

iRooFAtm
Instant Roof Framing Analysis
www.iroofa.solar
tel: 540.313.5317 - email: info@iRooFA.solar

STRUCTURAL ANALYSIS
for the
ROOFTOP PV SOLAR INSTALLATION

Project: Michael Casile, 30 Wood Barn Ct, Fuquay-Varina, NC 27526

Prepared for:

Top Tier
1530 Center Park Dr - Charlotte, NC 28217

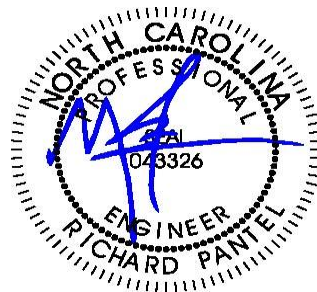
Calculation Report Index

<u>Pages</u>	<u>Description</u>	<u>Pages</u>	<u>Description</u>
1	Cover	2-6	Loading Summary
<i>Roof Structural Calculations for PV Solar Installation</i>		<i>Roof Structural Calculations for PV Solar Installation</i>	
7-9	Location: MP 1	10-12	Location: MP 2
13-13	Snow Loading Calculations		
14-17	Truss FEA Calculations		

Project No: 66.424374, Rev. 0

Report Date: 09/16/2025

Report Prepared by:



Richard Pantel, P.E.
NC License No. 43326
Sealed 09/16/2025

Loading Summary

Exposure and Occupancy Categories		
B		Exposure Category (ASCE 7-10 Table 26.7.3, Page 274)
II		Building Use Occupancy / Risk Category (ASCE 7-10 Table 1.5-1, Page 5)

Wind Loading:			
v	116	mph	ASCE 7-10, Figure 26.5-1 A, B or C, pp 249-251. [(116 mph, 50 year wind MRI)]
qz	20.32	psf	Velocity qz, calculated at height z [ASD]

Snow Loading			
pg	15.00	psf	Ground Snow Load pg (ASCE 7-10 Table 7.2-1, Page 56-60)
Total Snow Load			
ps	15.00	psf	Effective snow load on roof and modules

Module Data			
JA Solar: JAM54S31-405/MR			
Dimensions	mm	ft	in
Length	1,722	5.65	67.80
Width	1,134	3.72	44.65
Area (m ² , ft ²)	2.0	21.02	
Weight	kg	lb	
Module	21.50	47.40	

Roof Panel (Cladding) Loading Summary		Module Loading Summary			
Support Point Loads		Upward	Upward	Upward	Downward
Roof Zones		1	2	3	All
Net load per module	lb	-66	-133	-197	258

Positive values indicate net downward force

Primary Stanchion: IronRidge HALO ULTRAGRIP - (QM-HUG-01-B1)

StanchionFastener Pull-out and Spacing Calculations				
Framing spacing	ft	2.00		
Rails / Module	ea	2		
Max proposed stanchion span	ft	6.00		
# fasteners per stanchion		2		
Bolt thread embedment depth	in	1.75		
Safety Factor		1.10		
Pull-out for #14 threaded fasteners	lb/in	134	<i>lb per inch of embedment</i>	
Factored max fastener uplift capacity	lb	425		
Fastener details	Material	Stainless	Size	#14
Max stanchion uplift capacity	lb	1100	<i>Predrill hole 0.12" dia or use self tapping</i>	
Max support point uplift capacity	lb	425		

Roof Zones			1	2	3
Net lift per module	lb		66	133	197
Min tot bolt thread embedment depth rq'd	in		0.27	0.55	0.81
Net uplift pressure	7. 0.6D - 0.6W	psf	-1.95	-3.91	-5.82
Allowable lift area / support point		sf	217.53	108.62	72.98
Max rail span per support spacing	ft		6.00	6.00	6.00

Landscape Modules					
Length along rafter	ft	3.72			
Lift calc'ed max stanchion EW spacing	ft	> 6	> 6	> 6	
Max stanchion EW spacing	ft	6.00	6.00	6.00	
Maximum module area / support point	sf	11.16	11.16	11.16	
Factored lift per support point	lb	-22	-44	-65	

Portrait Modules					
Length along rafter	ft	5.65			
Lift calc'ed max stanchion EW spacing	ft	> 6	> 6	> 6	
Max stanchion EW spacing	ft	6.00	6.00	6.00	
Maximum module area / support point	sf	16.95	16.95	16.95	
Factored lift per support point	lb	-33	-66	-99	

Alternate Stanchion Fastener Pull-out and Spacing Calculations					
IronRidge HALO ULTRAGRIP - (QM-HUG-01-B1) - 6 screws					
Framing spacing		ft	2.00	Predrill hole 0.12" dia	
Rails / Module		ea	2		
Max proposed stanchion span		ft	6.00		
# fasteners per stanchion			6		
Bolt thread embedment depth		in	0.50		
Safety Factor			1.10		
Pull-out for 1/4 threaded fasteners		lb/in	134		
Factored max fastener uplift capacity		lb	364		
Fastener details	Material	Stainless	Size		1/4
Max stanchion uplift capacity		lb	1100		
Max support point uplift capacity		lb	364		

Roof Zones			1	2	3
Net lift per module	lb		66	133	197
Min tot bolt thread embedment depth rq'd	in		0.09	0.18	0.27
Net uplift pressure	7. 0.6D - 0.6W	psf	-1.95	-3.91	-5.82
Allowable lift area / support point		sf	186.45	93.11	62.55
Max rail span per framing spacing	ft		6.00	6.00	6.00

Landscape Modules					
Length along rafter	ft	3.72			
Lift calc'ed max stanchion EW spacing	ft	> 6	> 6	> 6	
Max stanchion EW spacing	ft	6.00	6.00	6.00	

Maximum module area / support point	<i>sf</i>	11.16	11.16	11.16
Factored lift per support point	<i>lb</i>	-22	-44	-65
Portrait Modules				
Length along rafter	<i>ft</i>	5.65		
Lift calc'ed max stanchion EW spacing	<i>ft</i>	> 6	> 6	> 6
Max stanchion EW spacing	<i>ft</i>	6.00	6.00	6.00
Maximum module area / support point	<i>sf</i>	16.95	16.95	16.95
Factored lift per support point	<i>lb</i>	-33	-66	-99

Stanchion support threaded fastener sizes are indicated in the Module Loading Summary table above. Lift forces were determined from GCp and other coefficients contained in the ASCE nomographs

Conclusions

We were asked to review the roof of Michael Casile, located at 30 Wood Barn Ct, Fuquay-Varina, NC, by Top Tier, to determine its suitability to support a PV solar system installation.

The referenced building's roof structure was field measured by Top Tier. The attached framing analyses reflect the results of those field measurements combined with the PV solar module locations shown on the PV solar roof layout design prepared by Top Tier. Loads are calculated to combine the existing building and environmental loads with the proposed new PV array loads.

The IronRidge XR10 Rail racking and IronRidge HALO ULTRAGRIP - (QM-HUG-01-B1) along with the alternate IronRidge HALO ULTRAGRIP - (QM-HUG-01-B1) - 6 screws stanchions were selected for this project by Top Tier.

The racking and support stanchions shall be placed as shown on their plans, dated 09/16/2025, and shall be fastened to the roof framing using fastener sizes indicated in this report. Rack support spacing shall be no more than that shown above. Note that support points for alternating rows shall share the same truss. Intermediate rows shall move the support points laterally to the next truss.



Google Location Map

Framing Summary

	<u>Ex. Framing</u>	<u>Total Ex DL</u>
MP 1: Truss @ 24" OC	0.79 psf	5.94 psf
MP 2: Truss @ 24" OC	0.79 psf	5.94 psf
* Wood species used in these calculations assumes spruce, pine or fir, #2 grade.		

Based upon the attached calculations, the existing roofs' framing systems are capable of supporting the additional loading for the proposed PV solar system along with the existing building and environmental loads. No supplemental roof framing structural supports are required. No further structural alterations or modifications are needed to support the system. Minimum required anchorage fastening is described above.

Wood fastener notes: 1) Fastener threads must be embedded in the side grain of a roof support structural member or other structural member integrated into the building's structure. 2) Fastener must be located in the middle third of the structural member. 3) Install fasteners with head and where required, washer, flush to material surface (no gap). Do not over-torque.

References and Codes:

- 1) ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
- 2) 2015 IBC
- 3) 2018 NC Building Code
- 4) American Wood Council, NDS 2018, Table 12.2A, 12.3.3A.
- 5) American Wood Council, Wood Structural Design, 1992, Figure 6.

Roof Structural Calculations for PV Solar Installation
Location: MP 1
Member: Truss - Total Length 20 ft, Unsupported 20 ft

Array AR-1
Roof shape: Gable / Hip

Geometric Data				
Θ	deg.	27.0	Angle of roof plane from horizontal, in degrees	
ω	deg.	0.0	Angle the solar panel makes with the roof surface	
L	ft.	62.58	Length of roof plane, in feet (meters)	
W	ft.	18.66	Plan view width of roof plane, in feet (meters)	
h	ft.	14.97	Average height of roof above grade, in feet (meters)	

Roof Wind Zone Width			
	use, a =	3.00	ft

Wind Velocity Pressure, q_z evaluated at the height z						
$q_z=$	20.32	psf	$Vasd\ q_z=$	12.34	psf	Basic wind pressure
V=	116	mph				

Framing Data		
Wood type	US Spruce	
Wood source, moisture content	White 0.12%	
# Framing Members / Support	1	
Rafter / Truss OC	in	24.00
Member Total Length	ft	20.00

3	# Rafters / Rack Support Width
6.00	Rack Support Spacing (ft)
72.00	Max. Rack Support Spacing (in)
1	Max # of mod's / Truss top chord

Member Properties	Member
Name	(1) 2x4
Repetitive Member Factor (Cr)	1.15

* Mem properties based upon field measurements

Truss top chord

Module Data			
Weight	kg	lb	psf load
Module	21.50	47.40	2.26
4 Stanchions	0.91	2.0	0.10

Existing Dead Loads	Units	Value	Description
Roof Deck & Surface Material*	psf	5.15	Truss members' self weight added to FEA analysis

* Roof surface: Shingles, Asphalt, Architectural (Typical)

Rack Support Spacing and Loading				
Across rafters	ft	6.0		
Along rafter slope	ft	5.6		
Area / support point	sf	16.9		
Uphill gap between modules	in	1.0	0.08	ft

Member Total Length	ft	20.00		
Maximum member free span	ft	20.00	Truss top chord span	
Zones	1	2	3	
GCp	-0.94	-1.20	-1.46	

Downward, Zones 1, 2 & 3
GCp 0.71

ASCE 7-10 Chapter 2 Combinations of Loads, Table 2.4, Page 8 (in psf)				
Zones	1	2	3	1, 2 & 3
2.2 SYMBOLS AND NOTATION	<i>Module Upward</i>	<i>Module Upward</i>	<i>Module Upward</i>	<i>Downward</i>
D = dead load of PV Module + Stanchion	2.35	2.35	2.35	2.35
S = snow load	15.00	15.00	15.00	15.00
W = wind load = (Vu Windload) = (Vasd Windload / 0.6)	-11.54	-14.81	-17.99	8.72

2.4 Combining Nominal Loads Using Allowable Stress Design (in psf)				
2.4.1 Basic Combinations. Loads listed herein shall be considered to act in the following combinations; whichever produces the most unfavorable effect in the building, foundation, or structural member being considered. Effects of one or more loads not acting shall be considered.				
Combination Formulae	<i>Upward</i>	<i>Upward</i>	<i>Upward</i>	<i>Downward</i>
Use this loading combination for DOWNWARD for Proposed PV Dead Load				
6. D + 0.75L - 0.75(0 or 0.7)eE + 0.75S	17.35	17.35	17.35	17.52
Module Support point load (lb)	294	294	294	297
Cr Factored Module Support point load (lb)	256	256	256	258

Use this loading combination for UPWARD for Proposed PV Dead Load				
7. 0.6D - 0.6W	-1.95	-3.91	-5.82	4.97
Module Support point load (lb)	-33	-66	-99	84

DOWNWARD

Presume loading directly over member.

Combined Dead and Wind Pressure Downward Loading					
Truss top chord span					
PV Module Row	Point load loc's from Left support	Point Load #'s	Module Support Point Load	Comment	Module Orientation
	<i>ft from left</i>		<i>lb</i>		
1	11.17		258		Portrait
1	16.82			Support placed on adjoining truss	Portrait

Truss Data and Loading for MP 1

Roof slope (degrees)	27.00
Top ridge height above floor plane	9.08

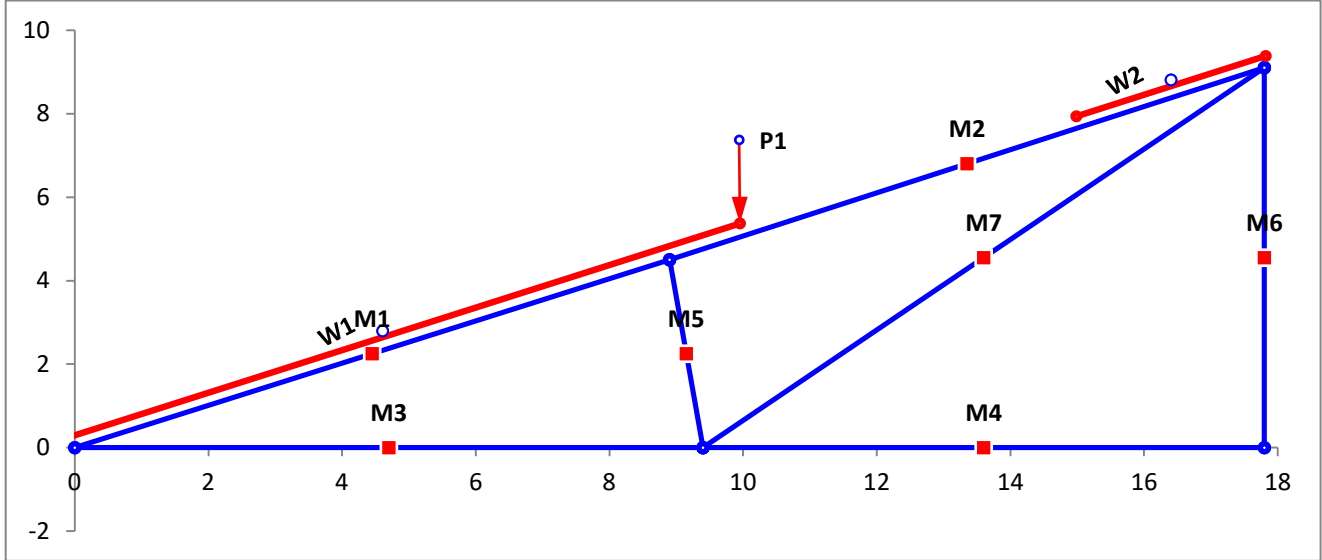
Length of roof plane	20.00
Length of floor plane	17.83

Truss Segments

Roof Plane		Floor Plane	
Mem #	Mem Type	Mem #	Mem Type
1	2x4	3	2x4
2	2x4	4	2x4

Diagonals		Diagonals	
Mem #	Mem Type	Mem #	Mem Type
5	2x4	7	2x4
6	2x4		

* Loading includes member self weight & roofing materials. w loading = wind & snow on exposed areas



Roof Structural Calculations for PV Solar Installation

Location: MP 2

Member: Truss - Total Length 26.67 ft, Unsupported 26.67 ft

Array AR-2

Roof shape: Gable / Hip

Geometric Data				
Θ	deg.	27.0	Angle of roof plane from horizontal, in degrees	
ω	deg.	0.0	Angle the solar panel makes with the roof surface	
L	ft.	31.58	Length of roof plane, in feet (meters)	
W	ft.	24.58	Plan view width of roof plane, in feet (meters)	
h	ft.	16.47	Average height of roof above grade, in feet (meters)	

Roof Wind Zone Width			
	use, a =	3.00	ft

Wind Velocity Pressure, q_z evaluated at the height z						
q_z =	20.32	psf	Vasd q_z =	12.34	psf	Basic wind pressure
V=	116	mph				

Framing Data		
Wood type	US Spruce	
Wood source, moisture content	White 0.12%	
# Framing Members / Support	1	
Rafter / Truss OC	in	24.00
Member Total Length	ft	26.67

3	# Rafters / Rack Support Width
6.00	Rack Support Spacing (ft)
72.00	Max. Rack Support Spacing (in)
3	Max # of mod's / Truss top chord

Member Properties	Member
Name	(1) 2x4
Repetitive Member Factor (Cr)	1.15

* Mem properties based upon field measurements

Truss top chord

Module Data			
Weight	kg	lb	psf load
Module	21.50	47.40	2.26
4 Stanchions	0.91	2.0	0.10

Existing Dead Loads	Units	Value	Description
Roof Deck & Surface Material*	psf	5.15	Truss members' self weight added to FEA analysis

* Roof surface: Shingles, Asphalt, Architectural (Typical)

Rack Support Spacing and Loading				
Across rafters	ft	6.0		
Along rafter slope	ft	5.6		
Area / support point	sf	16.9		
Uphill gap between modules	in	1.0	0.08	ft

Member Total Length	ft	26.67		
Maximum member free span	ft	26.67	Truss top chord span	
Zones	1	2	3	
GCp	-0.94	-1.20	-1.46	

Downward, Zones 1, 2 & 3

GCp 0.71

ASCE 7-10 Chapter 2 Combinations of Loads, Table 2.4, Page 8 (in psf)				
Zones	1	2	3	1, 2 & 3
2.2 SYMBOLS AND NOTATION	<i>Module Upward</i>	<i>Module Upward</i>	<i>Module Upward</i>	<i>Downward</i>
D = dead load of PV Module + Stanchion	2.35	2.35	2.35	2.35
S = snow load	15.00	15.00	15.00	15.00
W = wind load = (Vu Windload) = (Vasd Windload / 0.6)	-11.54	-14.81	-17.99	8.72

2.4 Combining Nominal Loads Using Allowable Stress Design (in psf)				
2.4.1 Basic Combinations. Loads listed herein shall be considered to act in the following combinations; whichever produces the most unfavorable effect in the building, foundation, or structural member being considered. Effects of one or more loads not acting shall be considered.				
Combination Formulae	Upward	Upward	Upward	Downward
Use this loading combination for DOWNWARD for Proposed PV Dead Load				
6. D + 0.75L - 0.75(0 or 0.7)eE + 0.75S	17.35	17.35	17.35	17.52
Module Support point load (lb)	294	294	294	297
Cr Factored Module Support point load (lb)	256	256	256	258

Use this loading combination for UPWARD for Proposed PV Dead Load				
7. 0.6D - 0.6W	-1.95	-3.91	-5.82	4.97
Module Support point load (lb)	-33	-66	-99	84

DOWNWARD

Presume loading directly over member.

Combined Dead and Wind Pressure Downward Loading					
Truss top chord span					
PV Module Row	Point load loc's from Left support	Point Load #'s	Module Support Point Load	Comment	Module Orientation
	<i>ft from left</i>		<i>lb</i>		
1	1.17		258		Portrait
1	6.82			Support placed on adjoining truss	Portrait
2	6.90			Support placed on adjoining truss	Portrait
2	12.55		258		Portrait
3	12.64		258		Portrait
3	18.29			Support placed on adjoining truss	Portrait

Truss Data and Loading for MP 2

Roof slope (degrees)	27.00
Top ridge height above floor plane	12.10

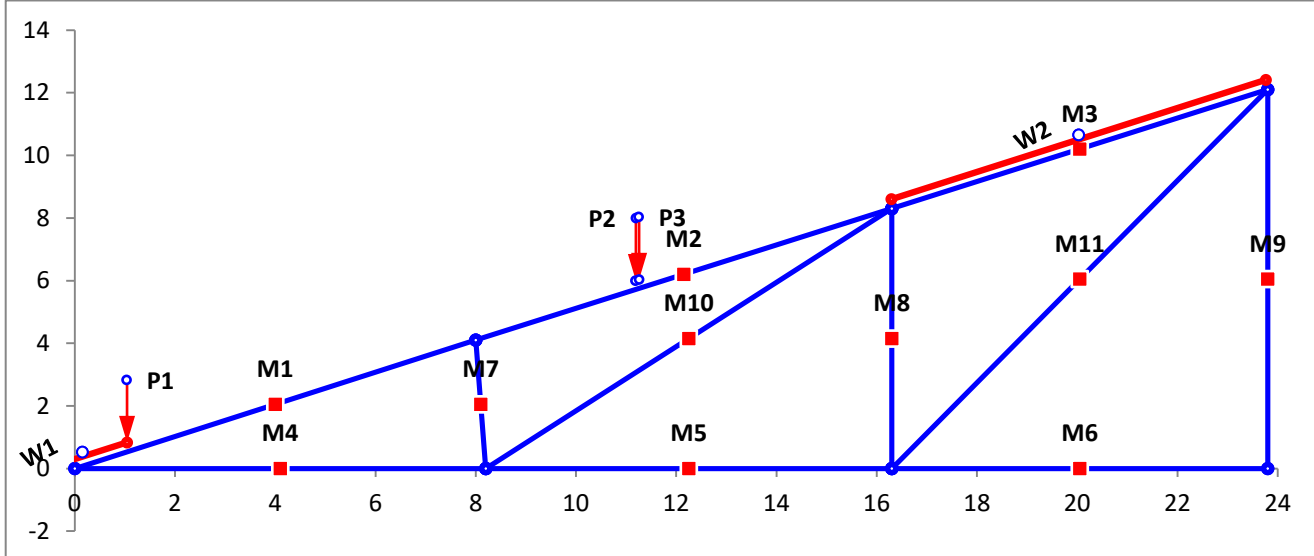
Length of roof plane	26.67
Length of floor plane	23.75

Truss Segments

Roof Plane		Floor Plane	
Mem #	Mem Type	Mem #	Mem Type
1	2x4	4	2x4
2	2x4	5	2x4
3	2x4	6	2x4

Diagonals		Diagonals	
Mem #	Mem Type	Mem #	Mem Type
7	2x4	10	2x4
8	2x4	11	2x4
9	2x4		

* Loading includes member self weight & roofing materials. w loading = wind & snow on exposed areas



Snow Loading Analysis

where:

	Fully Exposed	Exposure category
C_e =	0.9	Exposure Factor, C _e (ASCE 7-10 Table 7.3-1, Page 61)
C_t =	1.0	Thermal Factor, C _t (ASCE 7-10 Table 7.3-2, Page 61)
I_s =	1.0	Snow Importance Factor, I _s (ASCE 7-10 Table 1.5-2, Page 5)
p_g =	15.00	Ground Snow Load p _g (ASCE 7-10 Table 7.2-1, Page 56-60)
p_f =	0.7C_eC_tI_sP_g	Flat Roof Snow Load, p _f (ASCE 7-10 Table 7.3-1, Page 61)
p_f =	9.45	psf
		but where P _f is not less than the following:
		Minimum Snow Load p _m (ASCE 7-10 Table 7.3.4, Page 62)
p_m =	15.00	When P _g ≤ 20 psf, then use P _f = P _g × I _s
p_f =	15.00	psf. Resultant Snow pressure to be used with Roof slope factor below
p_s =	C_sp_f	Sloped Roof Snow Load p _s (ASCE 7-10 Table 7.4, Page 61)
		Roof Type Warm Roofs

Roof slope factor C_s for Warm Roofs, where C_t = 1.0

Roof surface condition = Slippery Roof

C_s = 1.00 Roof Slope Factor, C_s (ASCE 7-10 Table 7.4-1a, Page 62)

Total Snow Load

p_s =	15.00 psf
------------------------	------------------

Roof snow load

FEA Calculation Results for Roof Plane MP 1 for Top Tier Client MICHAEL CASILE
IDSPL - 2D Frame Analysis of a 2D frame subject to distributed loads, point loads and moments

Equilibrium check	FX	FY	0.00174
Total applied forces	0.00	1563	
Total output reactions	0.00	-1563	
Output error	-4.09E-13	-9.09E-13	

Node Results			Beam End Results			
Direction	Deflection	Reaction	Beam	Shear	Axial	BM
DX1	0.00E+00	0	1-1	34	881	0
DY1	0.00E+00	-357	1-2	410	691	0
RZ1	0.00E+00	0	2-1	-142	901	0
DX2	-1.68E-03	0	2-2	601	516	0
DY2	5.44E-03	0	3-1	10	-802	0
RZ2	0.00E+00	0	3-2	161	-802	0
DX3	1.53E-03	0	4-1	0	0	0
DY3	1.15E-03	0	4-2	0	0	0
RZ3	0.00E+00	0	5-1	0	612	0
DX4	-8.02E-04	0	5-2	-1	597	0
DY4	5.24E-03	0	6-1	0	1205	0
RZ4	0.00E+00	0	6-2	0	1155	0
DX5	-8.02E-04	0	7-1	-19	-1063	0
DY5	0.00E+00	-1205	7-2	42	-1129	0
RZ5	0.00E+00	0				
Rel1-3	5.38E-04	0				
Rel1-6	1.18E-03	0				

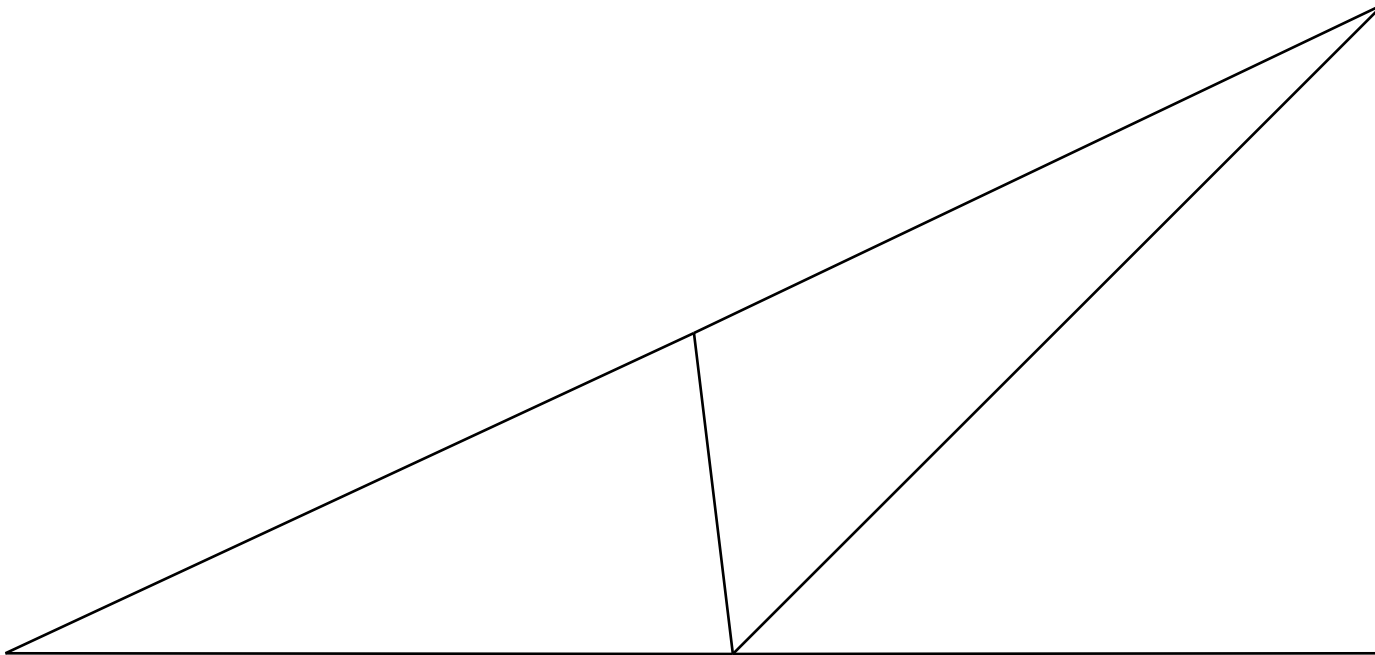
	Shear	Ax
Max (psi)	4	230
Allowable (psi)	115	5,610
# of segments/beam	1	

Maximum Deflections	
-1.72E-03	-5.44E-03

** vertical deflections do not take into account any supporting intermediate walls*

Beam	X	Shear	Mom	Axial	DX	DY	RZ
1	0.00	34	0	881	0.00E+00	0.00E+00	0.00E+00
1	9.97	96	778	850	-1.72E-03	-5.42E-03	8.44E-04
2	0.00	-142	0	901	-1.68E-03	-5.44E-03	0.00E+00
2	10.02	229	5705	709	1.25E-03	-1.01E-03	-1.84E-03
3	0.00	10	0	-802	0.00E+00	0.00E+00	0.00E+00
3	9.40	73	530	-802	-8.02E-04	-5.24E-03	7.38E-04
4	0.00	0	0	0	-8.02E-04	-5.24E-03	0.00E+00
4	8.40	0	0	0	-8.02E-04	-8.67E-19	-6.24E-04
5	0.00	0	0	612	-8.02E-04	-5.24E-03	0.00E+00
5	4.53	-1	0	601	-1.68E-03	-5.44E-03	1.89E-04
6	0.00	0	0	1205	-8.02E-04	0.00E+00	0.00E+00
6	9.10	0	0	1164	1.53E-03	-1.15E-03	-2.56E-04
7	0.00	-19	0	-1063	-8.02E-04	-5.24E-03	0.00E+00
7	12.38	34	4	-1120	1.53E-03	-1.15E-03	-3.97E-04

* vertical deflections do not take into account any supporting intermediate walls



Scaled 2X Deflected Truss Plot
Roof Plane MP 1 for Top Tier Client MICHAEL CASILE

FEA Calculation Results for Roof Plane MP 2 for Top Tier Client MICHAEL CASILE

IDSPL - 2D Frame Analysis of a 2D frame subject to distributed loads, point loads and moments

Equilibrium check	FX	FY	0.00692
Total applied forces	0.00	2723	
Total output reactions	0.00	-2723	
Output error	3.02E-12	-6.37E-12	

Node Results			Beam End Results			
Direction	Deflection	Reaction	Beam	Shear	Axial	BM
DX1	0.00E+00	0	1-1	-189	1956	0
DY1	0.00E+00	-1044	1-2	167	1773	0
RZ1	0.00E+00	0	2-1	-460	2050	0
DX2	-4.30E-03	0	2-2	562	1532	0
DY2	1.23E-02	0	3-1	-65	915	0
RZ2	0.00E+00	0	3-2	573	591	0
DX3	-8.75E-04	0	4-1	16	-1654	0
DY3	9.50E-03	0	4-2	142	-1654	0
RZ3	0.00E+00	0	5-1	0	-787	0
DX4	3.75E-03	0	5-2	0	-787	0
DY4	2.13E-03	0	6-1	0	0	0
RZ4	0.00E+00	0	6-2	0	0	0
DX5	-1.44E-03	0	7-1	0	689	0
DY5	1.21E-02	0	7-2	0	677	0
RZ5	0.00E+00	0	8-1	0	1233	0
DX6	-2.12E-03	0	8-2	0	1191	0
DY6	8.43E-03	0	9-1	0	1678	0
RZ6	0.00E+00	0	9-2	0	1593	0
DX7	-2.12E-03	0	10-1	-17	-1177	0
DY7	0.00E+00	-1678	10-2	38	-1234	0
RZ7	0.00E+00	0	11-1	-19	-1463	0
Rel1-3	1.540E-03	0	11-2	42	-1561	0
Rel1-6	1.845E-03	0				
Rel2-3	-8.874E-03	0				
Rel2-6	8.624E-03	0				

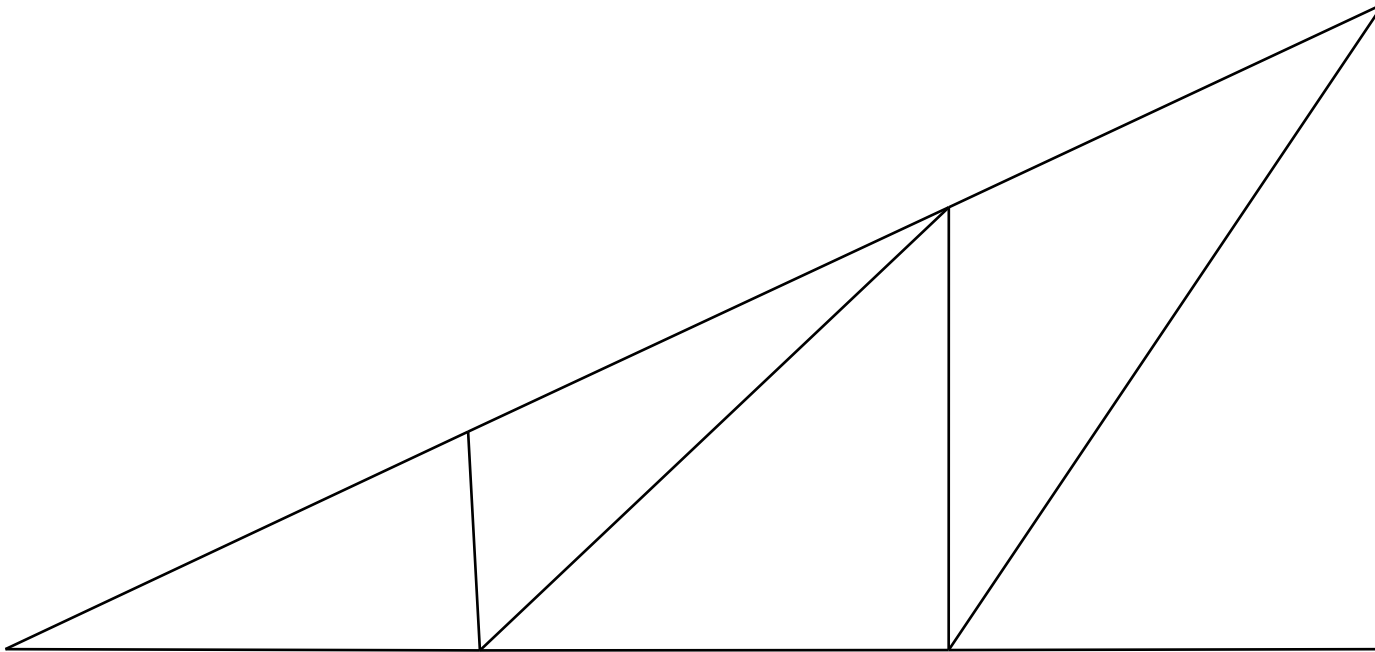
	Shear	Ax
Max (psi)	7	390
Allowable (psi)	115	5,610
# of segments/beam	1	

Maximum Deflections	
-4.32E-03	-1.23E-02

** vertical deflections do not take into account any supporting intermediate walls*

Beam	X	Shear	Mom	Axial	DX	DY	RZ
1	0.00	-189	0	1956	0.00E+00	0.00E+00	0.00E+00
1	8.99	93	450	1811	-4.32E-03	-1.23E-02	1.54E-03
2	0.00	-460	0	2050	-4.30E-03	-1.23E-02	0.00E+00
2	9.30	193	5576	1719	-1.14E-03	-9.37E-03	-3.61E-03
3	0.00	-65	0	915	-8.75E-04	-9.50E-03	0.00E+00
3	8.41	302	4305	729	3.54E-03	-2.02E-03	5.46E-05
4	0.00	16	0	-1654	0.00E+00	0.00E+00	0.00E+00
4	8.20	67	460	-1654	-1.44E-03	-1.21E-02	1.62E-03
5	0.00	0	0	-787	-1.44E-03	-1.21E-02	0.00E+00
5	8.10	0	0	-787	-2.12E-03	-8.43E-03	-4.56E-04
6	0.00	0	0	0	-2.12E-03	-8.43E-03	0.00E+00
6	7.50	0	0	0	-2.12E-03	0.00E+00	-1.12E-03
7	0.00	0	0	689	-1.44E-03	-1.21E-02	0.00E+00
7	4.10	0	0	681	-4.30E-03	-1.23E-02	6.92E-04
8	0.00	0	0	1233	-2.12E-03	-8.43E-03	0.00E+00
8	8.30	0	0	1199	-8.75E-04	-9.50E-03	-1.50E-04
9	0.00	0	0	1678	-2.12E-03	0.00E+00	0.00E+00
9	12.10	0	0	1605	3.75E-03	-2.13E-03	-4.85E-04
10	0.00	-17	0	-1177	-1.44E-03	-1.21E-02	0.00E+00
10	11.60	30	4	-1226	-8.76E-04	-9.50E-03	-2.20E-04
11	0.00	-19	0	-1463	-2.12E-03	-8.43E-03	0.00E+00
11	14.24	35	4	-1549	3.75E-03	-2.13E-03	-6.31E-04

* vertical deflections do not take into account any supporting intermediate walls



Scaled 2X Deflected Truss Plot
Roof Plane MP 2 for Top Tier Client MICHAEL CASILE