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ENGINEER

TEST

CONSULT

**P.E. EVALUATION REPORT (PEER)
FOR HURRICANE AND TORNADO SHELTER PERFORMANCE**

[Performance Roof Systems, Inc.](#)

A SOPREMA Group Company

4800 Dr. Martin Luther King Jr. Blvd.

Kansas City, MO 64130

(816) 921-0221

PEER-SOP-010.A.R1

Date of Issuance: 02/22/2023

Revision 1: 03/04/2024

SCOPE:

The documentation submitted has been reviewed by Robert Nieminen, P.E. for use of the product under [2020 ICC 500](#) ICC/NSSA Standard for the Design and Construction of Storm Shelters.

DESCRIPTION: Derbigum APP Modified Bitumen Roof Systems for use on Hurricane and Tornado Shelters

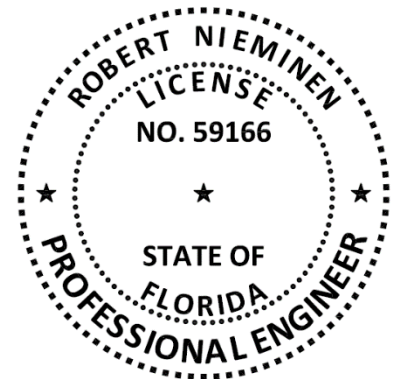
LABELING: Labeling shall be in accordance with the requirements of the Accredited Quality Assurance Agency noted herein.

CONTINUED COMPLIANCE: This PEER is valid until such time as the named product(s) changes, the referenced Quality Assurance or production facility location(s) changes, or Code provisions that relate to the product(s) change. Acceptance of our PEERs by the named client constitutes agreement to notify NEMO ETC, LLC of any changes to the product(s), the Quality Assurance or the production facility location(s).

ADVERTISEMENT: "NEMO P.E. Evaluated" may be displayed in advertising literature. If any portion of the PEER is displayed, then it shall be done in its entirety.

INSPECTION: Upon request, a copy of this entire PEER shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

Prepared by:



CERTIFICATION OF INDEPENDENCE:

1. NEMO ETC, LLC does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates.
2. NEMO ETC, LLC is not owned, operated or controlled by any company manufacturing or distributing products it evaluates.
3. Robert Nieminen, P.E. does not have nor will acquire, a financial interest in any company manufacturing or distributing products for which the PEERs are being issued.
4. This is an evaluation of specific products to a specific standard. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this PEER, or previous versions thereof, is/was used for permitting or design guidance unless retained specifically for that purpose.

ROOFING SYSTEMS EVALUATION:
1. SCOPE:

NEMO Product Category: Modified Bitumen
NEMO Format: Roll Goods
Compliance Statement: **Derbigum APP Modified Bitumen Roof Systems**, as produced by **Performance Roof Systems, Inc.**, have demonstrated compliance with [2020 ICC 500](#) ICC/NSSA Standard for the Design and Construction of Storm Shelters requirements for use on hurricane and tornado shelters. Compliance is subject to the [Installation Requirements](#) and [Limitations of Use](#) set forth herein.

2. STANDARDS:

CODE	SECTION	PROPERTY	STANDARD
2021 International Building Code®	202, 423.2	Impact resistance	ICC 500
2024 International Building Code®	202, 423.2	Impact resistance	ICC/NSSA 500
2020, 2023 Florida Building Code	202, 423.1, 453.25.4	Impact resistance	ICC 500

3. REFERENCES:

ENTITY	EXAMINATION	REFERENCE	DATE
NEMO etc. (IAS TL199)	ASTM E1886 per ICC-500	4g-SOP-22-LSIMP-02.C	01/04/2023
NEMO etc. (IAS TL199)	ASTM E1886 per ICC-500	4g-SOP-23-LSIMP-01.A	02/15/2024
UL, LLC. (IAS AA-668)	Quality Assurance	Service Confirmation (MO)	04/16/2019

4. PRODUCT DESCRIPTION:

- 4.1 This PEER covers **Derbigum APP Modified Bitumen Roof Systems** installed in accordance with **Performance Roof Systems'** published installation instructions, subject to the [Limitations of Use](#) herein.

TABLE 1: EVALUATED MEMBRANES

TYPE	PRODUCT	MATERIAL STANDARD			PLANT(S)
		REFERENCE	TYPE	GRADE	
BASE PLY AND PLY MEMBRANES	Derbigum GP	ASTM D6223	I	S	MO
	Derbigum GP-FR	ASTM D6223	I	S	MO
	Derbigum XPS	ASTM D6223	II	S	MO
	Derbigum XPS-FR	ASTM D6223	II	S	MO
CAP PLY MEMBRANES	Derbicolor GP	ASTM D6223	I	G	MO
	Derbicolor GP-FR	ASTM D6223	I	G	MO
	Derbicolor GP-FR CR	ASTM D6223	I	G	MO
	Derbicolor XPS	ASTM D6223	II	G	MO
	Derbicolor XPS-FR	ASTM D6223	II	G	MO
	Derbicolor XPS-FR CR	ASTM D6223	II	G	MO

5. LIMITATIONS:

- 5.1 This is an evaluation of specific products to a specific standard. Neither NEMO ETC, LLC nor Robert Nieminen, P.E. are, in any way, the Designer of Record for any project on which this PEER, or previous versions thereof, is/was used for permitting or design guidance. PEERs are not to be construed as representing any attributes not specifically listed, nor are PEERs to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by Robert Nieminen, P.E. or NEMO ETC, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.
- 5.2 This PEER covers use of the subject product on Hurricane Storm Shelters, and does not purport to evaluate for use on Tornado Storm Shelters or Emergency Shelters.
- 5.3 This PEER does not include evaluation of wind resistance. Refer to research reports or certification listings from approved sources, such as [Florida Product Approvals](#), [Miami-Dade NOAs](#), FM [RoofNav](#) Listings or UL [TGIK.R13327](#) Listings.
- 5.3.1 Roof assemblies shall be designed using design wind speeds set forth in ICC-500, and be tested to minimum 1.2 times design pressure.
- 5.4 This PEER does not include evaluation of fire classification. Refer to UL [TGFU.R13327](#) certification listings for external fire classifications.
- 5.5 Refer to [Table 3A](#) and [Table 3B](#) for systems having met ICC 500 impact resistance requirements for use on Hurricane Storm Shelters and Tornado Storm Shelters, respectively.
- 5.6 The products in [Section 4](#) are produced under an in-house quality control program which is under surveillance by a third-party quality assurance entity in accordance with [IBC Section 104.4 and 110.4](#). For components listed in Table 3A and Table 3B produced by a Manufacturer other than the report holder, refer to the approvals held by the component manufacturer.

6. INSTALLATION:

- 6.1 **Derbigum APP Modified Bitumen Roof Systems for use on Hurricane and Tornado Shelters** shall be installed in accordance with **Performance Roof Systems'** published installation instructions, subject to the [Limitations of Use](#) herein.
- 6.1.1 Unless otherwise noted, sub-assembly components may be adhered or mechanically attached.

TABLE 2: MEMBRANE / ADHESIVE COMBINATIONS			
REFERENCE	LAYER	MATERIALS	APPLICATION
APP-TA	Base Ply or Ply:	Derbigum GP, Derbigum GP-FR, Derbigum XPS or Dergigum XPS-FR	Torch-Applied, Full Bond
	Cap Ply:	Derbicolor GP, Derbicolor GP-FR, Derbicolor GP-FR CR, Derbicolor XPS, Derbicolor XPS-FR or Derbicolor XPS-FR CR	

TABLE 3A: IMPACT RESISTANT ASSEMBLIES PER ICC-500 HURRICANE STORM SHELTERS							
SHELTER TYPE:		Hurricane					
SURFACE TYPE:		Horizontal (roof)					
Missile size:		9 lb 2x4					
Design Wind Speed:		220 mph					
Missile speed:		0.10 x design wind speed = 22 mph					
Criteria 1:		No missile penetration through deck, per ICC-500					
Criteria 2:		No missile penetration through roof cover					
SYSTEM NO.	DECK	INSULATION (NOTE 6.1.1)	COVERBOARD (NOTE 6.1.1)	BASE SHEET	ROOF COVER (TABLE 2)		
					BASE PLY	PLY	CAP PLY
1	Min. 22 ga., Type B, Grade 40 steel at min. 6 ft span or structural concrete	Min. 1.5-inch Derbiboard	Min. 0.25-inch SOPRABOARD	None	APP-TA	(Optional) APP-TA	APP-TA
2	Min. 22 ga., Type B, Grade 40 steel at min. 6 ft span or structural concrete	Min. 1.5-inch Derbiboard	Min. 0.5-inch G-P Gypsum "DensDeck Prime", National Gypsum "DEXcell FA Glass Mat Roof Board or USG "SECUROCK Gypsum-Fiber Roof Board"	None	APP-TA	(Optional) APP-TA	APP-TA
3	Min. 22 ga., Type B, Grade 40 steel at min. 6 ft span or structural concrete	Min. 1.5-inch Derbiboard	Min. 7/16-inch National Gypsum "DEXcell Cement Roof Board	None	APP-TA	(Optional) APP-TA	APP-TA

TABLE 3B: IMPACT RESISTANT ASSEMBLIES PER ICC-500 TORNADO STORM SHELTERS									
SHELTER TYPE:		Tornado							
SURFACE TYPE:		Horizontal (roof)							
Missile size:		15 lb 2x4							
Design Wind Speed:		250 mph							
Missile speed:		67 mph							
Criteria 1:		No missile penetration through deck, per ICC-500							
Criteria 2:		No missile penetration through secondary roof cover							
SYSTEM NO.	Deck*	SECONDARY MEMBRANE (TABLE 2)		INSULATION	COVERBOARD	PRIMER	PRIMARY ROOF COVER (TABLE 2)		
		BASE PLY	CAP PLY				BASE PLY	PLY	CAP PLY
T-1.	structural concrete	APP-TA	APP-TA	Min. 2-layers, min. 2-inch Derbiboard, fully or partially adhered	Min. 0.625-inch G-P Gypsum "DensDeck Prime", National Gypsum "DEXcell FA Glass Mat Roof Board" or USG "SECUROCK Gypsum-Fiber Roof Board", fully or partially adhered	(Optional) ASTM D41	APP-TA	(Optional) APP-TA	APP-TA

* The as-tested condition consisted of Min. 4-inch thick, min. 7,000-psi cast-in-place concrete with #3 reinforcing bars at 6-inch o.c. in both directions. The structural concrete deck shall be designed and installed such that it can withstand the impact energy requirements of ICC-500 to the satisfaction of the Authority Having Jurisdiction.

7. BUILDING PERMIT REQUIREMENTS:

As required by the Building Official or Authority Having Jurisdiction to properly evaluate the installation of this product.

8. MANUFACTURING PLANTS:

Refer to [Section 4](#) herein for products and production locations having met codified material standards.

- END OF PEER -