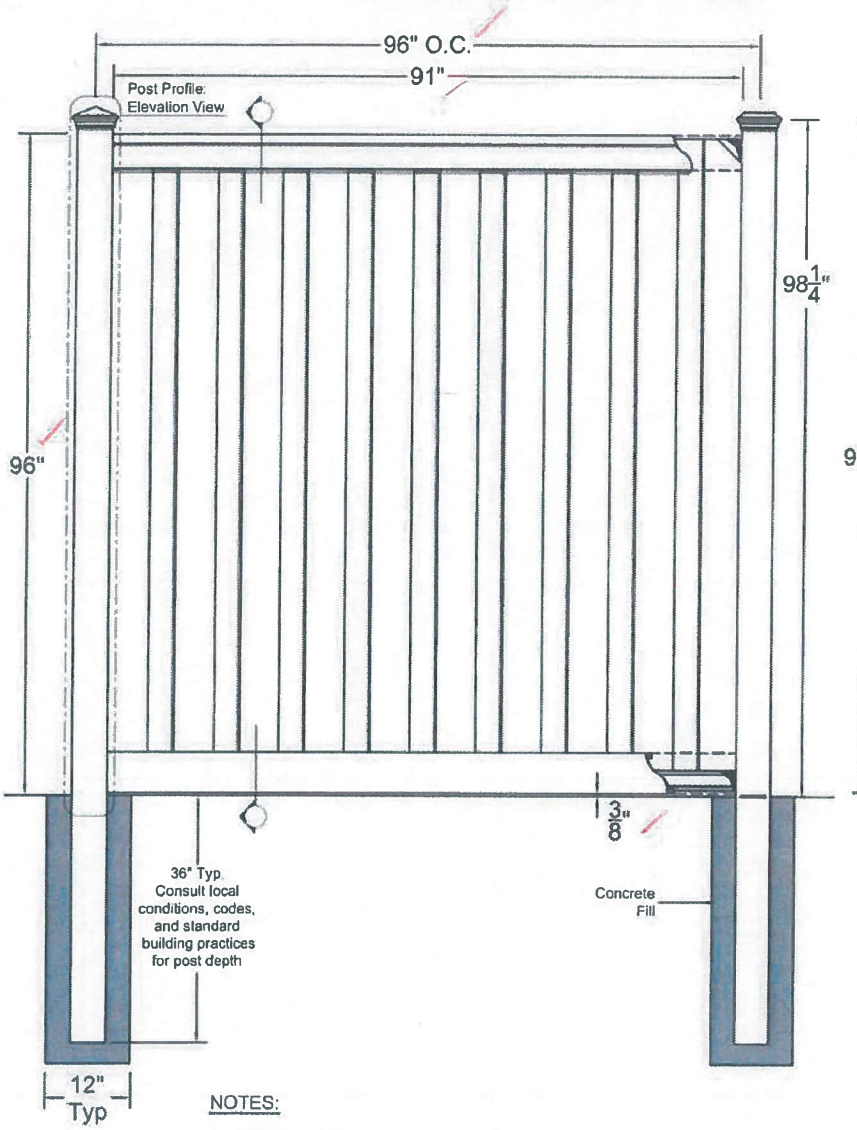
SECTION 10
DRAWINGS

The component and assembly drawings that follow for the Seclusions® wood-plastic composite privacy fence system 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.

Trex® Seclusions®

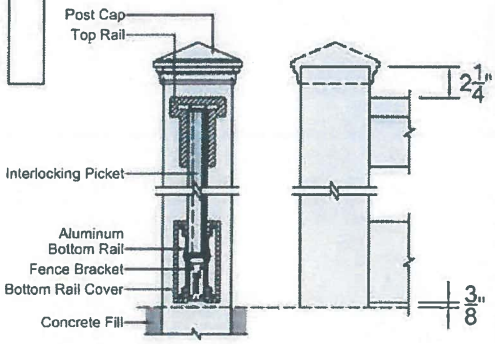
COMPOSITE FENCING SYSTEM

ARCHITECTURAL DRAWING:
TREX SECLUSIONS FENCING
8' TALL x 8' WIDE



COMPONENTS	QUANTITY	LENGTH
Post Cap: Pyramid, Flat, or Crown	1	
5" x 5" Post	1	144" *
4" x 4.9" Top Rail	1	91" *
1"x5.75" Interlocking Picket	19	91" *
1" x 5.75" Bottom Rail Cover	2	91" *
Aluminum Bottom Rail	1	90 1/2"
Fence Bracket	4	
1 5/8" (Typ) Exterior Wood Screws	24	

* Length may vary



Post Profile: Cut View / Elevation View

NOTES:

1. INSTALLATION TO BE COMPLETED PER MANUFACTURER'S SPECIFICATION.
2. THIS DRAWING IS PROVIDED FOR PLANNING PURPOSES. REFER TO MANUFACTURER'S INSTALLATIONS FOR CONSTRUCTION DETAILS.
3. REFER TO MANUFACTURER'S WEBSITE FOR PRODUCT INFORMATION.
4. DRAWING NOT TO SCALE.

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Test sample complies with these details.
Deviations are noted.

Report # K4991.02

Date 1/30/20 Tech

Publication date Jan 30, 2019

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SECTION 11
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	02/11/20	N/A	Original Report Issue
1	02/12/20	9-14	Added the Correct Drawings