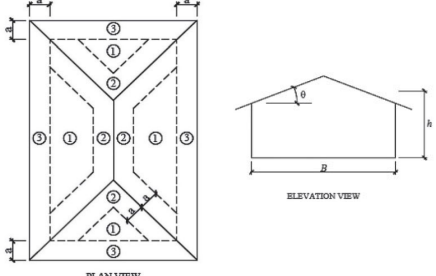
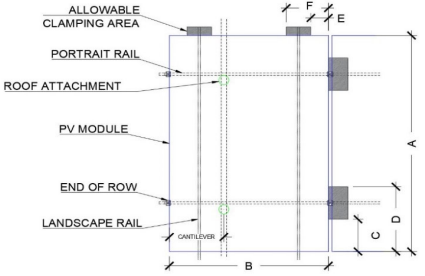


Roof Structure Details				Bailey - Residential Calculations Sheet - R1			
Roof Angle	21° to 27°			The securement method of the PV system is to be mounted parallel to the Asphalt Shingle roof with the IR XR-10 railing and Halo Ultragrip - HUG flashings/attachments. The mounts should be staggered, where possible, to allow distribution of the design loads evenly to the structure. The mounts shall be installed with (2) #14 Self-Dr, QM RD Structural , to Rafter			
Roof Type	Hip						
Roof Covering	Asphalt Shingle						
Mean Roof Height	15 ft						
Rafter Spacing	24 in O.C.						
Rafter/Truss Size	2 x 4						
Wind Load Parameters							
Wind Speed (asd)	93	mph	FRC R301.2.1.3	Basic Wind Speed (Ult)	120	mph	
Effective Wind Area	22.71	ft ²	26.2	Exposure Cat.	C	B, C, or D	
Wind Directionality	K _d	0.85	Table 26.6-1	Elevation	<1000	ft	
Topographic factor	K _{zt}	1.00	26.8 or 26.8.2	bldg. least hori. dim (typ.)	360	in	
Ground Elevation Factor	K _e	1.00	Table 26.9-1	Roof Height, h	15.00	ft	
Velocity Exposure Coefficient	K _z	0.85	Table 26.10-1	Exposed Module Definition			
Array Edge Factor	γ _E	1.50	Exposed 29.4.4	Exposed factor = 1.5 for uplift loads on panels that are exposed and within a distance of 2h ₂ from an edge of the array. Modules are considered Exposed if d ₁ to the roof edge > 0.5h and one of the following applies: 1. d ₁ to adjacent array > 2h ₂ . 2. d ₂ to the next adjacent panel > 2h ₂ .			
Array Edge Factor	γ _E	1.00	Non. Exp 29.4.4				
Solar Panel Equalization Factor	γ _a	0.66	Fig. 29.4-8(gap = 0.25")				
Velocity Pressure	q _h	18.80	psf				
Added Safety Factor		1					
Allowable Pullout per mount	1004.0	lbs					
0.4h or 0.6h	6.00	ft	Flat - 0.6h, Gab/Hip - 0.4h				
10% of least horizontal dim	3.00	ft	10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h)				
Roof Zone Set Back	a	4.00	ft				
h ₂	6	in	Not > 10in(panel height above roof)				
2h ₂	12	in	*min distance array shall be from the roof edge, Gable Ridge, or hip ridge				
	0.25	in	min gap between all panels but not > 6.7ft				
d1	1.00	ft	Horizontal distance orthogonal to panel edge				
d2	0.25	ft	Horizontal distance from edge of one panel to the nearest edge in the next row				
0.5h	7.50	ft					
PV Attachment - Results							
Exposed	R1 Roof Zones - Hip 21° to 27°			 a = 4ft ; 10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h) B - Horizontal dimension of bldg. normal to wind direction, (ft) h = Mean roof height, in (ft), except that eave height shall be used for θ ≤ 10°. θ = Angle of Plane of roof from horizontal, degrees.			
Non-Exp.	1	2	3				
GC _p - Uplift	-1.19	-1.64	-1.6				
GC _p - Down	0.56	0.56	0.56				
p=q _h K _d (GC _p)(Y _e)(Y _a) (psf)	-16.0	-23.2	-23.2				
ASCE 29.4-7	-16.0	-16.0	-16.0				
	16.0	16.0	16.0				
	16.0	16.0	16.0				
PL(lb) (Portrait Rails) =	-181	-263	-263				
p * A _{eff}	-272.0	-181.3	-181.3				
PL(lb) (Landsc. Rails) =	-128.3	-185.7	-185.7				
p * A _{eff}	-192.4	-128.3	-128.3				
Mx. Span (in) (Portrait)	48	48	48				
	72	48	48				
Mx. Span(in) (Landsc.)	48	48	48				
	72	48	48				
Cantilever (Portrait)	15.8	15.8	15.8				
Span * 33%	23.8	15.8	15.8				
Cantilever (Landsc.)	15.8	15.8	15.8				
Span * 33%	23.8	15.8	15.8				
*** Spans with Mark through denote allowable Module pressure rating is exceeded. 3 Rail is required							
PV Dead Load				RECxxxAA Pure-RX 460 Module Specifications			
QTY of Modules (18 in Portrait,)	18						
Module Area	22.71	ft ²					
Rail, Clamps, Mounts	1	lb/ft					
Total Rail Length	147	ft					
Module W _{mod}	50	lbs					
Array W _{mods}	901	lbs					
Micro/optimizer W _{mic}	72	lbs					
PV Rail W _{PV rail}	147	lbs					
Total Weight W _{total}	1119	lbs					
Total Area A _T	408.85	ft ²					
Dead Load D _{PV}	2.74	psf					
Weight/attachment	33.9	lbs					
Fastener Allowable Pullout				A (ft) B (ft) C (in) D (in) E (in) F (in)			
(2) #14 Self-Dr, QM RD Structural				5.67 4.01 16.14 20.47 7.87 11.81			
Diameter #14				Module load ratings (psf)			
S.G. 0.42				Ultimate Allowable(Ult /1.5)			
Thread Embedment per 3 in				Load Rating - Snow 147.0 98.0			
# of Fastener 2				Load Rating - Wind -84.0 -56.0			
Pullout Value (Source - FL Product Approval) 1004.0 lb _f				Load Rating - Snow 50.4 33.6			
				Load Rating - Wind -50.4 -33.6			
				Portrait			
				Landscape			

