

Evaluation Report

GRT Structural Grate System

plus Insulation Board to Roofing-waterproofing on Concrete Deck

Manufacturer:

Greenrise Technologies

1500 Medical Center Pkwy, Suite 2A
Murfreesboro, TN 37129
615-907-7460 / info@greenrisetech.com

for

Florida Product Approval

FL 46910.4 R1

Florida Building Code 8th Edition (2023)

Per Rule 61G20-3

Method: 2 - B

Category: Roofing

Sub - Category: Roofing Accessories that are an Integral Part of the Roof System

Product: GRT Structural Grate System

Description: Insulated Paver system elevated above roof system

Support: Concrete Deck

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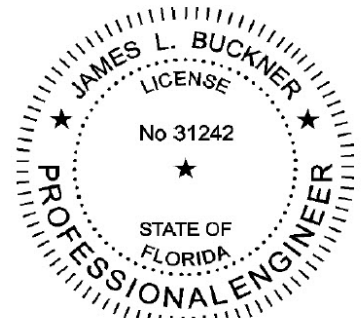
Prepared by:

James L. Buckner, P.E., SECB
Florida Professional Engineer # 31242
Florida Evaluation ANE ID: 1916
Report No. 04_25-722_Grate_HVHZ_ER8
(Revises Report No. 04_24-652_Grate_HVHZ_ER8)
Date: 03/23/2025

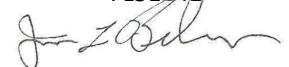
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FL31242



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CBUCK, Inc.

Phone: (561) 491-9927 · Email: cbuck@cbuckinc.net · Website: www.cbuckinc.net

Main Office: 1374 Community Drive., Jupiter, FL 33458

Manufacturer:	Greenrise Technologies
Product Name:	GRT Structural Grate System
Product Category:	Roofing
Product Sub-Category:	Roofing Accessories that are an Integral part of the Roofing System
Compliance Method:	State Product Approval Rule 61G20-3.005 (2) (b)
System Description:	GRT Structural Grate Systems are designed to create a stable and secure foundation on pedestals for artificial turf assemblies, green roof systems and planters and other applications. Multiple options are available and components are a made in the USA product.
Evaluated Models:	GRT Structural Grates – nominal 2' x 2' x 1.1 "
Evaluated Use:	Insulated Pedestal paver system elevated above roof membrane & concrete deck
Product Assembly as Evaluated:	Refer to Component Page of this report for product assembly components/materials & standards: Layers from Top to Bottom - GRT Structural Grate - mechanical connection to Pedestal - GRT Pedestals - adhered - Owen Corning Foamular NGX 600 insulation board - Adhered - Henry Company Waterproofing/Roofing Membrane -adhered to deck - Structural concrete deck - support for paver assembly
Support:	Type: Concrete Deck plus Henry Company Roofing NOA 19-0828.03 Description: <u>Deck Material:</u> Structural Concrete Compressive Strength: 2,500 psi. Minimum <u>Henry Company</u> , Henry Company 790-11, Rubberized asphalt waterproofing/roofing membrane per Miami-Dade NOA 19-0828.03 - System Type: F(1), Reinforced (or new NOA #, same system –“Henry A Carlisle Company”) (Design of support is outside the scope of this evaluation.)
System Slope:	Slope shall be in compliance with FBC Chapter 15 based on the type of roof covering, applicable code sections and in accordance with manufacturer’s recommendations.

Performance:**Wind Uplift Resistance:**

Full assembly load path vertical Uplift Resistance, Multiple 2' x 2' x Grates

Load Path = Top of Paver down to attachment to concrete deck

Pedestal maximum height evaluated in this report = 15 inches

Allowable Design Resistance

*Design Uplift Pressure:

- **105 PSF LB/Sq FT Pressure**

Supplemental Uplift Data:

*Design Capacity of one corner of paver
to top of pedestal connection

- **210 LB Force**

*Design Capacity bottom of pedestal load path
thru Insulation & Henry system
to the concrete deck

- **475 LB Force**

** Allowable design pressure(s) for allowable stress design (ASD) with a margin of safety of 2 to 1.*

Code Performance:

The following test protocol was performed to demonstrate compliance with the intent of the code:

- Modified TAS 114 Appendix D – Test Procedure for Simulated Uplift Pressure Resistance for a **Roof Assembly** (as defined in FBC 8th sec 1502 & 1513)
- Modifications to address load path components attached to both mechanically and adhered. HVHZ Authority per TAS 114 – D, section 4.2, to meet the intent of the HVHZ Protocol.
- Primary Code Basis = FBC 8th, sec 1708.2.
- Supporting code sections, used in analysis to meet the code intent and set the performance level, include HVHZ sec 1512.2.

Code Compliance:

The product described herein has demonstrated compliance with:
Florida Building Code 8th Edition (2023), per Section 1708.2
for use in the HVHZ and outside HVHZ.

**Evaluation Report
Scope:**

This product evaluation is limited to compliance with the structural requirements of the Florida Building Code, as related to the scope section of Florida Product Approval Rule 61G20-3.001.

**Components/Materials
(As Evaluated):****GRT Structural Grate**

Size: 23.5 in x 23.5 in x 1.1 in (nominal)
Material: A blend of nylon, glass and stabilizer
Weight: Weight 5.2 lbs per grate
Breaking Strength: Average > 1,000 PSF

GRT Pedestal & Kit

Materials: Pedestal - ID = GRT Fixed Head,
Adjustable Height : 1 – 15 inches
This Report Evaluated Pedestal Height = 15 inches max.
polypropylene blend,
Compressive Strength=> 3,000 PSF
other pieces -various materials

GRT Pedestal Base to Insulation Board

Adhesive: 3M™ Polyurethane Adhesive Sealant 550

Insulation Board: Owen Corning
Foamular NGX 600 (XPS) Rigid Foam Insulation
Extruded Polystyrene (XPS)
Thickness = 2 inch max.

Insulation Board to Henry membrane:

Adhesive: 3M™ Polyurethane Adhesive Sealant 550
Application 1/4" wide beads spread 6 inches apart

Membrane Waterproofing Roofing

Mfg; Henry Company
Description: **Henry 790-11,**
Rubberized asphalt waterproofing/roofing
Miami-Dade: **NOA 19-0828.03 - System Type: F (1) , Reinforced**
(or New NOA #, same system = Name change to:
"Henry A Carlisle Company")

Note: NOA Waterproofing Requires Field Flood Integrity Test, Per FBC 8th, (2023), section 1519.16.6 In accordance with ASTM D5957.

**Limitations and
Conditions of Use:****Scope of "Limitations and Conditions of Use" for this evaluation:**

- A copy of the Field Waterproofing integrity test report described herein the Miami-Dade waterproofing NOA # in this report, in accordance with Florida Building Code section 1519.16.6, ASTM D5957 shall be provided to the Building Official for review at time of final inspection.
Note "The flood test shall take place after the installation of the waterproofing and prior to the installation of any above membrane Paver components".
- Contractor shall submit to the Building Official for review the system specifications and details. Submission of these documents, as well as the proper application and installation of all materials shall be the sole responsibility of the contractor.
- All work shall be performed by a Contractor licensed to do roofing/waterproofing and be a Manufacturer Trained 'Qualified Applicator' approved by Henry Company. The Henry Company. shall supply a list of approved applicators to the authority having jurisdiction.
- All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform with Roofing Application Standard
- RAS 111 and the wind load requirements of applicable Building Code.
- All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

Material Labeling:

- Greenrise products listed herein shall be identified, on products and/or containers/packaging, with the Florida product approval number and the manufacturer's name or logo, per the intent of code section 1523.5 and Rule 61G20-3.
- Owens Corning product model – Foamular NGX 600 (XPS) Rigid Foam Insulation, shall be identified on containers/packaging, with the manufacturer's name or logo and product identification, per the intent of code section 1523.5 and Rule 61G20-3.
- 3M™ Company product - 3M™ Polyurethane Adhesive Sealant 550, shall be identified on containers/packaging, with the manufacturer's name or logo and product identification, per the intent of code section 1523.5 and Rule 61G20-3.
- Henry Company waterproofing roofing system, NOA 19-0828.03, System Type F(1), Reinforced, shall be Labeled per the NOA..
(or new NOA #, same system – "Henry A Carlisle Company")

Editorial suggestions by this report Evaluator:

The **Contractor** is advised to retain wrappers & containers with Labeling information and/or dated photo documentation, described above, during the project construction phase, for review/inspections by the Authority Having Jurisdiction.

The **Building Owner** is advised to retain envelope Florida Product Approval & NOA reports, along with labeling documentation for use in cost determinations for insurance coverage. Also the Florida programs for insurance discounts & credits for wind mitigation items. Good documentation is important to benefit from these programs.

- Refer to the last page of the referenced Miami-Dade NOA's for additional "General Limitations" that are a part of this evaluation report.
- The Scope of this evaluation is limited to structural vertical uplift properties.
- Design of support system is outside the scope of this report. Deck shall be in compliance with applicable building code.
- Fire Classification is outside the scope of Rule 61G20-3, and is therefore not included in this evaluation. refer to a current Approved Roofing Materials Directory for fire ratings of this product.
- This evaluation report approves the product assembly as described in this report for use in the High Velocity Hurricane Zone (HVHZ) code section. (Dade & Broward Counties)
- Scope of "Limitations and Conditions of Use" for this evaluation:
This evaluation report for "Optional Statewide Approval" contains technical documentation, specifications and installation method(s) which include "Limitations and Conditions of Use" throughout the report in accordance with Rule 61G20-3.005. Per Rule 61G20-3.004, the Florida Building Commission is the authority to approve products under "Optional Statewide Approval".
- Option for application outside "Limitations and Conditions of Use"
Rule 61G20-3.005(1)(e) allows engineering analysis for "project specific approval by the local authorities having jurisdiction in accordance with the alternate methods and materials authorized in the Code". Any modification of the product as evaluated in this report and approved by the Florida Building Commission is outside the scope of this evaluation and will be the responsibility of others.

Quality Assurance

The manufacturer has demonstrated compliance of roof paver products in accordance with the Florida Building Code and Rule 61G20-3.005 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through:

Nemo Cert, LLC (INSPECT) (FBC Organization ID# QUA12361).

Referenced Data:

1. TAS 114-11 Appendix D, Uplift Resistance Test
By Atlantic Caribbean Roof Consulting, LLC.
(FBC Organization #TST ID: 4671)
Report #: ACRC 22-020, Date: 08 / 18 /21
Report #: ACRC 21-0220, Date: 01/05/23
TAS 114-11 Appendix D, Modified Force Uplift Resistance Test
2. Quality Assurance
Nemo Cert, LLC (INSPECT) (FBC Organization ID# QUA12361)
3. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)

Properties: ASTM D635-14 Standard Test Method
by PRI Construction Materials Technologies LLC
(FBC Organization #TST ID: 5878)
Project No.: 2331T0008 Date Dec 2,2021

Installation**Installation Method:**

- Surface Preparation:
The surface intended to be adhered to must be clean, dry and free of all dirt and contaminants.
Refer to Refer to additional details within this report

Installation shall comply with this report, applicable code sections of FBC 8th Edition (2023) subject to the Limitations and Conditions of Use listed in this Evaluation Report and manufacturer's installation instructions as a supplemental guide for attachment.

Installation Method

The GRT Structural Grate is set over the top of the GRT Pedestals at every corner, and fastened with GRT Fastening Kit (two 1-1/2" x 3/16" washer and a screw) to the top head of the GRT pedestals.

GRT Pedestals bottom base is fully adhered to the top of Owens Corning Foamular 600 board with 3M™ Polyurethane Adhesive Sealant 550

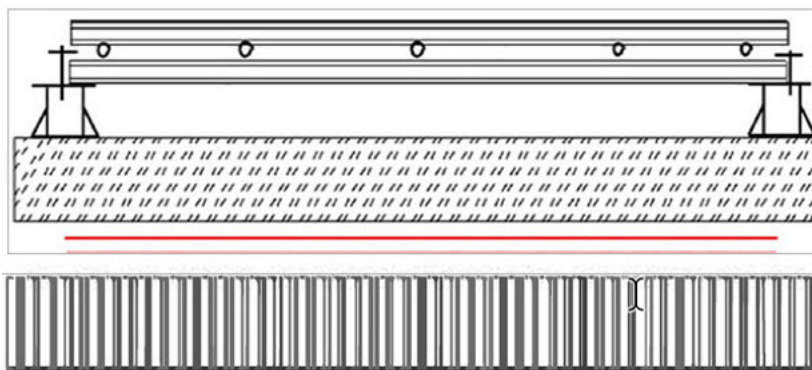
Applied at rate of 5.0 fl. Oz. per pedestal (~ 1/4 inch thick)

Owens Corning Foamular 600 Extruded Polystyrene Insulation board bottom is adhered to the top of the Henry Protection Course using

3M™ Polyurethane Adhesive Sealant 550,
applied in 1/4 inch wide beads spaced 6 inches apart.

HENRY modifiedPlus G100s/s Protection course set in hot 790-11 Rubberized asphalt applied at a rate of 125 mil thick over a reinforcing Henry Polyester Fabric set in 790-11 hot Rubberized asphalt base course, applied at a rate of 90 mil thick over the primed concrete deck.

Structural concrete deck primed with Henry 910-01 Asphalt Primer.



GRT Structural Grate
GRT Pedestal
3M 550
Owens Corning Insulation Board
3M 550
Henry Waterproofing/Roofing
Concrete Deck

Waterproofing/Roofing: Henry 790-11 System Type: F (1) Reinforced - NOA 19-0828.03 -
(or New NOA #, same system = Name change to: "Henry A Carlisle Company")

Refer to manufacturer's installation instructions for additional information