VSE Project Number: U4120.0068.221

June 30, 2022

Design4PV
ATTENTION: Kostiantyn Negoda
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Tallinn, EE-37 15551 Estonia, 0 15551

REFERENCE: Extra Space Storage #1068 Building: 1880 North State Road 7, Margate, FL 33063
Solar Array Installation

To Whom It May Concern:

We have reviewed the existing structure at the above referenced site. The purpose of our review was to determine the adequacy of the existing structure to support the proposed installation of solar panels on the roof as shown on the panel layout plan.

Based upon our review, we conclude that the existing structure is adequate to support the proposed solar panel installation.

Design Parameters

Code: 2020 Florida Building Code - Building, 7th Edition (2018 IBC)
Risk Category: II
Design wind speed, Vult: 170 mph (3-sec gust)
Wind exposure category: C

Connection to Roof

Ballast system: designed by others. Maximum PV system weight including the ballast shall not exceed 7.8 psf.

Conclusions

Based upon our review, we conclude that the existing structure is adequate to support the proposed solar panel installation. In the area of the solar array, other live loads will not be present or will be greatly reduced (2020 FBC - Building, Section 1607.12.5). The gravity loads, and thus the stresses of the structural elements, in the area of the solar array are either decreased or increased by no more than 5%. Therefore, the requirements of Section 807.5 of the 2020 FBC - Existing Building are met and the structure is permitted to remain unaltered.

The solar array will be low-profile (no more than 18" above the roof surface). Thus, we conclude that any additional wind loading on the structure related to the addition of the proposed solar array is negligible. Increases in lateral forces less than 10% are considered acceptable. Thus the existing lateral force resisting system is permitted to remain unaltered.

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Limitations

Installation of the solar panels must be performed in accordance with manufacturer recommendations. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. The contractor must notify Vector Structural Engineering, LLC should any damage, deterioration or discrepancies between the as-built condition of the structure and the condition described in this letter be found. The use of solar panel support span tables provided by others is allowed only where the building type, site conditions, site-specific design parameters, and solar panel configuration match the description of the span tables. The design of the solar panels, solar racking (mounts, rails, ballast, etc.) and electrical engineering is the responsibility of others. Waterproofing around the roof penetrations is the responsibility of others. Vector Structural Engineering assumes no responsibility for improper installation of the solar array. Vector Structural Engineering shall be notified of any changes from the approved layout prior to installation.

VECTOR STRUCTURAL ENGINEERING, LLC
FL Firm License: COA 26626

Jacob S Proctor

Digitally signed by Jacob S Proctor
Date: 2022.06.30 14:38:50 -06'00'

06/30/2022

Jacob Proctor, P.E.
FL License: 74277 - Expires: 02/28/2023
Project Engineer

This item has been digitally signed and sealed by Jacob Proctor on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Enclosures

JSP/isa

JOB NO.: U4120.0068.221
SUBJECT: GRAVITY LOADS

PROJECT: Extra Space Storage #1068 Building

GRAVITY LOADS

Roof Pitch: 1.0 :12

ROOF DEAD LOAD (D)	Design material weight [psf]	Increase due to pitch	Material weight [psf]
Membrane	2.0	1.00	2.0
1/2" Plywood	1.0	1.00	1.0
Framing	3.0		3.0
Insulation	0.5		0.5
1/2" Gypsum Clg.	2.0	1.00	2.0
M, E & Misc	1.5		1.5
Total Existing Roof DL	10.0		
PV Array DL	7.9	1.00	8

ROOF LIVE LOAD (Lr)

Existing Design Roof Live Load [psf]	20	ASCE 7-16 Table 4.3-1
Roof Live Load With PV Array [psf]	0	2020 FBC - Building, Section 1607.12.5

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SUBJECT: LOAD COMPARISON

PROJECT: Extra Space Storage #1068 Building

Summary of Loads

	Existing	With PV Array
D [psf]	10	18
Lr [psf]	20	0
S [psf]	0	0

Maximum Gravity Loads:

	Existing	With PV Array	
D + Lr [psf]	30	18	ASCE 7-16, Section 2.4.1
D + S [psf]	10	18	ASCE 7-16, Section 2.4.1

Maximum Gravity Load [psf]:	30	18

Ratio Proposed Loading to Current Loading: **60%** **OK**

The gravity loads, and thus the stresses of the structural elements, in the area of the solar array are either decreased or increased by no more than 5%. Therefore, the requirements of Section 807.5 of the 2020 FBC - Existing Building are met and the structure is permitted to remain unaltered.