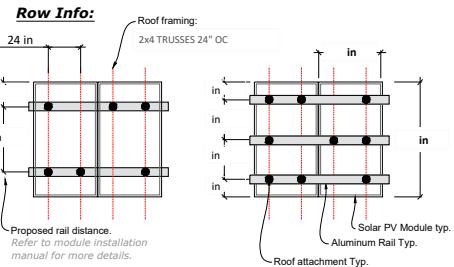


Project: :: Address: ::
STRUCTURAL CALCULATIONS

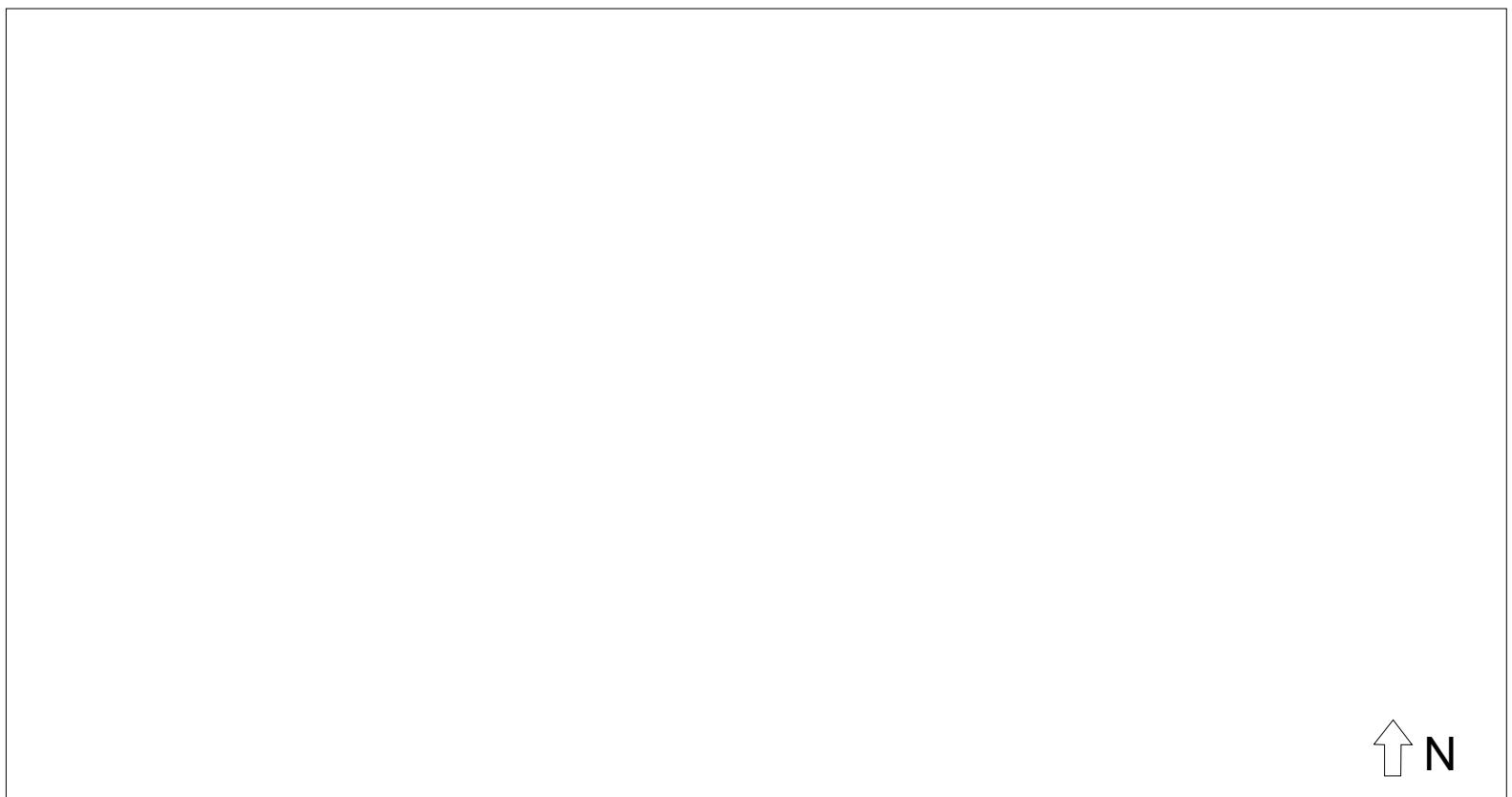
EXISTING ROOF SPECS	
Existing roof	
Total roof area	
Total photovoltaic area	
Mean roof height	
Roof Slope	
SOLAR PV STRUCTURAL SPECS	
Total number of modules	
Total roof mounts	
Solar PV module	
Solar PV Racking	UNIRAC SD
Points of connections per module	4
Aluminum rails per module	2
Pourable Sealant	
Base Sealant	



Typical 2-Rail system

Typical 3-Rail system

ARRAY AND ROOF PLAN



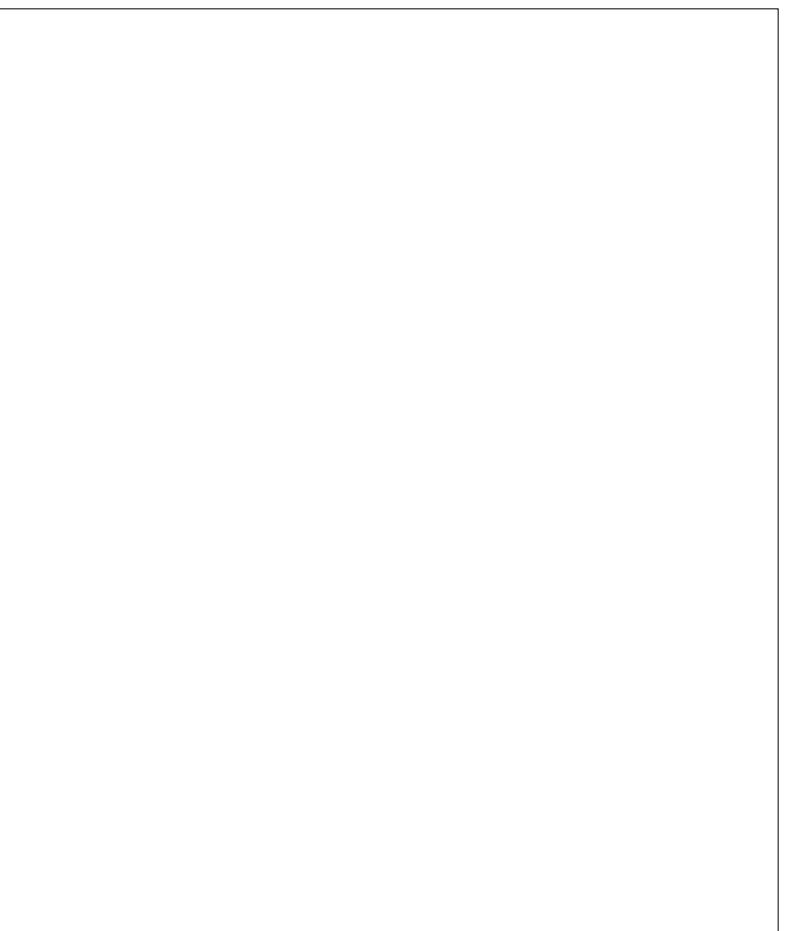
STRUCTURAL NOTES

- Install mid clamps between modules and end clamps at the end of each row of modules.
- Cantilever length shall not exceed 33% of the allowable span distance and shall never be greater than 16 inch.
- Aluminum Rails should always be supported by more than one footing on both sides of the splice.
- For any electrical connections between PV components refer to E-2.
- All elements in Roof plan **will be NEW** unless specified as "**EXISTING**".
- Per 690.34 Junction boxes located behind modules or panels shall be installed in a way that the wiring contained in them can be rendered accessible directly or by displacement of a module(s) secured by removable fasteners and connected by a flexible wiring system.
- Electrical conduits could be installed inside the building by using flexible metal conduits or outside the building by using PVC SCH80 conduits unless otherwise specified in E-1.
- The Installation of the solar PV System on the existing roof will not adversely affect the building structure under normal conditions and during a hurricane event of the FBC 2023 specified intensity.
- Existing building structure will safely accommodate lateral and uplift wind forces, as well as equipment dead load.
- Project compliant with FBC 2023 (8th Edition)

WIND CALCULATIONS

Wind Load Calculations		
Velocity Pressure (ASCE 7-16 (26.10.2))		
$Q = 0.00256 Kz Kt Kd V^2$ (lb/sq ft)		
Exposure category		
Kz (Velocity pressure exposure)		
Kt (Topographic factor)		
Kd (Wind directionality factor)		
V (Wind Speed)		
Mean height		
Oz (Velocity pressure)		
Applying ASD Design Load Factor (0.6)		
Design Wind Pressures (ASCE 7-16 (29.4.4))		
$p = qh (GCp)(Fe)(Fa)$ (lb/sq ft) (N/sq meter)		
Effective wind area (ASCE 7-16 (26.2))		
Component	Area (sq ft)	
Smaller Solar Array and Racking		
Mounts		
Array Edge Factor (Fe) (ASCE 7-16 (29.4.4))		
Exposed Array		
Non-Exposed Array		
Conditions of Array Edge Factor = 1.5		
Distance (d1) from roof edge > 0.5h	Distance (d1) to adjacent array > 4 ft or Distance (d2) to next adjacent panel > 4 ft	
Solar Array Pressure Equalization factor (Fa) (ASCE 7-16 (29.4.8))		
Effective Wind Area = 21 sqft	Fe = 0.62	
External Pressure Coefficient (GCp) (ASCE 7-16 Figure 30.3-2A to 2I)		
Solar array		
Zones	Uplift	Downward
1		
2		
3		
0		
Solar Attachments		
Zones	Uplift	Downward
1		
2		
3		
0		
Dead load of the critical row		
Components	Weight/ Unit	#
Solar module		
Micro-inverters		
Rails		
Mounts		
Total Weight		
Total Area		
Dead Load		
Wind Load for Effective Area = 1 sqft		
Total Design Load on Mounts		
Mounts load calculations		
Solar modules in critical row		
Total area		
Wind load		
Total wind load		
Total mounts in critical row		
Tension force per mount required		
Lag bolt out calculation		
Spruce, Pine, Fir		
SS lag bolt 5/16" thread depth		
Pull out strength per mount (2 lag bolt)		
Max. Pull out strength required per bolt		

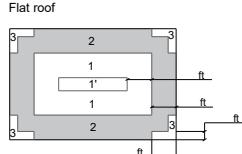
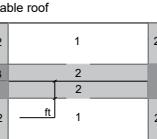
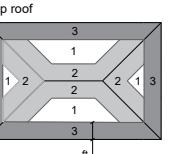
ATTACHMENT DETAIL



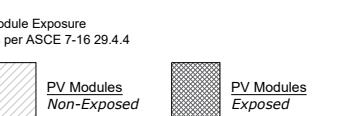
WIND ZONES

Width of Zones as per ASCE 7-16 FIGURE 30.3-2A to 2I:	
Least horizontal dimension	ft
10% of the least horizontal dimension	ft
Building mean roof height	ft
40% of the height of building	ft
Selected Zones width:	ft
Highest Pressure Zone Selected for Calculations	

Design with multiple type of roofs (Gable, Hip, and/or Flat):
Calculations are based on the type of roof that yield the highest net External Pressure Coefficient (GCp)

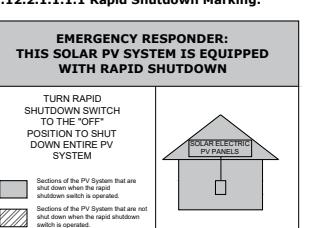


Legend:



MARKING REQUIRED BY NFPA 1 (2021) section 11.12.2.1

11.12.2.1.1 Rapid Shutdown Marking.



The label shall be reflective, with all letters capitalized and having a minimum height of 3/8 in, white on a red background.
The rapid shutdown label shall be located on or no more than 3 ft (1m) from the service disconnecting means to which the PV System are connected, and the label shall indicate the location of the rapid shutdown switch if it is not at the same location.

Project: :: Address: ::
STRUCTURAL CALCULATIONS



American Solar Installation Company LLC.
3241 NW 38th St., Suite 3304
Miami, FL 33182
Phone: 786-292-3304
305-267-0700

SEAL:

ENGINEER OF RECORD:
EDUARDO RODRIGUEZ VELAZQUEZ P.E. LICENSE #91287
13470 NW 8th St. Miami, FL 33182. TEL (786) 556-5574

DATE:

SCALE: NTS

DRAWN BY: ASIC ENG

PAGE:

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