TURNKEY PORCH ENCLOSURES

KEEP YOUR PORCH. LOSE THE ELEMENTS.

PERFORMANCE REPORT

Guard and Fall Protection

Oasis™ 4-Track Porch Enclosure System

Performance Referenced to ASTM E935 and ICC-ES AC273 Load Criteria

Submitted under VCC Section 112.2
Alternative Methods or Materials

Applicable Code: 2021 Virginia Residential Code (VRC)
Code Sections: VCC 112.2; VRC R301.5, Table R301.5, R312, R609.7, Appendix AH (AH101–AH106)
Performance References: ASTM E935, ICC-ES AC273

Revision C — November 2, 2026
Supersedes all earlier issues, including the April 23, 2026 issue

Prepared by: Turnkey Porch Enclosures, LLC
Engineer of Record: Clifton L. Parker, IV, P.E. — Virginia Engineering Services, LLC
Certification letter dated April 27, 2026 (appended)

Revision C. This revision aligns terminology, code citations, and cross-references with the Wind Load Classification Report, Rev C, defines the guard sash, and adds the R312.1.3 opening condition (Section 7.1.6). The load-performance data, geometric limits, and installation requirements certified by the Engineer of Record on April 27, 2026 are unchanged.

1.0 Evaluation Subject

1.1 Product: Oasis™ 4-Track Porch Enclosure System with integrated Fall Rail Assembly.

1.2 Manufacturer: Turnkey Porch Enclosures, LLC, 1209 Admiral Street, Richmond, Virginia 23220. Telephone: (804) 567-6543. Website: turnkeyporch.com.

1.3 Report prepared by: Turnkey Porch Enclosures, LLC.

1.4 Engineer of Record: Clifton L. Parker, IV, P.E., Virginia Engineering Services, LLC, 8124 Crown Colony Pkwy, Mechanicsville, Virginia 23116. Telephone: (804) 310-0398. Certification letter dated April 27, 2026, appended to this report.

1.5 This report is a manufacturer submittal under VCC Section 112.2 (Alternative Methods or Materials). It is not an ICC-ES Evaluation Report (ESR) and is not an ASTM-published test report. Turnkey Porch Enclosures does not currently hold an ICC-ES ESR for the Oasis™ system. ASTM E935 and ICC-ES AC273 are referenced as performance benchmarks only.

2.0 Evaluation Scope

2.1 This report evaluates the Oasis™ 4-Track Porch Enclosure System for compliance with the guard and fall protection provisions of the following codes:

Code / Section	Subject
2021 Virginia Residential Code (VRC)	Governing adopted code
VCC Section 112.2	Alternative Methods or Materials
VRC R301.5 / Table R301.5	Minimum design loads: guards and guard infill
VRC R312 (R312.1.2, R312.1.3)	Guards: height and opening limitations
VRC R609.7	Anchorage of assemblies to structure
VRC Appendix AH (AH101–AH106)	Patio Covers

2.2 Performance is additionally referenced to the load criteria of the following industry standards, presented as benchmarks for the Authority Having Jurisdiction:

Standard	Title
ASTM E935	Standard Test Methods for Permanent Metal Railing Systems and Rails for Buildings
ICC-ES AC273	Acceptance Criteria for Handrails and Guards (approved June 2017)

3.0 Properties Evaluated

3.1 The following structural and safety properties have been evaluated:

Property	Criterion / Code Reference
Guard top rail: concentrated load	200 lbf in any direction (R301.5, Table R301.5)
Guard top rail: deflection	L/240 (PE analysis); h/24 + l/96 mid-span horizontal (AC273 benchmark)
Guard infill: concentrated load	50 lbf over 1 ft² (R301.5, Table R301.5)
Guard height	36 in. minimum above finished floor (R312.1.2)
Panel-to-structure attachment	Fastener capacity and spacing (R609.7)
Guard infill continuity	Guard sash fixed by the Vent Lock below the fall rail; cannot be raised or removed (Section 5.2)

3.2 The following are outside the scope of this report: energy-code compliance, fire resistance, egress, and the structural capacity of the existing porch framing (columns, beams, roof, foundations), which must independently satisfy VRC Chapter 3. Wind behavior of the enclosure, including the guard sash, is addressed in the Wind Load Classification Report, Rev C, Section 5.

4.0 Uses

4.1 The Oasis™ 4-Track system is a removable, non-structural vinyl-panel porch enclosure system installed within existing roofed residential porches classified under VRC Appendix AH (Patio Covers).

4.2 Where the porch floor is more than 30 in. above adjacent grade, the system incorporates a dedicated fall rail assembly to satisfy the guard requirements of VRC R312.

4.3 The guard consists of the fall rail, which serves as the guard's top rail, and the Vent-Locked guard sash below it, which serves as the guard infill. The enclosure supplements the guard and does not replace it. The operable sashes are not part of the guard.

4.4 The system is not a fenestration product, not a structural wall, and not a sunroom. In high wind the operable sashes are fully opened or removed by the homeowner; the guard sash stays in place. High-wind operation and the wind behavior of the guard sash are addressed in the Wind Load Classification Report, Rev C, Sections 5.1 and 5.4.

4.5 The system is presented to the AHJ as an alternative method under VCC Section 112.2, so that a determination of equivalency can be made on the record.

5.0 Description

5.1 Fall Rail Assembly

Component	Specification
Material	Aluminum square tube, Duracron-finished
Cross-section	1-3/4 in. square, 3/32 in. wall thickness
Height	36 in. above finished floor
Maximum clear span (single)	60 in.
Maximum panel width (twin)	100 in. (two-span condition)
Mounting brackets	14 GA minimum steel, L-shaped, fastened to porch column
Primary fasteners	#10-16 self-drilling, carbon and stainless steel (Leland Industries)
Fastener tensile strength	2,430 lbs minimum
Fastener shear strength	1,460 lbs minimum
Twin center connection	#10 flat-head screws to vertical center support bar (I-track)

5.2 Vinyl Infill and Guard Sash

5.2.1 Each panel has three or four sashes. Each sash carries 10 mil (0.010 in.) flexible vinyl glazing and an integrated insect screen.

5.2.2 In fall-protection applications the innermost sash is the guard sash. The Vent Lock fixes it in its lowered position, below the fall rail; it cannot be raised or removed. The remaining sashes are operable for ventilation and are removable.

5.2.3 The guard sash carries no high-wind decal. Each operable sash carries the high-wind decal described in the Wind Load Classification Report, Rev C, Section 5.1.2.

5.2.4 The flexible vinyl glazing is retained within the aluminum extrusion by a proprietary high-tension vinyl-retention spline that distributes load uniformly along the panel perimeter.

5.3 Panel-to-Structure Attachment

5.3.1 Panels are secured to porch columns per the Turnkey Installation Instructions. Fasteners pass through the extrusion flange at spacing aligned with the horizontal sash bars, not exceeding 24 in. on center, with a minimum of 12 screws per panel. Satisfies VRC R609.7.

6.0 Installation

6.1 Installation must comply with this report and the Turnkey Porch Enclosures Installation Instructions. Where the instructions differ from this report, this report governs.

6.2 The fall rail must be installed at 36 in. above the finished floor using the 14 GA mounting brackets described in Section 5.1. Brackets are fastened to porch columns with the specified fasteners.

6.3 The Vent Lock must be installed on the guard sash (the innermost sash) of every panel in a fall-protection application to ensure continuous guard infill.

6.4 For twin enclosure installations, the fall rail must be additionally secured to the vertical center support bar (I-track) using #10 flat-head screws, maintaining a clear span of less than 60 in. Maximum twin panel width is 100 in.

6.5 Enclosure panels must be fastened to porch columns with a minimum of 12 #10-16 self-drilling screws per panel, spaced not more than 24 in. on center, aligned with the horizontal sash bars.

6.6 The compatibility of the fasteners with the supporting porch column material (wood, composite, masonry sleeve, or other) is the installer's responsibility and must be verified for the project-specific conditions.

7.0 Conditions of Use

7.1 The Oasis™ 4-Track Porch Enclosure System described in this report, when installed in accordance with Section 6.0 and within the geometric limits of Section 5.0, complies with the guard and fall protection requirements of VRC R301.5, Table R301.5, R312, and R609.7 of the 2021 Virginia Residential Code and is a suitable alternative to what is specified in those sections, subject to the following conditions:

7.1.1 Installation complies with this report and the manufacturer's installation instructions.

7.1.2 The existing porch structure (columns, beams, roof framing, connections) independently satisfies the applicable wind, snow, and live-load provisions of VRC Chapter 3.

7.1.3 The Oasis™ system does not upgrade, certify, or replace the structural capacity of the existing porch structure.

7.1.4 Fall rail clear span does not exceed 60 in. (single) or the equivalent two-span condition for twin enclosures (100 in. maximum panel width).

7.1.5 The Vent Lock is installed on the guard sash in every fall-protection application, and the guard sash carries no high-wind decal.

7.1.6 Openings in the guard, from the finished floor to the fall rail, do not allow passage of a 4 in. diameter sphere (R312.1.3). This is verified at installation and at inspection.

7.1.7 Installation does not deviate from the engineered details without written approval from the Engineer of Record. Deviations void the performance conclusions of this report.

7.1.8 This report addresses guard and fall protection performance only. Wind classification and high-wind operation are addressed in the Wind Load Classification Report, Rev C. Energy-code compliance, fire resistance, and egress are outside the scope of this report.

7.1.9 This report is not an ASTM E935 test report and is not an ICC-ES Evaluation Report (ESR). The supplemental in-house testing was performed at design-load levels, not at AC273 factored proof loads. Appendix A, Section A.7 lists all deviations.

7.1.10 Final determination of code compliance and applicability rests with the Authority Having Jurisdiction.

8.0 Evidence Submitted

8.1 The following documentation was reviewed or prepared in support of this report:

Ref.	Document	Source / Detail
8.1.1	Sealed engineering analysis	Klaus J. Worrell, P.E., VA Lic. #100094, dated November 9, 2023
8.1.2	Sealed engineering analysis	Kourosh Mechanic, P.E., MD Lic. #16290, dated September 12, 2024
8.1.3	Sealed engineering analysis	Cody Johnston, P.E. (BORJAG), NC Lic. #P-3097, dated September 9, 2025
8.1.4	Engineer of Record certification letter	Clifton L. Parker, IV, P.E., VA, dated April 27, 2026 (appended)
8.1.5	Supplemental verification test data	Turnkey Production QA, April 10, 2026 (Appendix A)
8.1.6	Fall Rail Installation Specifications	Turnkey Porch Enclosures (Attachments B and D)
8.1.7	Installation Instructions	Turnkey Porch Enclosures (Attachment B)
8.1.8	Vent Lock Product Specifications	Turnkey Porch Enclosures (Attachment A)
8.1.9	Flange and Fastener Details	Turnkey Porch Enclosures (Attachment C)
8.1.10	Wind Load Classification Report, Rev C	Turnkey Porch Enclosures, November 2, 2026 (companion report)

9.0 Identification

9.1 The Oasis™ 4-Track Porch Enclosure System is identified by the manufacturer's name (Turnkey Porch Enclosures, LLC), the product name (Oasis™ 4-Track), and the Duracron frame color (Tan/Khaki, White, or Black).

9.2 The fall rail assembly is identified by its aluminum square-tube cross section (1-3/4 in. × 1-3/4 in., 3/32 in. wall) and the 14 GA steel mounting brackets.

9.3 The manufacturer's contact information is: Turnkey Porch Enclosures, LLC, 1209 Admiral Street, Richmond, Virginia 23220. Telephone: (804) 567-6543. Website: turnkeyporch.com.

10.0 Performance Data

10.1 Performance Criteria Mapping (Code vs. AC273)

Table 10.1 maps the governing VRC load criteria alongside the comparable AC273 criteria and factored proof loads.

Load Case	VRC R301.5 (Governing)	AC273 Design Load	AC273 Factored Proof Load (SF)
Top rail concentrated	200 lbf any direction	200 lbf any direction	500 lbf (SF 2.5)
Infill concentrated (opaque)	50 lbf / 1 ft²	50 lbf / 1 ft²	125 lbf (SF 2.5)
Guard height	36 in. min. (R312.1.2)	Per code	—
Deflection: mid-span horizontal	Not prescribed (L/240 per PE analysis)	h/24 + l/96	At 200 lbf
Deflection: mid-span vertical	Not prescribed	l/96	At 200 lbf
Deflection: post	Not prescribed	h/12	At 200 lbf

Table 10.1 Performance Criteria Mapping

■ **Note on factored proof loads.** AC273 requires certified lab testing to factored proof loads (design load × SF). The sealed PE analyses demonstrate 60% stress utilization at 200 lbf and an infill safety factor of at least 4. In-house verification (Appendix A) was performed at design-load levels only. Appendix A, Section A.7 lists the deviations.

■ **Note on deflection.** The VRC does not prescribe guard deflection limits; L/240 is from the PE analyses. AC273 uses h/24 + l/96 (horizontal), l/96 (vertical), and h/12 (post). PE-documented deflections (0.0248 in. fixed / 0.124 in. pinned at a 60 in. span) are well below all three AC273 benchmarks.

10.2 Sealed Engineering Results

Criterion	Required	PE-Documented Performance	Status
Top rail, 200 lbf	200 lbf	60% of allowable stress at 200 lbf (60 in. span)	**PASS**
Top rail deflection	L/240 = 0.25 in.	0.0248 in. (fixed) / 0.124 in. (pinned)	**PASS**
Infill, 50 lbf / 1 ft²	50 lbf	Safety factor ≥ 4 (screen excluded)	**PASS**
Guard height (R312.1.2)	36 in.	36 in. above finished floor	**PASS**
Center-bar shear (twin)	Adequate for 200 lbf	Safety factor ≥ 3	**PASS**
Panel attachment (R609.7)	Per code	12+ screws, 24 in. o.c., 2,430 lbf tensile each	**PASS**

Table 10.2 Sealed Engineering Results vs. Code Requirements

11.0 Report Closure

11.1 This report is submitted in support of plan review and permit issuance under VCC Section 112.2. The complete package submitted with each permit application includes:

- Cover letter stating the jurisdiction's adopted ultimate design wind speed and its source
- This Guard and Fall Protection Performance Report, Rev C, with the appended Engineer of Record certification letter

- Wind Load Classification Report, Rev C
- Turnkey Installation Instructions and Attachments A through D
- Project drawings showing the guard sash and its height, fall rail location, bracket placement, panel geometry, porch floor height above grade, decal locations, and the AH103.1 open-area calculation
- High-Wind Operation Acknowledgment (Form TPE-HW-01), where the jurisdiction requires it
- Sealed engineering analyses listed in Sections 8.1.1 through 8.1.3, on request

Prepared by:

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For:

Authority Having Jurisdiction
Plan Review

End of Report Body. Supplemental verification test data, photographs, and deviation disclosures follow in Appendix A. The Engineer of Record certification letter dated April 27, 2026 follows Appendix A.

Appendix A — Supplemental In-House Verification Testing

> ! **Important.** The testing in this appendix is **supplemental field-shop verification only**. It is **not** certified ASTM E935 testing and was not performed by an accredited laboratory under ISO/IEC 17025. It is presented as corroborating evidence for the sealed engineering analysis, which remains the governing authority.

A.1 Test Specimen Record

Field	Value
Specimen ID	TPE-OA4T-FR-2026-04-10
System	Oasis™ 4-Track Porch Enclosure with Fall Rail
Configuration	Single enclosure, full-height frame, fall rail and brackets
Fall rail	1-3/4 in. aluminum square tube, 3/32 in. wall, 60 in. span
Vinyl infill	10 mil flexible vinyl glazing with screen, proprietary spline retention
Vent Lock	Installed on the guard sash (innermost sash)
Source	Production assembly, Turnkey manufacturing line
Test date	April 10, 2026
Test location	Turnkey facility, 1209 Admiral St, Richmond, VA
Tester	Turnkey Production QA
Observers	Turnkey Production QA staff
Ambient	Indoor, climate-controlled shop environment

Table A.1 Test Specimen Record

A.2 Apparatus and Calibration

Apparatus	Description	Calibration
Digital crane scale	300 kg (660 lbf) capacity, LCD readout	Mfr. accuracy ±1%; no third-party calibration certificate
Load-application strap	Nylon ratchet strap with carabiner	N/A (mechanical element)
Infill test weights	Two 25 lb hex dumbbells (50 lbf total)	Labeled weight; not independently verified

Table A.2 Apparatus and Calibration Status

A.3 Procedure

A.3.1 Top rail: strap fastened at mid-span (60 in. bracket-to-bracket), crane scale in series. Load applied progressively to the 200 lbf target and held until stabilized. Tested downward and upward.

A.3.2 Infill: panel laid flat, 50 lbf (two dumbbells) placed on a 1 ft² area at the panel center. Monitored for tearing, spline disengagement, and frame deformation.

A.3.3 Results are as read from the crane scale LCD at stabilized load or, for infill, observed at a sustained 50 lbf over at least 30 seconds with no failure.

A.4 Verification Test Photos

A.4.1 Top Rail, Downward (Target 200 lbf)



Fig. A.4.1-a: Downward load via crane scale



Fig. A.4.1-b: Scale reading 223.1 lbf

A.4.2 Top Rail, Upward (Target 200 lbf)



Fig. A.4.2-a: Upward load configuration



Fig. A.4.2-b: Scale 203.5 lbf



Fig. A.4.2-c: Scale 200.2 lbf

A.4.3 Infill, 50 lbf / 1 ft²



Fig. A.4.3-a: 50 lbf on infill center



Fig. A.4.3-b: Deflection, no failure

A.4.4 Bracket Detail and A.4.5 Vent Lock Detail

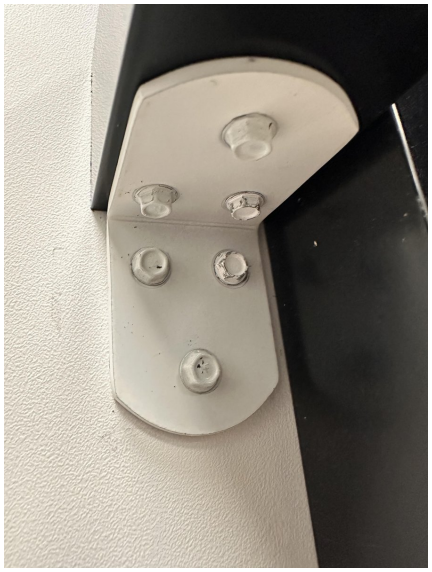


Fig. A.4.4: 14 GA fall rail mounting bracket at column connection



Fig. A.4.5: Vent Lock in the sash track, fixing the guard sash

A.5 Verification Test Log

ID	Component	Direction	Target	Measured	Observation	Fig.
VT-01	Top rail	Down	200 lbf	223.1 lbf	No deformation or failure	A.4.1
VT-02	Top rail	Up	200 lbf	203.5 lbf	No deformation or failure	A.4.2
VT-03	Top rail	Up	200 lbf	200.2 lbf	No deformation or failure	A.4.2
VT-04	Infill	Normal	50 lbf/ft²	50 lbf ≥ 30 s	Elastic deflection; no tearing, spline disengagement, or frame deformation	A.4.3

Table A.5 Verification Test Log (April 10, 2026)

A.6 Engineering-Predicted vs. Field-Verified

Criterion	Required	PE Predicted	Verified (Ref)	% Req.	Status
Rail, down	200 lbf	60% stress util.	223.1 (VT-01)	111.6%	**PASS**
Rail, up	200 lbf	Same envelope	203.5 (VT-02)	101.8%	**PASS**
Rail, up (repeat)	200 lbf	Same envelope	200.2 (VT-03)	100.1%	**PASS**
Infill, 1 ft²	50 lbf	SF ≥ 4	50 lbf (VT-04)	100%*	**PASS**
Deflection	L/240	0.0248 / 0.124 in.	Not measured	—	**PASS (PE)**

Table A.6 Predicted vs. Verified (infill at design load; PE analysis confirms SF ≥ 4)*

■ **Design load vs. factored proof load.** In-house loads are at design level (1×). AC273 requires 500 lbf (rail) and 125 lbf (infill) factored proof loads via a certified lab. Factored-load capacity is demonstrated analytically by the sealed PE analyses (60% stress utilization at 200 lbf; infill SF ≥ 4).

A.7 Deviations from AC273 Certified-Testing Protocol

Table A.7 identifies each deviation from the AC273 certified-testing protocol. This disclosure is made for a complete and transparent record.

AC273 Requirement	In-House Verification (this report)
Accredited independent lab (ISO/IEC 17025)	In-house by Turnkey Production QA. Not accredited.
Minimum 3 specimens (AC273 §4.2.2)	One production specimen.
Independent specimen selection (§2.4)	Pulled from production by Turnkey.
Factored proof loads: 500 lbf rail, 125 lbf infill	Design-load only: 200 lbf target rail, 50 lbf infill.
Calibrated load cell with third-party certificate	Crane scale, mfr. accuracy ±1%, no third-party certificate.
Deflection gauges at load point	Deflection not measured in-house (per PE analysis).
All 6 concentrated load cases (H/V at 3 positions)	Downward and upward at mid-span only.
Corner connections (§4.7)	Not tested. Linear porch openings typical.
Timed hold via stopwatch	Held until stabilized; ≥ 30 s for infill. Not precision-timed.
Temperature / RH recorded	Indoor shop. Specific values not instrumented.

Table A.7 Deviations from AC273 Protocol

! **Purpose.** These deviations are disclosed so the AHJ can distinguish between AC273 certified lab testing and the supplemental verification in this report. Code compliance is demonstrated by the sealed PE analyses (Section 8.0) under VCC Section 112.2. In-house verification is corroborative, not a substitute for sealed engineering or certified testing.

End of Report. Prepared by Turnkey Porch Enclosures, LLC. Engineer of Record: Clifton L. Parker, IV, P.E. (Virginia Engineering Services, LLC, Mechanicsville, Virginia). The Engineer of Record certification letter dated April 27, 2026 follows.

Virginia Engineering Services, LLC
8124 Crown Colony Pkwy, Mechanicsville, VA 23116
Phone: 804-310-0398
Email: vafoundationinspections@gmail.com
Website: https://www.vafoundationinspections.com/



Mr. Paul H. Keller, President Turnkey Enterprises, Inc.
1209 Admiral Street
Richmond, Virginia 23220

RE: GUARD AND FALL PROTECTION PERFORMANCE
OASIS™ 4-TRACK PORCH ENCLOSURE SYSTEM
TURNKEY PORCH ENCLOSURES, LLC COMMONWEALTH OF VIRGINIA

Dear Mr. Keller:

Per your request, I have reviewed the Oasis™ 4-Track Porch Enclosure System produced by Turnkey Porch Enclosures, LLC as an alternative to traditional railing and screening of a porch, providing the benefit of usable porch space at least three seasons of the year. I have also reviewed the Guard and Fall Protection Performance Compliance Report prepared by Turnkey Porch Enclosures (dated April 2026), the in-house supplemental verification test data contained therein, and the previously issued sealed engineering analyses by Klaus J. Worrell, P.E. (Virginia, November 9, 2023), Kourosh Mechanic, P.E. (Maryland, September 12, 2024), and Cody Johnston, P.E. (North Carolina, September 9, 2025). I concur with the findings and conclusions of those analyses.

Since the current approved code for residential construction in the Commonwealth of Virginia is the 2021 Virginia Residential Code (VRC), all references herein are to this code. Since the enclosure system is installed on a patio or porch that has a roof, the provisions of AH101 through AH106 in Appendix H of the Building Code apply and have been incorporated in this analysis.

The load analysis is in compliance with the provisions of R301.5, Table R301.5, R312, and R609.7 of the 2021 Virginia Residential Code. The performance documented herein is presented with reference to the load criteria of ASTM E935 and ICC-ES AC273, Acceptance Criteria for Handrails and Guards, as a performance benchmark for the Authority Having Jurisdiction.

Vinyl Infill System. The enclosure system is composed of three or four sashes (the polyvinyl film and the screen) with the innermost sash fixed in place as noted in the Vent Lock product attachment (Attachment A). The innermost sash cannot be raised or removed while the other sashes in the system can be operated for open air or placed in the closed position. The polyvinyl infill has been tested to withstand at least four times the required fifty pounds per square foot applied to a one-foot load area at the center of the panel; the benefit of the screen resistance has not been added to the analysis. The provisions of Table R301.5 are met by the system infill material since the load resistance exceeds the safety factor of four on the one-square-foot surface of the panel. This safety factor is consistent with

the AC273 factored proof-load requirement for infill (safety factor of 2.5 for opaque infill; 4.0 for glass infill).

Panel-to-Column Attachment. The second factor in the analysis is the securing of the porch enclosure panel to the main force-resisting system of the porch columns. It is here assumed that the porch columns have been properly sized and installed for the support of the porch roof system and are therefore in compression, which adds to the stability of the system frame connection. The enclosure is secured to the porch columns in accordance with the Turnkey Porch Enclosures Installation Instructions (Attachment B). Screws are installed through the flange (see Attachment C) with spacing to align with the horizontal sash bars and not to exceed twenty-four inches on center. A minimum of twelve screws per enclosure panel shall be installed. This installation method meets and exceeds the requirements of R609.7.

Fall Rail Assembly. The Fall Rail will be set at thirty-six inches above the finished floor and has been tested and designed to withstand the required loading of two hundred pounds in any direction on the rail with a maximum span of sixty inches. The Fall Rail, with a core of aluminum square tube of one and three-quarters inches with a wall thickness of 3/32□, without support from the movable panels, under full loading has a maximum stress in the aluminum spine of the horizontal rail (without the wood fill) of sixty percent of the allowable, and a design deflection of 0.0248□ (for fixed ends) or 0.124□ (for simple pinned ends) for the 60□ span (the allowable L/240 is 0.25□; the design limit for a simple span is based on a maximum of 60□). These deflection values also satisfy the AC273 serviceability criteria of h/24 + l/96 for mid-span horizontal deflection.

The system has also been designed and tested to withstand the required loading when installed using the 14 GA brackets described in the Fall Rail Installation Specifications (Attachments B and D). When installed on a twin enclosure installation, the fall rail shall be additionally secured to the structural vertical center bar (basic I-shape supporting the plastic side tracks with adequate space for the 1□ screw supporting the support bracket) of the unit using #10 flat-head screws, thus maintaining a clear span for the fall bar of less than the design sixty inches. The twin enclosure panel is limited to one hundred inches maximum for a two-span condition. The shear resistance of the #10 screw under the maximum two-hundred-pound load has a safety factor of at least three. The load requirements of R301.5 and Table R301.5 have been met.

Supplemental Verification. In addition to the analytical determination described above, I have reviewed the supplemental in-house verification testing documented in the Turnkey Guard and Fall Protection Performance Compliance Report. The in-house testing confirmed that the fall rail sustained loads of 200.2, 203.5, and 223.1 lbf in downward and upward directions without visible deformation or failure, and that the vinyl infill sustained 50 lbf over one square foot without tearing, spline disengagement, or frame deformation. These results are consistent with the analytical predictions and provide field-shop

corroboration of the design capacity. The in-house testing was performed at design-load levels and is not represented as certified ASTM E935 or AC273 laboratory testing.

Conclusion. This analysis allows for the grade of the porch floor to be greater than 30” as noted in Section R312 of the 2021 Virginia Residential Code. Based on my review of the system design, the sealed engineering analyses previously issued, and the supplemental in-house verification data, it is my professional opinion that the Turnkey Porch Enclosure System, when installed per the manufacturer’s instructions and within the geometric limits stated herein, is structurally sound and complies with the guard and fall protection requirements of Sections R301.5, Table R301.5, R312, and R609.7 of the 2021 Virginia Residential Code, as well as the applicable provisions of Appendix H (AH101 through AH106).

The performance of the system is consistent with the load criteria referenced in ASTM E935 and ICC-ES AC273, Acceptance Criteria for Handrails and Guards, and is submitted in support of alternative-methods approval under VCC Section 112.2.

For any questions, please contact me at 804.310.0398 or vafoundationinspections@gmail.com at any time. Virginia Foundation Inspections is (doing business as) Virginia Engineering Services, LLC. A Virginia Licensed Liability Company and registered business entity with the Virginia State Corporation Commission and the Virginia Department of Professional and Occupational Regulation.

VIRGINIA ENGINEERING SERVICES



By: _____

Name: Clifton L. Parker, IV, PE

Title: Professional Engineer

cc: File

