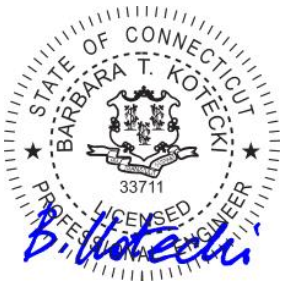
MOUNT ANALYSIS REPORT

Prepared for: Smartlink / AT&T

Site No.:	CTL02122
FA#:	10035123
Site Location:	50 ROCKLAND ROAD NORWALK, CT 06854
Rad Center:	160 ft
Proposed Stress Ratio:	54.2 %
Result:	Pass

June 8, 2020



Barbara T. Kotecki, P.E.

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Project Number: 2020.0032.0029

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Summary

This structural assessment is in regards to the adequacy of the existing sector frames with (1) stiff-arm per sector for the AT&T LTE 6C project. The purpose was to determine conformance of the existing antenna mounting structure under the 2018 Connecticut State Building Code and the industry standard ANSI/TIA-222-H (Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures).

Based on collected information via site visit photos dated 05/10/2020, existing and proposed loading presented in the RFDS provided by AT&T dated 03/27/2020 Ver. 1.00, Construction Drawings by Fullerton Engineering dated 06/06/2018, Mount Analysis Report by Fullerton Engineering dated 11/27/2017, technical data of the proposed equipment, structural calculations and engineering judgment, the existing sector frames with (1) stiff-arm per sector are **adequate** to support the proposed installation for the above-referenced program, **with a maximum stress ratio of 54.2%.**

Final Configuration Loading:

CARRIER	RAD CENTER (FT)	QTY.	MANUFACTURER	MODEL	AZMIMUTH	POSITION
AT&T	160'-0"	2	CCI	HPA-65R-BUU-H6	30°,150°	A1,B1
		2	CCI	OPA65R-BU6DA	30°,150°	A2,B2
		2	Quintel	QS66512-2	30°,150°	A3,B3
		1	Andrew	SBNHH-1D65A	270°	C1
		1	CCI	OPA65R-BU4DA	270°	C2
		1	CCI	QS46512-2	270°	C3
		3	Ericsson	4426 B66	N/A	A1,B1,C1
		3	Ericsson	4478 B14	N/A	A2,B2,C2
		3	Ericsson	RRUS-11 B12	N/A	A3,B3,C3
		3	Ericsson	4478 B5	N/A	A3,B3,C3
		3	Ericsson	RRUS-32 B2	N/A	A3,B3,C3
		3	Ericsson	RRUS-32 B30	N/A	A3,B3,C3
		2	Raycap	DC6-48-60-18-8F	N/A	Mounted to sector frame
		2	Raycap	DC6-48-60-0-8F	N/A	

Member Component Capacity Table:

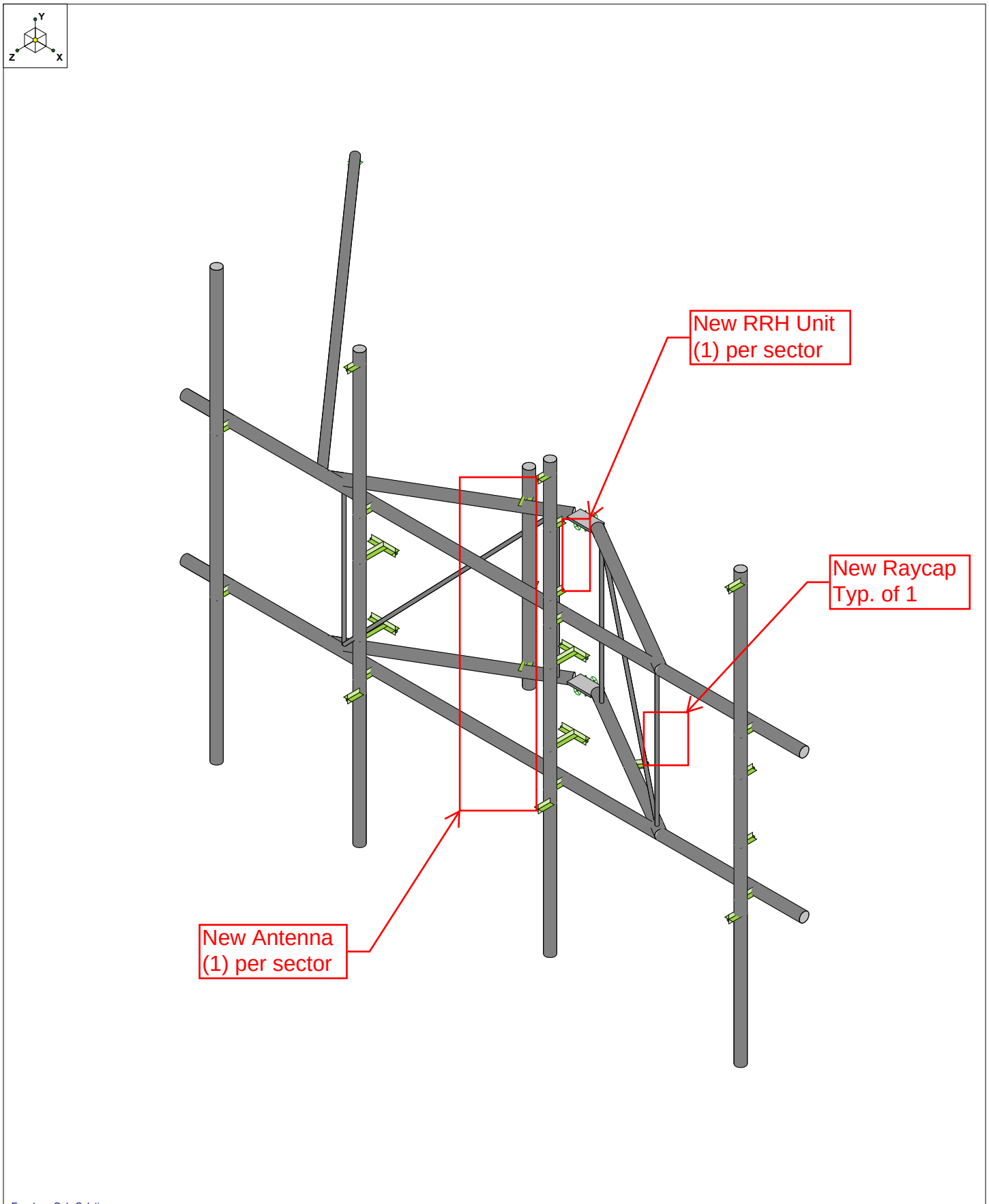
Component	% Capacity	Pass / Fail
Face Horizontals	54.2 %	**Pass**
Standoff Members	27.1 %	**Pass**
Tie-Back	16.5 %	**Pass**
Mounting Pipes	47.7 %	**Pass**
Mount-to-Tower Connection, Threaded Rods	14.18 %	**Pass**

Structural Rating (max from all components) =	**54.2 %**

Summary

This PE certification completed by Fullerton Engineering, P.C. is inclusive of the existing antenna mounting structure that will support the existing and proposed loading provided by the client.

This certification assumes that all the structural members of the existing antenna mounting structure are in good condition and have not been altered from the manufacturer's original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.



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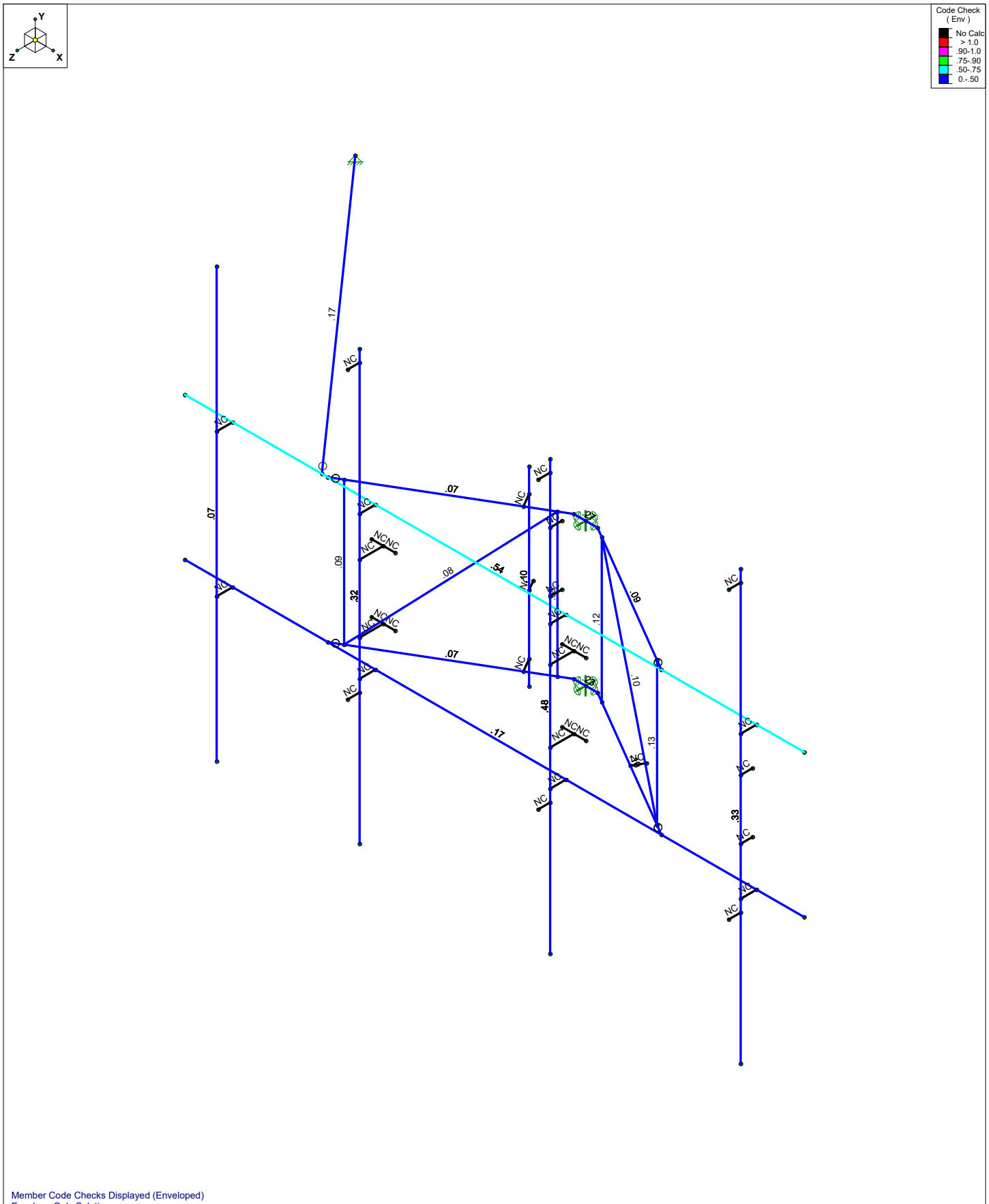
Fullerton Engineering Con...		SK - 1
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	3D Render	CTL02122 - Mount Analysis.r3d



Member Code Checks Displayed (Enveloped)
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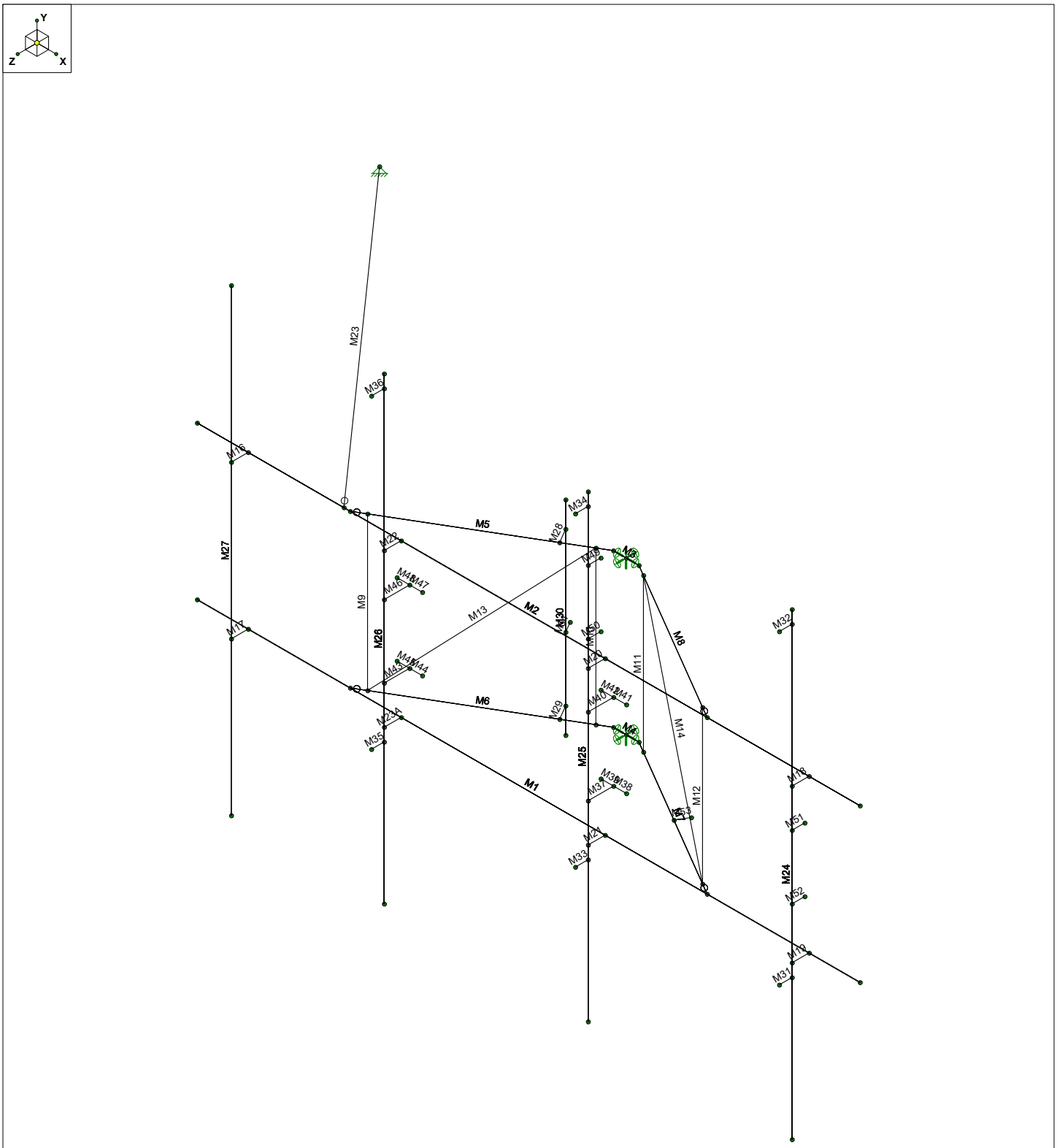
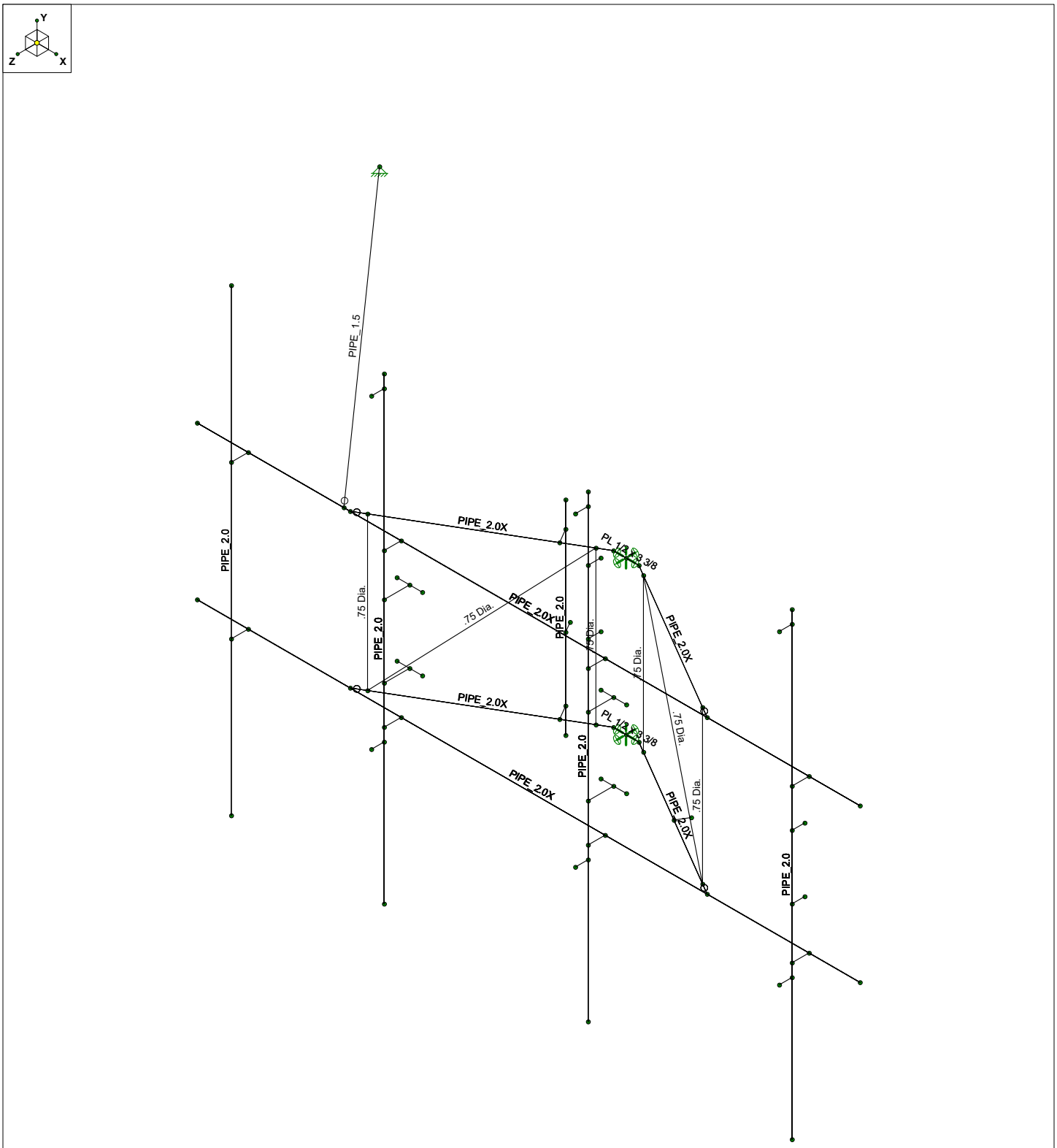
Fullerton Engineering Con...		SK - 2
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	Unity Graphic	CTL02122 - Mount Analysis.r3d



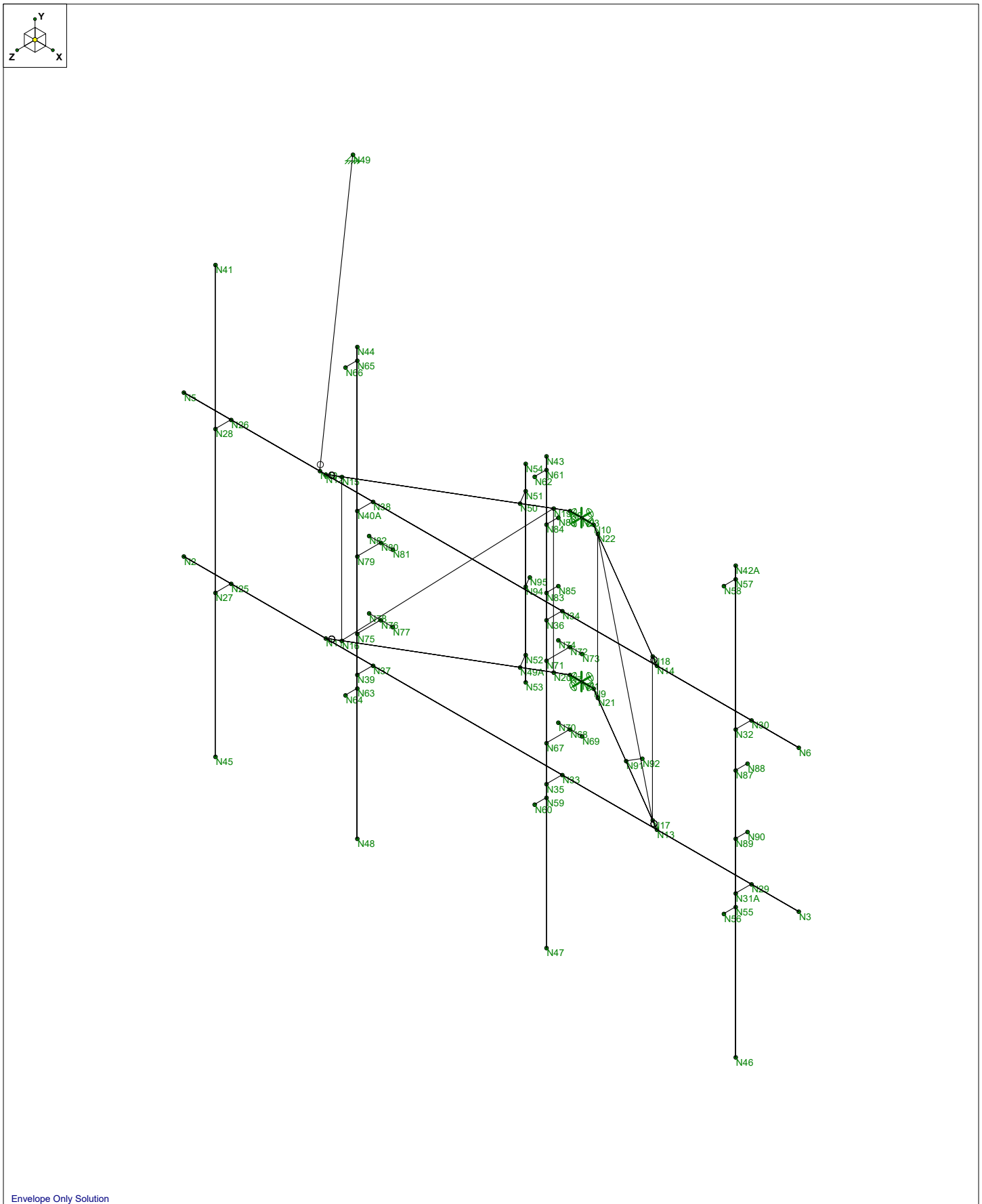
Envelope Only Solution

Fullerton Engineering Con...		SK - 3
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	Member Label	CTL02122 - Mount Analysis.r3d



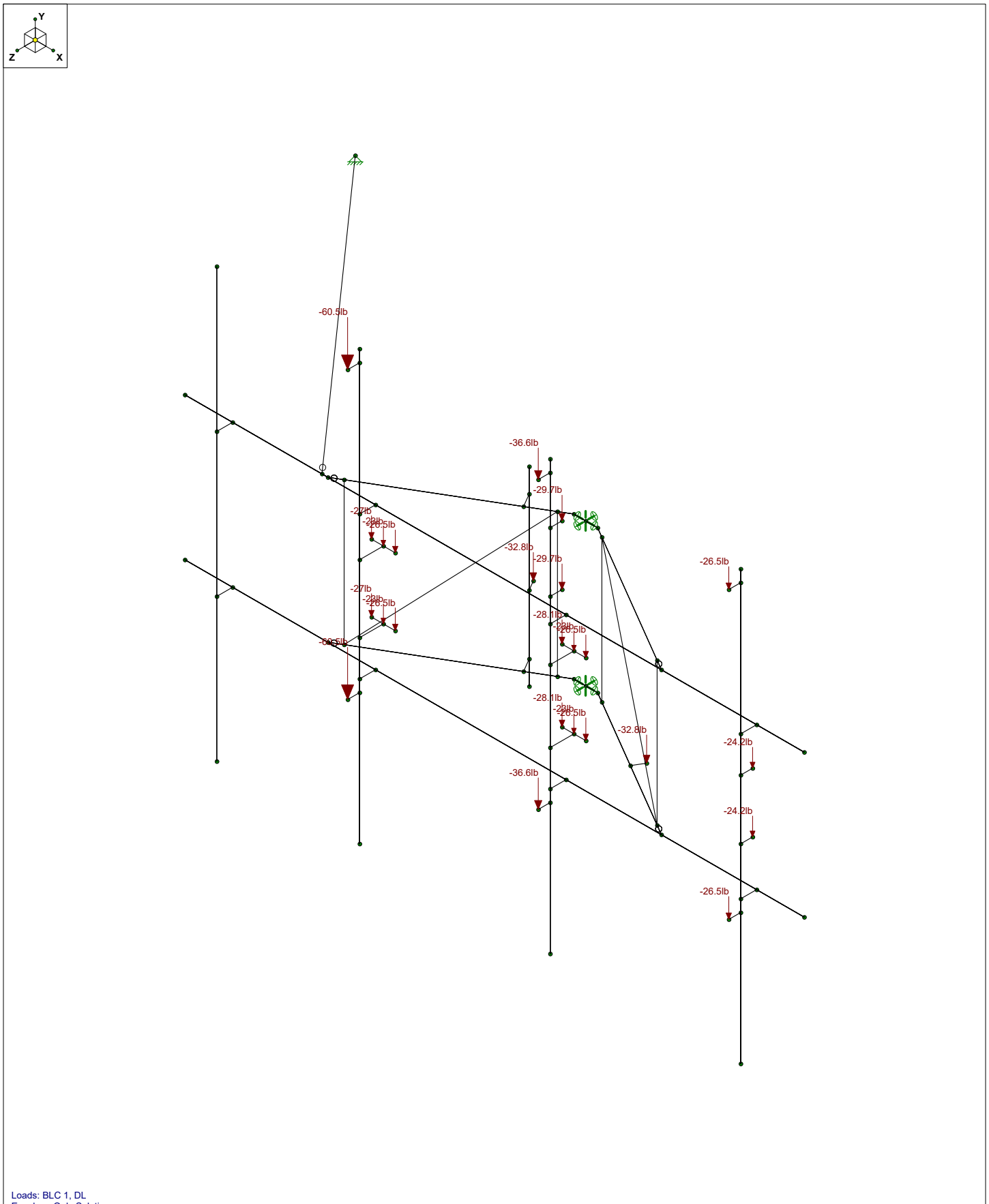
Envelope Only Solution

Fullerton Engineering Con...		SK - 4
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	Shape	CTL02122 - Mount Analysis.r3d



Envelope Only Solution

Fullerton Engineering Con...		SK - 5
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	Nodes	CTL02122 - Mount Analysis.r3d



Loads: BLC 1, DL
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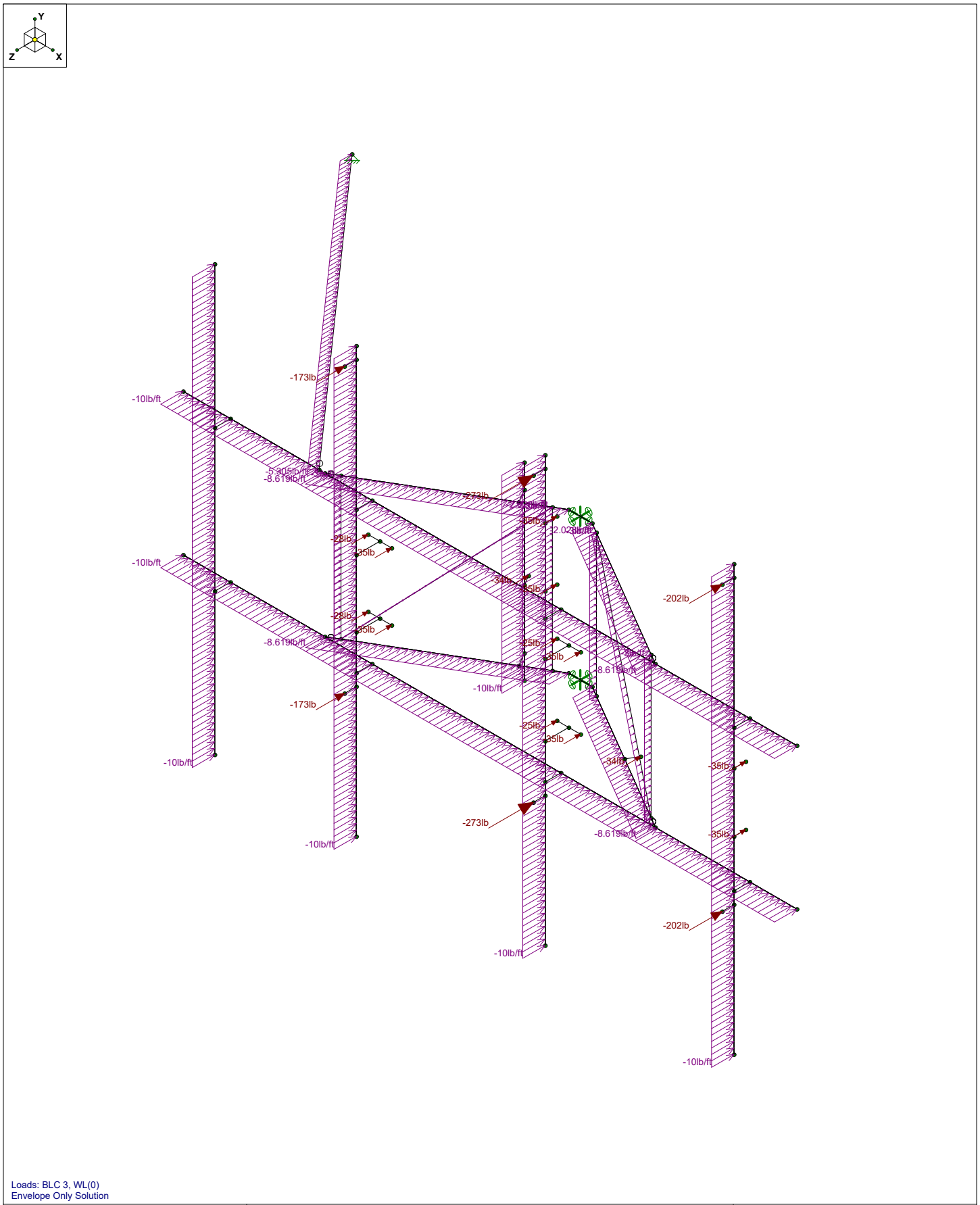
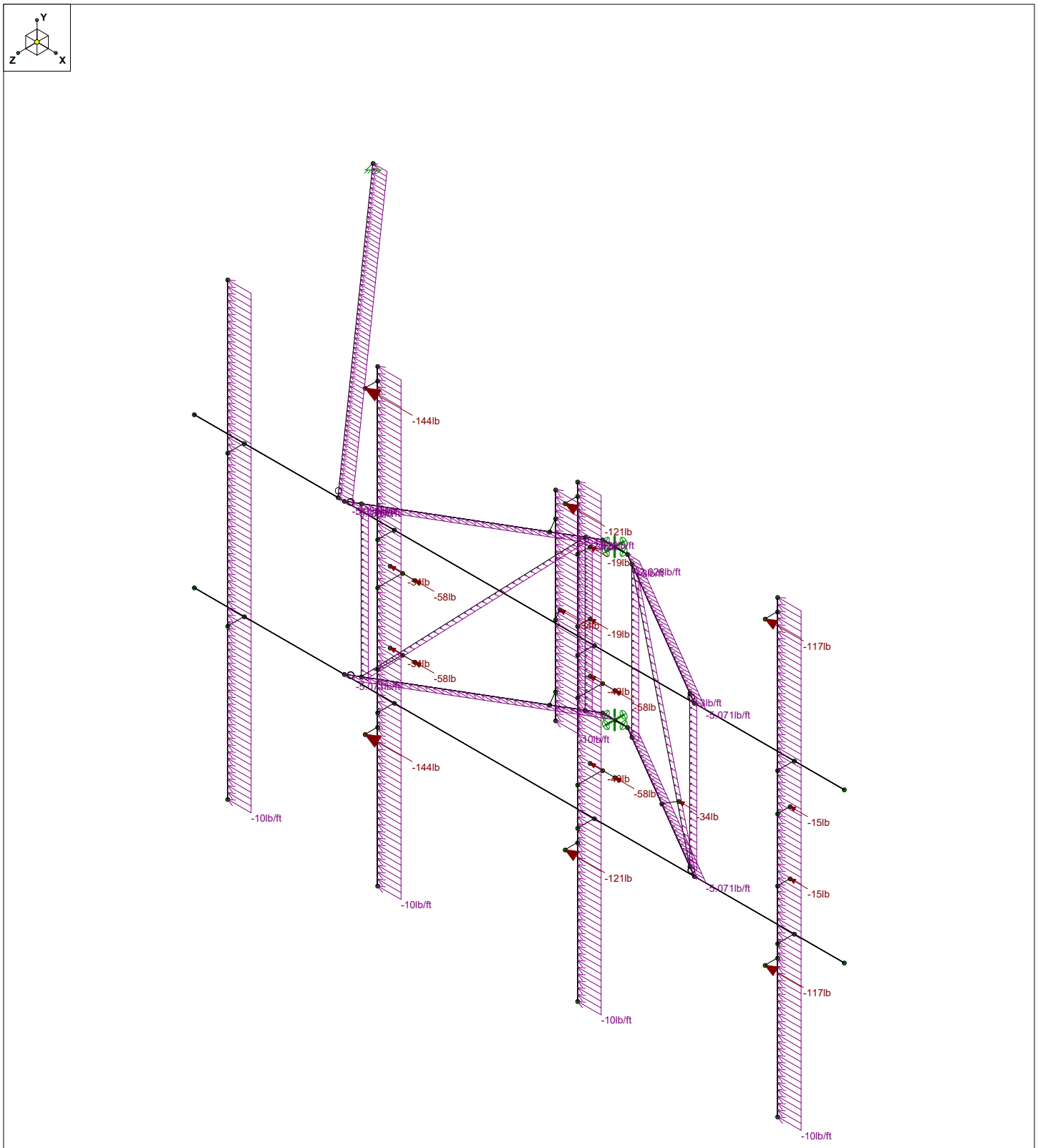
Fullerton Engineering Con...		SK - 6
LA	Mount Analysis	June 8, 2020 at 3:17 PM
CTL02122	Dead Load	CTL02122 - Mount Analysis.r3d



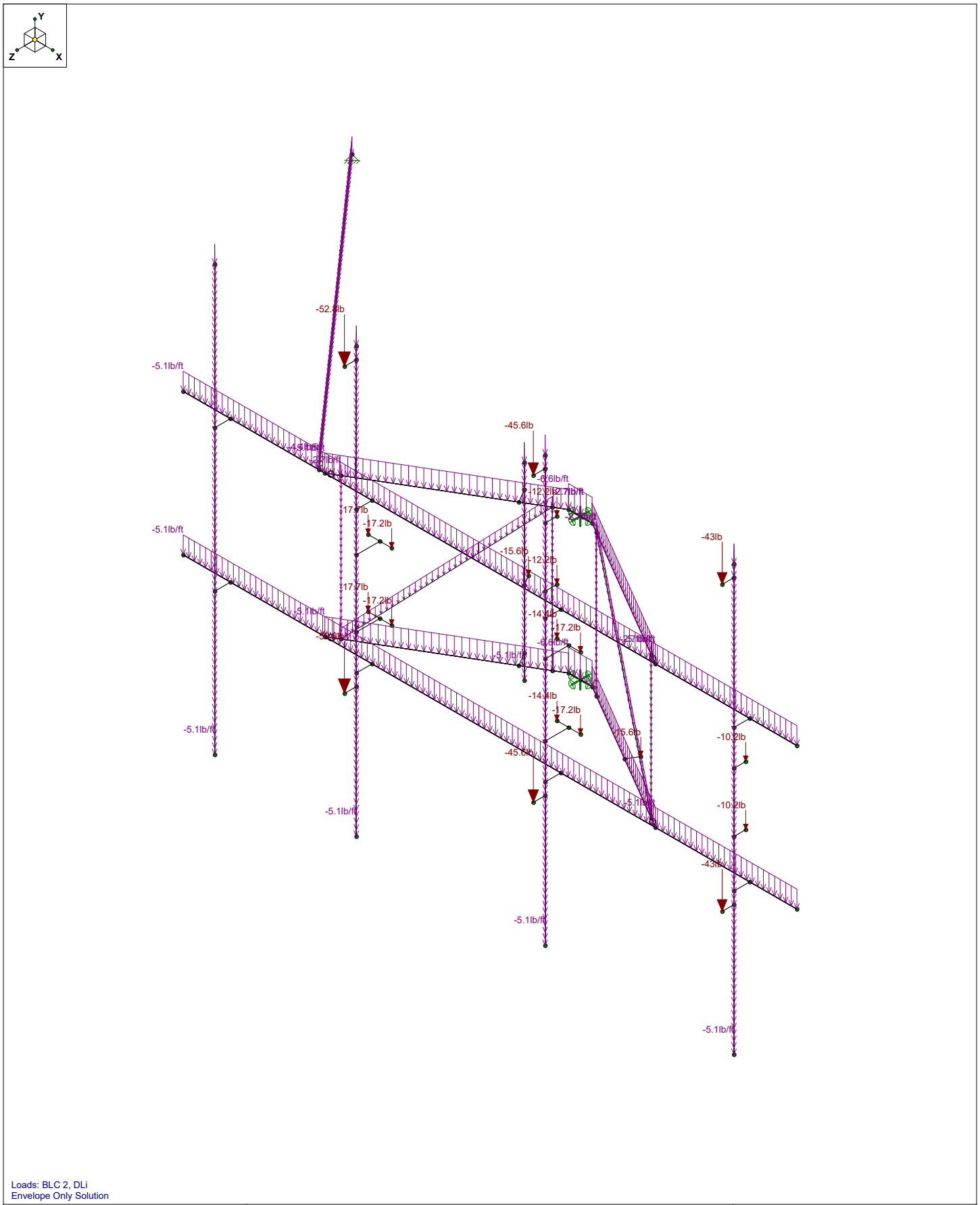
Loads: BLC 3, WL(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 7
LA	Mount Analysis	June 8, 2020 at 3:18 PM
CTL02122	Wind Load (Z-Direction)	CTL02122 - Mount Analysis.r3d



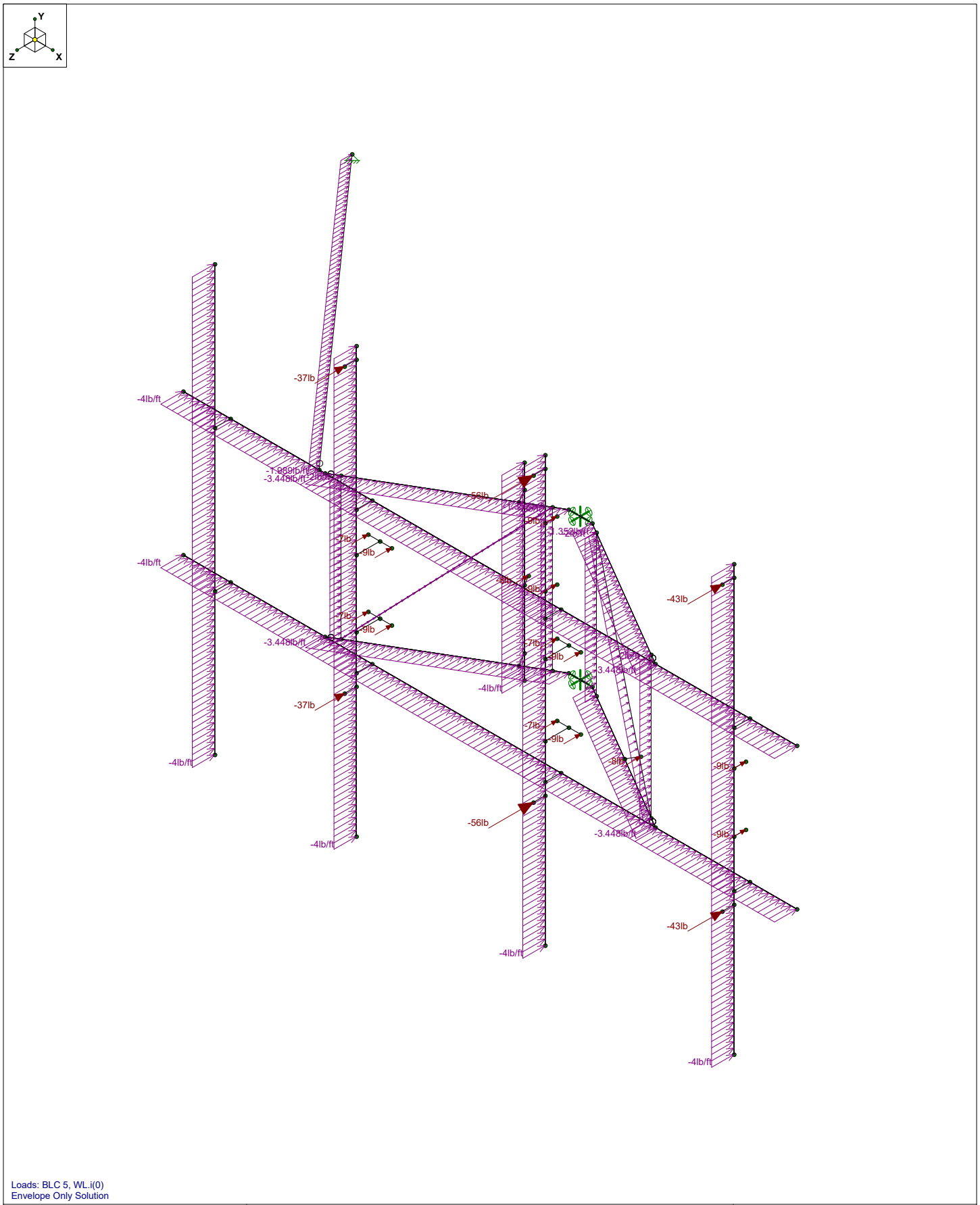
Loads: BLC 4, WL(90)
Envelope Only Solution

Fullerton Engineering Con...		SK - 8
LA	Mount Analysis	June 8, 2020 at 3:18 PM
CTL02122	Wind Load (X-Direction)	CTL02122 - Mount Analysis.r3d



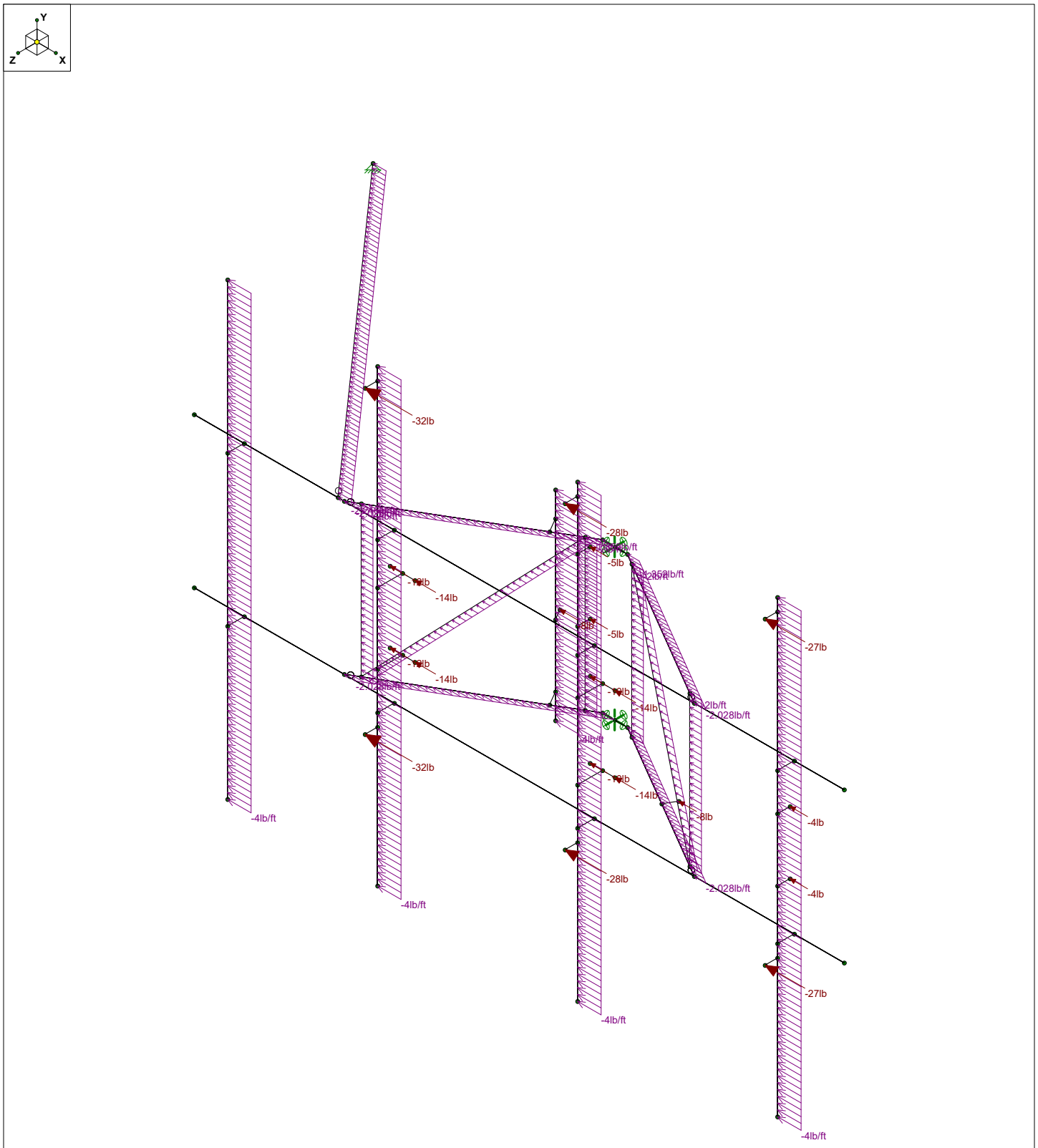
Loads: BLC 2, DLi
Envelope Only Solution

Fullerton Engineering Con...		SK - 9
LA	Mount Analysis	June 8, 2020 at 3:18 PM
CTL02122	Ice Load	CTL02122 - Mount Analysis.r3d



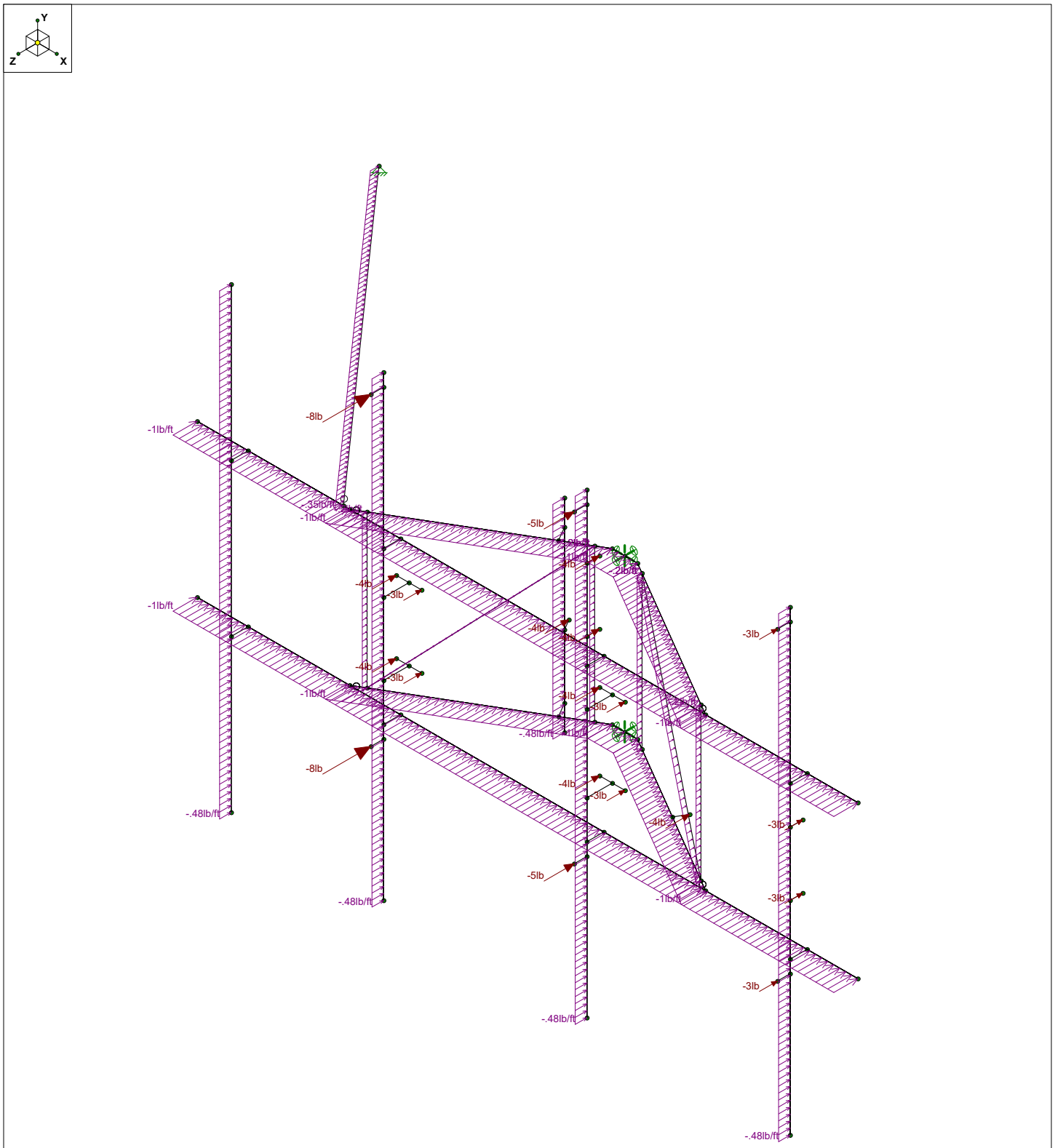
Loads: BLC 5, WL.i(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 10
LA	Mount Analysis	June 8, 2020 at 3:18 PM
CTL02122	Wind Load with Ice (Z-Direction)	CTL02122 - Mount Analysis.r3d



Loads: BLC 6, WL.i(90)
Envelope Only Solution

Fullerton Engineering Con...		SK - 11
LA	Mount Analysis	June 8, 2020 at 3:19 PM
CTL02122	Wind Load with Ice (X-Direction)	CTL02122 - Mount Analysis.r3d



Loads: BLC 8, EH(0)
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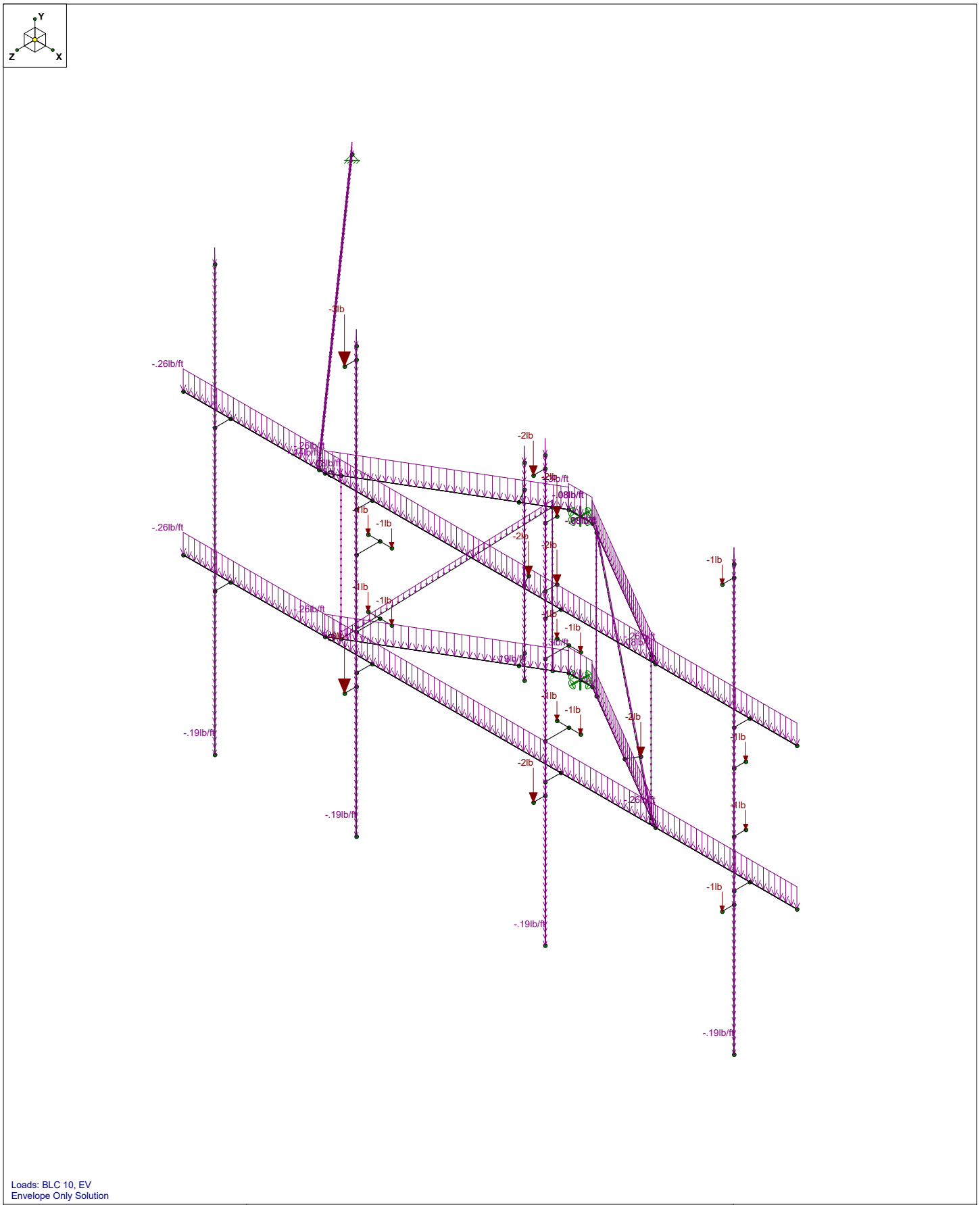
Fullerton Engineering Con...		SK - 12
LA	Mount Analysis	June 8, 2020 at 3:19 PM
CTL02122	Earthquake Load (Horizontal)	CTL02122 - Mount Analysis.r3d



Loads: BLC 10, EV
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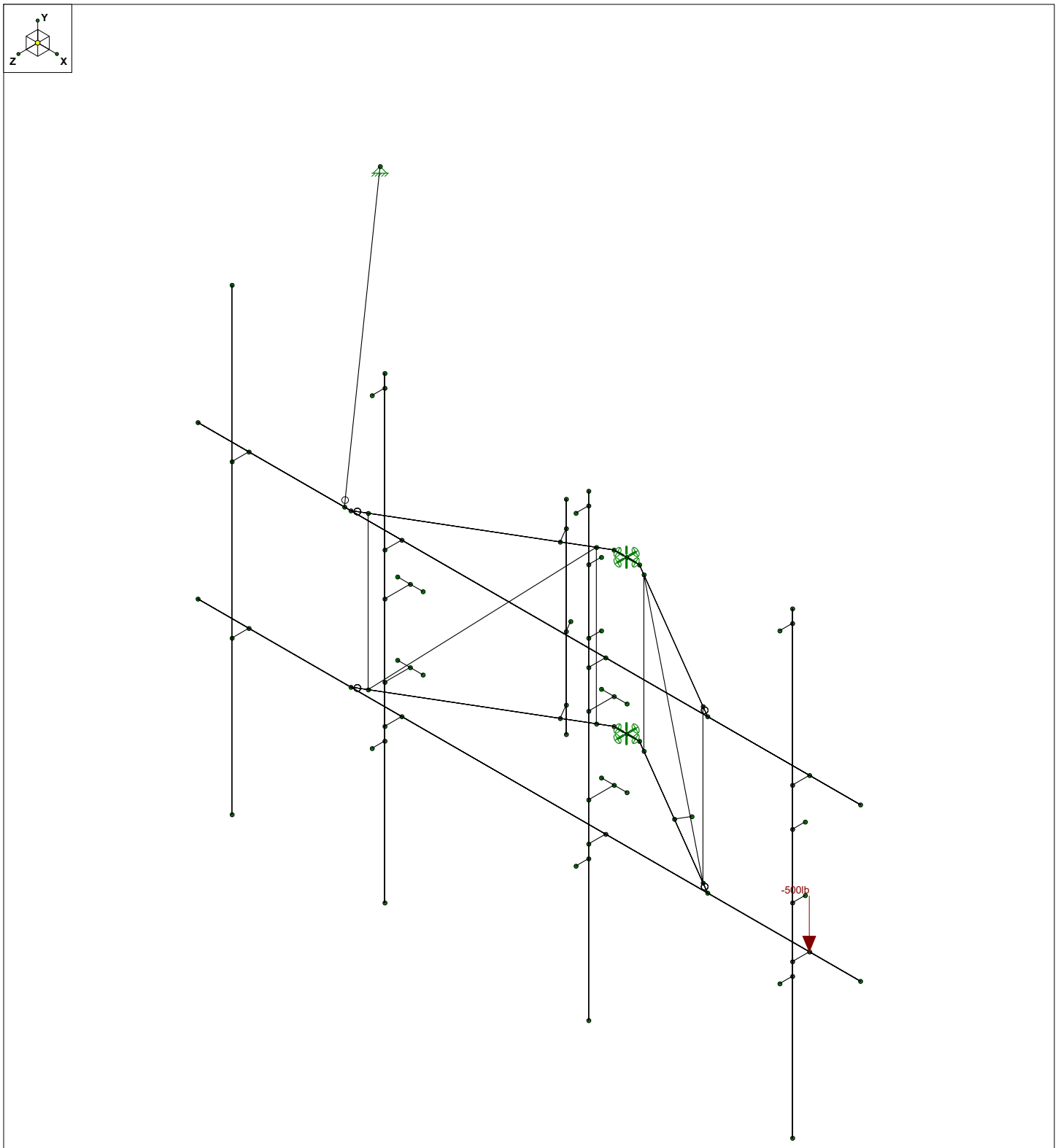
Fullerton Engineering Con...		SK - 13
LA	Mount Analysis	June 8, 2020 at 3:19 PM
CTL02122	Earthquake Load (Vertical)	CTL02122 - Mount Analysis.r3d



500lb Live Loads are applied at mounting pipe positions.
Only one is shown for clarification purposes, but all are considered in the calculations.

Loads: BLC 13, LM1
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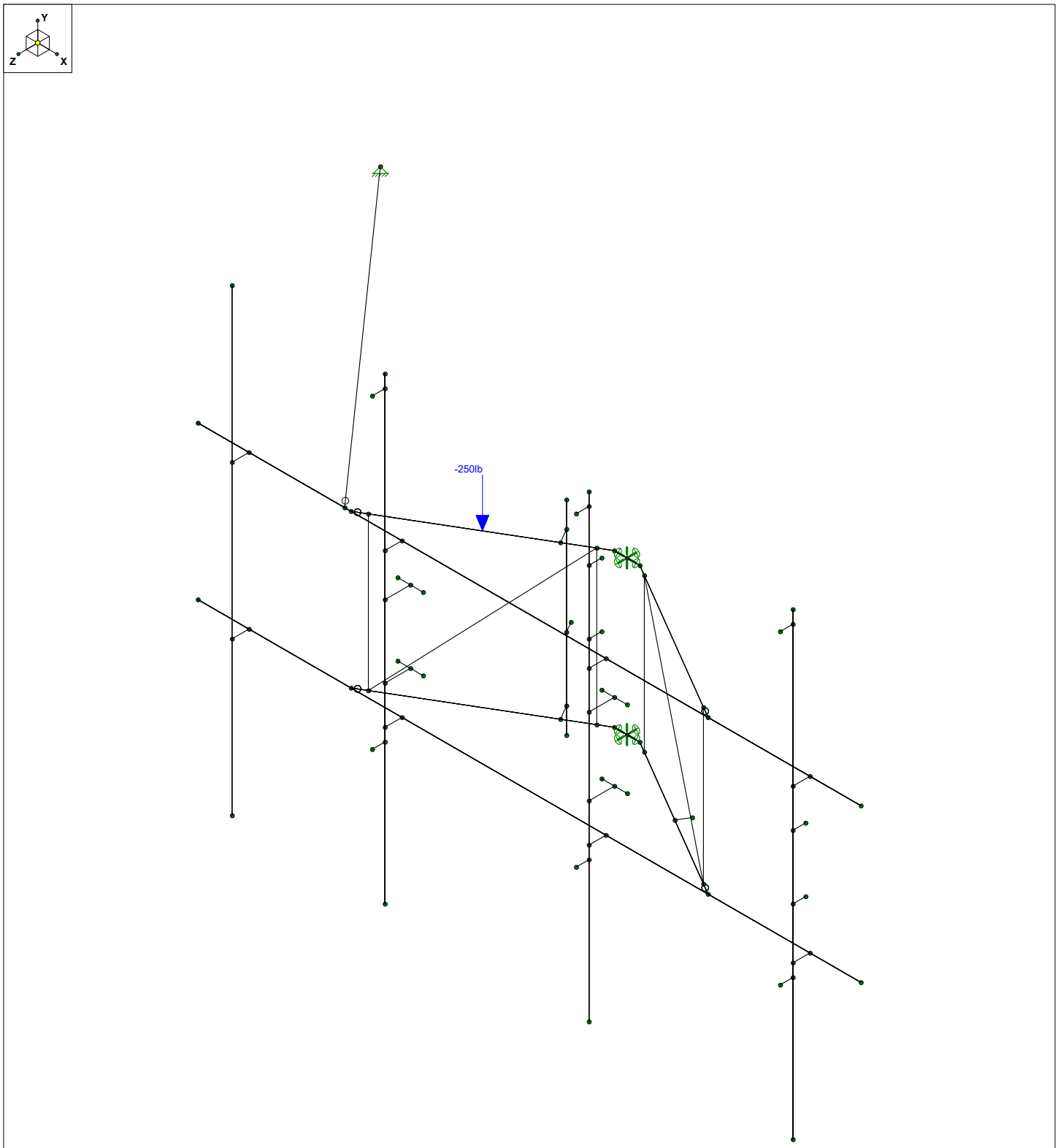
Fullerton Engineering Con...		SK - 14
LA	Mount Analysis	June 8, 2020 at 3:20 PM
CTL02122	500 lb Live Load	CTL02122 - Mount Analysis.r3d



250lb Live Loads are applied on each face horizontal and standoff members.
Only one is shown for clarification purposes, but all are considered in the calculations.

Loads: BLC 16, LV1
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Fullerton Engineering Con...		SK - 15
LA	Mount Analysis	June 8, 2020 at 3:20 PM
CTL02122	250 lb Live Load	CTL02122 - Mount Analysis.r3d

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Site Number: **CTL02122**
Site Name: NORWALK ROCKLAND RD
Created By: LA
Checked By: BTK
Date: 6/8/2020
Code: ANSI/TIA-222-H

Base Structure Type	**Type**	Self Support Tower	
Structure Height Above Grade (ft)	**Ht**	180.00	
RAD Center (ft)	**z**	160.00	
Windspeed no ice (mph, 3-sec gust)	**V**	118.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see ice maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	1.00	see ice maps
Exposure Category (B/C/D)	**Exposure**	C	Section 2.6.5.1.2
Topographic Category (1,2,3,4)	**Topo**	1.00	Section 2.6.6.1
Risk Category (I,II,III, IV)	**Cat**	II	Table 2-1
Crest Height	**H**	0.00	Section 2.6.6.2.1
Height above sea level	**Zs**	57.00	
Exposure Category Coefficient	**zg**	900.00	Table 2-4
Mid-Point of Structure	**Ht.mid**	90.00	
Min Velocity Pressure Coefficient	**Kzmin**	0.85	Table 2-4
Exposure Category Coefficient	**α'**	9.50	Table 2-4
Velocity Pressure Coefficient	**Kz**	1.40	Section 2.6.5.2
Topographic Coefficient	**Kt**	1.00	Table 2-5
Terrain Constant	**Kc**	1.00	Table 2-4
Ground Elevation Factor	**Ke**	1.00	Section 2.6.8
Topographic Category Coefficient	**f**	0.00	Table 2-5
Height Reduction Factor	**Kh**	1.00	Section 2.6.6.2.1
Topographic Factor	**Kzt**	1.00	Section 2.6.6.2.1
Ice Load Importance Factor	**Iti**	1.00	Table 2-3
Wind Direction Probability Factor	**Kd**	0.95	Table 2-2
Height Escalation Factor	**Kiz**	1.17	Section 2.6.10
Gust Effect Factor	**Gh**	1.00	Section 16.6
Design Ice Thickness	**tiz**	1.17	Section 2.6.10
Ice Density	**ρ.ice**	56.00 lbf/ft^3	
Velocity Pressure for Maintenance	**qzm**	3.05	Section 2.6.11.6
Velocity Pressure With Ice	**qzi**	8.48	Section 2.6.11.6
Velocity Pressure No Ice	**qz**	47.22	Section 2.6.11.6

Ka=	0.9

Importance Factor (Earthquake)	I_e	1.00	Table 2-3
Site Class	**Class**	D - Stiff Soil	
Seismic Design Category	**Cat**	B	
MCE_R Ground Motion (period=0.2s)	S_S	0.244	
MCE_R Ground Motion (period=1.0s)	S_1	0.057	
Seismic Design Value at 0.2s	S_{DS}	0.26	
Long-Period Site Coefficient Fv	**Fv**	2.40	Table 2-12
Seismic Design Value at 1.0s	S_{D1}	0.091	Sec. 2.7.5
Long-period Transition Period (s)	T_L	6	

Sesimic Shear		
R	2.000	See 16.7
$C_{S\text{-}calc}$	0.130	See 2.7.7.1.1
$C_{S\text{-}min}$	0.011	See 2.7.7.1.1
C_S	0.130	See 2.7.7.1.1
A_S	1.000	See 16.7

Appurtenance Properties								Loads (force per connection)										
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**Eh**	**Ev**	**EPA.F**
CCIAntennas	HPA-65R-BUU-H6	Flat	72.3	14.4	7.3	52.9	2	26.5	43.0	202	117	43	27	13	8	3	1	9
CCIAntennas	OPA65R-BU6DA	Flat	71.2	21	7.8	73.2	2	36.6	45.6	273	121	56	28	18	8	5	2	13
Quintel	QS66512-2	Flat	72	12	9.6	121	2	60.5	52.8	173	144	37	32	11	9	8	3	8
Commscope	SBNHH-1D65A	Flat	55	11.9	7.1	43.5	2	21.8	32.3	125	82	27	19	8	5	3	1	6
CCIAntennas	OPA65R-BU4DA	Flat	48	21	7.8	62.5	2	31.3	32.4	178	75	37	18	12	5	4	2	8
CCIAntennas	QS46512-2	Flat	52	12	10.8	85	2	42.5	42.7	118	108	26	24	8	7	6	2	6
Ericsson	4426 B66	Flat	14.96	13.19	5.8	48.4	2	24.2	10.2	35	15	9	4	2	1	3	1	2
Ericsson	4478 B14	Flat	15	13.2	7.3	59.4	2	29.7	12.2	35	19	9	5	2	1	4	2	2
Ericsson	RRUS-11 B12	Flat	17	17.8	9.2	54	2	27.0	17.7	54	28	12	7	3	2	4	1	3
Ericsson	4478 B5	Flat	18.1	13.5	7.8	56.1	2	28.1	14.4	43	25	10	7	3	2	4	1	2
Ericsson	RRUS-32 B2	Flat	27.2	12.1	7	53	2	26.5	17.2	58	35	14	9	4	2	3	1	3
Ericsson	RRUS-32 B30	Flat	27.2	12.1	7	53	2	26.5	17.2	58	35	14	9	4	2	3	1	3
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	15.6	34	34	8	8	2	2	4	2	1
Raycap	DC6-48-60-0-8F	Round	24	9.7	9.7	32.8	1	32.8	15.6	34	34	8	8	2	2	4	2	1

Shape Properties								Loads (force per connection)										
Shape Type	**Shape**	**R/F**	**L**	**W**	**D**	**Wt (plf)**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**Eh**	**Ev**	**EPA.F**
Solid_Rod	SR ¾" Dia.	Round	53.3	0.75	0.75	1.50	4.44167	6.68	2.7	3	3	2	2	0.21	0.21	0.20	0.08	0.33
Pipe	Pipe 1½ Std.	Round	98.4	1.9	1.9	2.72	8.2	22.30	4.4	8	8	3	3	1	1	0.35	0.14	2
Pipe	Pipe 2 Std.	Round	108	2.38	2.38	3.66	9	32.94	5.1	10	10	4	4	1	1	0.48	0.19	2
Pipe	Pipe 2 x-Strong	Round	156	2.38	2.38	5.03	13	65.39	5.1	10	10	4	4	1	1	1	0.26	3
Plate	PL 1/2 x 3 3/8	Flat	6	3.38	0.5	5.74	0.5	2.87	6.6	14	3	6	3	1	0.18	1	0.30	0.17

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top...	Lcomp bot...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M9	.75 Dia.	36			Lbyy			.65	.65		Lateral
2	M10	.75 Dia.	36			Lbyy			.65	.65		Lateral
3	M11	.75 Dia.	36			Lbyy			.65	.65		Lateral
4	M12	.75 Dia.	36			Lbyy			.65	.65		Lateral
5	M13	.75 Dia.	53.259			Lbyy			.65	.65		Lateral
6	M14	.75 Dia.	53.259			Lbyy			.65	.65		Lateral
7	M23	PIPE_1.5	98.41			Lbyy			1	1		Lateral
8	M24	PIPE_2.0	108	36	36	36	36	36	2.1	2.1		Lateral
9	M25	PIPE_2.0	108	36	36	36	36	36	2.1	2.1		Lateral
10	M26	PIPE_2.0	108	36	36	36	36	36	2.1	2.1		Lateral
11	M27	PIPE_2.0	108	36	36	36	36	36	2.1	2.1		Lateral
12	M30	PIPE_2.0	48	36	36	36	36	36	2.1	2.1		Lateral
13	M1	PIPE_2.0X	156	84	84	84	84	84	2.1	2.1		Lateral
14	M2	PIPE_2.0X	156	84	84	84	84	84	2.1	2.1		Lateral
15	M5	PIPE_2.0X	45.25			Lbyy			.8	.8		Lateral
16	M6	PIPE_2.0X	45.25			Lbyy			.8	.8		Lateral
17	M7	PIPE_2.0X	45.25			Lbyy			.8	.8		Lateral
18	M8	PIPE_2.0X	45.25			Lbyy			.8	.8		Lateral
19	M3	PL 1/2 x 3 3/8	6			Lbyy			.65	.65		Lateral
20	M4	PL 1/2 x 3 3/8	6			Lbyy			.65	.65		Lateral

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		34	124	0
3	Total General		34	124	0
4					
5	Hot Rolled Steel				
6	A500 Gr. 50	PIPE_1.5	1	98.4	.021

Material Takeoff (Continued)

	Material	Size	Pieces	Length[in]	Weight[K]
7	A53 Gr B 50 ksi	PIPE_2.0X	6	493	.196
8	A53 Gr.B	PIPE_2.0	5	480	.139
9	A572 Gr.50	.75 Dia.	6	250.5	.031
10	A572 Gr.50	PL 1/2 x 3 3/8	2	12	.006
11	Total HR Steel		20	1333.9	.393

Basic Load Cases

	BLC Description	Category	X Gravi...	Y Gravi...	Z Gravity	Joint	Point	Distrib...	Area(M...	Surfac...
1	DL	None		-1		24				
2	DLi	None				20		20		
3	WL(0)	None				20		18		
4	WL(90)	None				20		16		
5	WL.i(0)	None				20		18		
6	WL.i(90)	None				20		16		
7	T	None								
8	EH(0)	None				20		20		
9	EH(90)	None				20		20		
10	EV	None				20		20		
11	WM(0)	None				20		18		
12	WM(90)	None				20		16		
13	LM1	None				1				
14	LM2	None				1				
15	LM3	None				1				
16	LV1	None					1			
17	LV2	None					1			
18	LV3	None					1			
19	LV4	None					1			
20	LV5	None					1			
21	LV6	None					1			

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4*DL	Y...	Y		1	1.4																		
2	1.2*DL + 1.0* WL(0)	Y...	Y		1	1.2	3	1																
3	1.2*DL + 1.0* WL(30)	Y...	Y		1	1.2	3	.869	4	.5														
4	1.2*DL + 1.0* WL(60)	Y...	Y		1	1.2	3	.5	4	.869														
5	1.2*DL + 1.0*WL(90)	Y...	Y		1	1.2	4	1																
6	1.2*DL + 1.0*WL(120)	Y...	Y		1	1.2	3	-.5	4	.869														
7	1.2*DL +1.0*WL(150)	Y...	Y		1	1.2	3	-.8...	4	.5														
8	1.2*DL + 1.0 * WL(180)	Y...	Y		1	1.2	3	-1																
9	1.2*DL + 1.0* WL(210)	Y...	Y		1	1.2	3	-.8...	4	-.5														
10	1.2*DL + 1.0* WL(240)	Y...	Y		1	1.2	3	-.5	4	-.8...														
11	1.2*DL + 1.0*WL(270)	Y...	Y		1	1.2	4	-1																
12	1.2*DL + 1.0*WL(300)	Y...	Y		1	1.2	3	.5	4	-.8...														
13	1.2*DL +1.0*WL(330)	Y...	Y		1	1.2	3	.869	4	-.5														
14	1.2*DL+1.0*DLi+1.0*WL.i(0)+1.0*T	Y...	Y		1	1.2	2	1	5	1	7	1												
15	1.2*DL+1.0*DLi+1.0*WL.i(30)+1.0*T	Y...	Y		1	1.2	2	1	5	.866	6	.5	7	1										
16	1.2*DL+1.0*DLi+1.0*WL.i(60)+1.0*T	Y...	Y		1	1.2	2	1	5	.5	6	.866	7	1										
17	1.2*DL+1.0*DLi+1.0*WL.i(90)+1.0*T	Y...	Y		1	1.2	2	1	6	1	7	1												
18	1.2*DL+1.0*DLi+1.0*WL.i(120)+1.0*T	Y...	Y		1	1.2	2	1	5	-.5	6	.866	7	1										
19	1.2*DL+1.0*DLi+1.0*WL.i(150)+1.0*T	Y...	Y		1	1.2	2	1	5	-.8...	6	.5	7	1										
20	1.2*DL+1.0*DLi+1.0*WL.i(180)+1.0*T	Y...	Y		1	1.2	2	1	5	-1	7	1												
21	1.2*DL+1.0*DLi+1.0*WL.i(210)+1.0*T	Y...	Y		1	1.2	2	1	5	-.8...	6	-.5	7	1										
22	1.2*DL+1.0*DLi+1.0*WL.i(240)+1.0*T	Y...	Y		1	1.2	2	1	5	-.5	6	-.8...	7	1										

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
23	1.2*DL+1.0*DLi+1.0*WL.i(270)+1.0*T	Y...	Y		1	1.2	2	1	6	-1	7	1												
24	1.2*DL+1.0*DLi+1.0*WL.i(300)+1.0*T	Y...	Y		1	1.2	2	1	5	.5	6	-.8...	7	1										
25	1.2*DL+1.0*DLi+1.0*WL.i(330)+1.0*T	Y...	Y		1	1.2	2	1	5	.866	6	-.5	7	1										
26	1.2*DL+1.0*EH(0)+1.0*EV(+)	Y...	Y		1	1.2	8	1	10	1														
27	1.2*DL+1.0*EH(0)+1.0*EV(-)	Y...	Y		1	1.2	8	1	10	-1														
28	1.2*DL+1.0*EH(90)+1.0*EV(+)	Y...	Y		1	1.2	9	1	10	1														
29	1.2*DL+1.0*EH(90)+1.0*EV(-)	Y...	Y		1	1.2	9	1	10	-1														
30	1.2*DL+1.0*EH(180)+1.0*EV(+)	Y...	Y		1	1.2	8	-1	10	1														
31	1.2*DL+1.0*EH(180)+1.0*EV(-)	Y...	Y		1	1.2	8	-1	10	-1														
32	1.2*DL+1.0*EH(270)+1.0*EV(+)	Y...	Y		1	1.2	9	-1	10	1														
33	1.2*DL+1.0*EH(270)+1.0*EV(-)	Y...	Y		1	1.2	9	-1	10	-1														
34	0.9*DL+1.0*EH(0)-1.0*EV(+)	Y...	Y		1	.9	8	1	10	-1														
35	0.9*DL+1.0*EH(0)-1.0*EV(-)	Y...	Y		1	.9	8	1	10	1														
36	0.9*DL+1.0*EH(90)-1.0*EV(+)	Y...	Y		1	.9	9	1	10	-1														
37	0.9*DL+1.0*EH(90)-1.0*EV(-)	Y...	Y		1	.9	9	1	10	1														
38	0.9*DL+1.0*EH(180)-1.0*EV(+)	Y...	Y		1	.9	8	-1	10	-1														
39	0.9*DL+1.0*EH(180)-1.0*EV(-)	Y...	Y		1	.9	8	-1	10	1														
40	0.9*DL+1.0*EH(270)-1.0*EV(+)	Y...	Y		1	.9	9	-1	10	-1														
41	0.9*DL+1.0*EH(270)-1.0*EV(-)	Y...	Y		1	.9	9	-1	10	1														
42	1.2*DL+1.5*LM1+1.0*WM(0)	Y...	Y		1	1.2	13	1.5	11	1														
43	1.2*DL+1.5*LM1+1.0*WM(30)	Y...	Y		1	1.2	13	1.5	11	.866	12	.5												
44	1.2*DL+1.5*LM1+1.0*WM(60)	Y...	Y		1	1.2	13	1.5	11	.5	12	.866												
45	1.2*DL+1.5*LM1+1.0*WM(90)	Y...	Y		1	1.2	13	1.5	12	1														
46	1.2*DL+1.5*LM1+1.0*WM(120)	Y...	Y		1	1.2	13	1.5	11	-.5	12	.866												
47	1.2*DL+1.5*LM1+1.0*WM(150)	Y...	Y		1	1.2	13	1.5	11	-.8...	12	.5												
48	1.2*DL+1.5*LM1+1.0*WM(180)	Y...	Y		1	1.2	13	1.5	11	-1														
49	1.2*DL+1.5*LM1+1.0*WM(210)	Y...	Y		1	1.2	13	1.5	11	-.8...	12	-.5												
50	1.2*DL+1.5*LM1+1.0*WM(240)	Y...	Y		1	1.2	13	1.5	11	-.5	12	-.8...												
51	1.2*DL+1.5*LM1+1.0*WM(270)	Y...	Y		1	1.2	13	1.5	12	-1														
52	1.2*DL+1.5*LM1+1.0*WM(300)	Y...	Y		1	1.2	13	1.5	11	.5	12	-.8...												
53	1.2*DL+1.5*LM1+1.0*WM(330)	Y...	Y		1	1.2	13	1.5	11	.866	12	-.5												
54	1.2*DL+1.5*LM2+1.0*WM(0)	Y...	Y		1	1.2	14	1.5	11	1														
55	1.2*DL+1.5*LM2+1.0*WM(30)	Y...	Y		1	1.2	14	1.5	11	.866	12	.5												
56	1.2*DL+1.5*LM2+1.0*WM(60)	Y...	Y		1	1.2	14	1.5	11	.5	12	.866												
57	1.2*DL+1.5*LM2+1.0*WM(90)	Y...	Y		1	1.2	14	1.5	12	1														
58	1.2*DL+1.5*LM2+1.0*WM(120)	Y...	Y		1	1.2	14	1.5	11	-.5	12	.866												
59	1.2*DL+1.5*LM2+1.0*WM(150)	Y...	Y		1	1.2	14	1.5	11	-.8...	12	.5												
60	1.2*DL+1.5*LM2+1.0*WM(180)	Y...	Y		1	1.2	14	1.5	11	-1														
61	1.2*DL+1.5*LM2+1.0*WM(210)	Y...	Y		1	1.2	14	1.5	11	-.8...	12	-.5												
62	1.2*DL+1.5*LM2+1.0*WM(240)	Y...	Y		1	1.2	14	1.5	11	-.5	12	-.8...												
63	1.2*DL+1.5*LM2+1.0*WM(270)	Y...	Y		1	1.2	14	1.5	12	-1														
64	1.2*DL+1.5*LM2+1.0*WM(300)	Y...	Y		1	1.2	14	1.5	11	.5	12	-.8...												
65	1.2*DL+1.5*LM2+1.0*WM(330)	Y...	Y		1	1.2	14	1.5	11	.866	12	-.5												
66	1.2*DL+1.5*LM3+1.0*WM(0)	Y...	Y		1	1.2	15	1.5	11	1														
67	1.2*DL+1.5*LM3+1.0*WM(30)	Y...	Y		1	1.2	15	1.5	11	.866	12	.5												
68	1.2*DL+1.5*LM3+1.0*WM(60)	Y...	Y		1	1.2	15	1.5	11	.5	12	.866												
69	1.2*DL+1.5*LM3+1.0*WM(90)	Y...	Y		1	1.2	15	1.5	12	1														
70	1.2*DL+1.5*LM3+1.0*WM(120)	Y...	Y		1	1.2	15	1.5	11	-.5	12	.866												
71	1.2*DL+1.5*LM3+1.0*WM(150)	Y...	Y		1	1.2	15	1.5	11	-.8...	12	.5												
72	1.2*DL+1.5*LM3+1.0*WM(180)	Y...	Y		1	1.2	15	1.5	11	-1														
73	1.2*DL+1.5*LM3+1.0*WM(210)	Y...	Y		1	1.2	15	1.5	11	-.8...	12	-.5												
74	1.2*DL+1.5*LM3+1.0*WM(240)	Y...	Y		1	1.2	15	1.5	11	-.5	12	-.8...												
75	1.2*DL+1.5*LM3+1.0*WM(270)	Y...	Y		1	1.2	15	1.5	12	-1														
76	1.2*DL+1.5*LM3+1.0*WM(300)	Y...	Y		1	1.2	15	1.5	11	.5	12	-.8...												
77	1.2*DL+1.5*LM3+1.0*WM(330)	Y...	Y		1	1.2	15	1.5	11	.866	12	-.5												
78	1.2*DL+1.5*LV1	Y...	Y		1	1.2	16	1.5																
79	1.2*DL+1.5*LV2	Y...	Y		1	1.2	17	1.5																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
80	1.2*DL+1.5*LV3	Y...	Y		1	1.2	18	1.5																
81	1.2*DL+1.5*LV4	Y...	Y		1	1.2	19	1.5																
82	1.2*DL+1.5*LV5	Y...	Y		1	1.2	20	1.5																
83	1.2*DL+1.5*LV6	Y...	Y		1	1.2	21	1.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N23	max	682.044	4	1364.742	19	1578.781	13	65.874	2	0	83	127.63	45
2		min	-1449.986	50	558.551	34	-3168.996	7	-119.388	8	0	1	-45.59	75
3	N31	max	1442.987	45	963.119	25	1657.157	14	21.664	48	0	83	104.685	45
4		min	-547.612	75	389.151	38	58.676	8	-48.127	79	0	1	-40.965	78
5	N49	max	766.577	6	30.657	24	830.348	6	0	83	0	83	0	83
6		min	-765.969	12	8.824	36	-829.651	12	0	1	0	1	0	1
7	Totals:	max	1905.596	5	2350.025	15	2637.426	2						
8		min	-1905.596	11	957.838	38	-2637.424	8						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[in]	LC	Shea...	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M2	PIPE_2.0X	.542	118.6...	8	.085	37.375		8	6004.1...	63000	3615	3615	1	H1-1a
2	M25	PIPE_2.0	.477	72	2	.105	45		6	19963....	32130	1871.6...	1871.6...	1	H1-1b
3	M24	PIPE_2.0	.328	72	8	.073	72		8	19963....	32130	1871.6...	1871.6...	1	H1-1b
4	M26	PIPE_2.0	.319	72	13	.095	36		4	19963....	32130	1871.6...	1871.6...	1	H1-1b
5	M3	PL 1/2 x 3 3/8	.271	3	47	.206	3	y	8	71990....	75937.5	791.017	5339.3...	1...	H1-1b
6	M4	PL 1/2 x 3 3/8	.226	3	43	.106	3	y	13	71990....	75937.5	791.017	5339.3...	1...	H1-1b
7	M1	PIPE_2.0X	.166	120.25	47	.051	120.25		46	6004.1...	63000	3615	3615	1	H1-1b
8	M23	PIPE_1.5	.165	98.41	6	.003	98.41		24	6834.9...	33705	1578.75	1578.75	1...	H1-1b*
9	M12	.75 Dia.	.130	36	43	.011	0		6	6408.1...	19880....	248.512	248.512	2...	H1-1b*
10	M11	.75 Dia.	.115	36	45	.010	0		12	6408.1...	19880....	248.512	248.512	2...	H1-1b*
11	M14	.75 Dia.	.099	53.259	46	.010	53.259		3	2927.8...	19880....	248.512	248.512	2...	H1-1b
12	M7	PIPE_2.0X	.099	22.625	81	.051	2.828		62	53566....	63000	3615	3615	1...	H1-1b
13	M30	PIPE_2.0	.098	42	78	.047	6		12	19963....	32130	1871.6...	1871.6...	1	H1-1b
14	M9	.75 Dia.	.092	36	14	.013	0		6	6408.1...	19880....	248.512	248.512	2...	H1-1b*
15	M8	PIPE_2.0X	.092	42.422	47	.059	45.25		60	53566....	63000	3615	3615	2...	H1-1b
16	M13	.75 Dia.	.078	53.259	24	.006	53.259		12	2927.8...	19880....	248.512	248.512	2...	H1-1b
17	M10	.75 Dia.	.077	36	72	.010	0		6	6408.1...	19880....	248.512	248.512	2...	H1-1b*
18	M5	PIPE_2.0X	.075	42.422	71	.062	45.25		69	53566....	63000	3615	3615	2...	H1-1b
19	M27	PIPE_2.0	.071	72	9	.014	72		77	19963....	32130	1871.6...	1871.6...	1	H1-1b
20	M6	PIPE_2.0X	.070	36.294	78	.055	2.828		70	53566....	63000	3615	3615	2...	H1-1b

Stress Ratio < 1.0, members are adequate

Mount-to-Tower Connection Calculations

Existing Sabre sector frame is connected to tower leg via Threaded Rods 5/8" Ø (ASTM A307; nominal tensile strength Fnt=45 ksi and nominal shear strength Fnv=27 ksi according to manufacturer specification)

Maximum Reactions from Risa Mount Analysis per Joint:

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N23	max	682.044	4	1364.742	19	1578.781	13	65.874	2	0	83	127.63	45
2		min	-1449.986	50	558.551	34	-3168.996	7	-119.388	8	0	1	-45.59	75
3	N31	max	1442.987	45	963.119	25	1657.157	14	21.664	48	0	83	104.685	45
4		min	-547.612	75	389.151	38	58.676	8	-48.127	79	0	1	-40.965	78

$X := 1449.986 lbf$ *Maximum Factored Reaction - X direction*

$Y := 1364.742 lbf$ *Maximum Factored Reaction - Y direction*

$Z := 3168.996 lbf$ *Maximum Factored Reaction - Z direction*

$M_x := 119.388\, lbf \cdot ft$ *Maximum Factored Moment - X direction*

$M_z := 127.63\, lbf \cdot ft$ *Maximum Factored Moment - Z direction*

$d := 2in$ *Vertical spacing between the Threaded Rods*

$P_t := \frac{Z}{4} + \frac{M_x}{2.d}$ $P_t = 1150.41 \cdot lbf$ *Factored Tensile Force*

$P_v := \frac{\sqrt{X^2 + Y^2}}{4} + \frac{M_z}{2 \cdot d}$ $P_v = 880.7 \cdot lbf$ *Factored Shear Force*

$d_b := 0.625in$ *Diameter of Threaded Rod*

$A_b := 0.25\pi \cdot d_b^2$ $A_b = 0.31 \cdot in^2$ *Area of Threaded Rod*

$P_{t_rod} := P_t$ $P_{t_rod} = 1150.41 \cdot lbf$ *Tension at Threaded Rod*

$P_{v_rod} := P_v$ $P_{v_rod} = 880.7 \cdot lbf$ *Shear at Threaded Rod*

Tensile and Shear Strength of Rods and Threaded Parts

$F_{nt} := 45ksi$ — *Nominal tensile strength per AISC 360, Table J3.2*

$F_{nv} := 27ksi$ — *Nominal shear strength per AISC 360, Table J3.2*

$\phi_{rod} := 0.75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{rod} \cdot F_{nt} \cdot A_b$ $\boxed{R_{nt} = 10.35 \cdot kip}$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{rod} \cdot F_{nv} \cdot A_b$ $\boxed{R_{nv} = 6.21 \cdot kip}$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$\frac{P_{t_rod}}{R_{nt}} = 11.11 \cdot \%$ ***< 30%***

$\frac{P_{v_rod}}{R_{nv}} = 14.18 \cdot \%$ ***< 30%***

Check = "Threaded rods are adequate. Effects of combined stress don't need to be investigated because ratio of either tension ot shear is under 30%

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	HPA-65R-BUU-H6		OPA65R-BU6DA		QS66512-2									
ANTENNA VENDOR	CCI		CCI		Quintel									
ANTENNA SIZE (H x W x D)	72X14.8X9		71.2X21X7.8		72X12X9.6									
ANTENNA WEIGHT	51		60.2		111									
AZIMUTH	30		30		30									
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	160		160		160									
ANTENNA TIP HEIGHT	163		163		163									
MECHANICAL DOWNTILT	0		0		0									
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-in		Built-in		Built-in								
SURGE ARRESTOR (QTY/MODEL)	2	DC Squid	1	DC/Fiber Squid	1	DC/Fiber Squid								
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006		LTE RRH		LTE RRH								
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	4478 B14	1	RRUS-11 B12								
RRH - 850 band (QTY/MODEL)					1	4478 B5								
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2								
RRH - AWS band (QTY/MODEL)	1	4426 B66												
RRH - WCS band (QTY/MODEL)					1	RRUS-32 B30								
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Rev-6 - LTE 6C - Antennae and Radios as per PD - Add BA Octo - Add 4478 - Add DC/Fiber Squid - Replace BB with 2x6630 + IDLe - Remove 1xXMU													
Local Market Note 2														
Local Market Note 3	1x6601 / 2x6630 / 1xXMU03 + IDLe													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60407.A.850.3G.1	60407.A.850.3G.1	CTV21221	CTV21221		UMTS 850	HPA-65R-BUU-H6_849MHz_02DT	13.5	30	2	None	Commscope 1-5/8 (850)	190								1	
	PORT 2	60407.A.AWS.4G.tmp4	60407.A.AWS.4G.4	CTL06122_2A_2	CTL06122_2A_2		LTE AWS	HPA-65R-BUU-H6_2170MHz_03DT	17.27	30	3	Top	Fiber	0						5070.2572		2	

ANTENNA POSITION 2	**PORT 1**	60407.A.700.4G.tmp5	60407.A.700.4G.5	CTL02122_7A_3_F	CTL02122_7A_3_F		LTE 700	OPA65R-BU6D_763MHz_02DT	13.6	30	2	Top	Fiber	0						2951.413		5	
ANTENNA POSITION 3	**PORT 1**	60407.A.850.4G.1	60407.A.850.4G.1	CTL02122_8A_1	CTL02122_8A_1		LTE 850	QS66512-2_850MHz_02DT	13.2	30	2	Top	Fiber	0						1000		3	
	PORT 2	60407.A.700.4G.1	60407.A.700.4G.1	CTL02122_7A_1	CTL02122_7A_1		LTE 700	QS66512-2_722MHz_02DT	13.6	30	2	Top	Fiber	0						1475.7065		3	
	PORT 3	60407.A.WCS.4G.1	60407.A.WCS.4G.1	CTL02122_3A_1	CTL02122_3A_1		LTE WCS	QS66512-2_2355MHz_02DT	16.8	30	2	Top	Fiber	0						1285.2866		4	
	PORT 4	60407.A.1900.4G.tmp1	60407.A.1900.4G.1	CTL06122_9A_1	CTL06122_9A_1		LTE 1900	QS66512-2_1930MHz_03DT	15.9	30	3	Top	Fiber	0						4842.058		4	
	PORT 5	60407.A.1900.4G.tmp2	60407.A.1900.4G.4	CTL06122_9A_2	CTL06122_9A_2		LTE 1900	QS66512-2_1930MHz_03DT	15.9	30	3	Top	Fiber	0						4842.058		4	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	HPA-65R-BUU-H6	OPA65R-BU6DA	QS66512-2				
ANTENNA VENDOR	CCI	CCI	Quintel				
ANTENNA SIZE (H x W x D)	72X14.8X9	71.2X21X7.8	72X12X9.6				
ANTENNA WEIGHT	51	60.2	111				
AZIMUTH	150	150	150				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	160	160	160				
ANTENNA TIP HEIGHT	163	163	163				
MECHANICAL DOWNTILT	0	0	0				
FEEDER AMOUNT	2						
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in	Built-in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH	LTE RRH	LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4478 B14	1 RRUS-11 B12				
RRH - 850 band (QTY/MODEL)			1 4478 B5				
RRH - 1900 band (QTY/MODEL)			1 RRUS-32 B2				
RRH - AWS band (QTY/MODEL)	1 4426 B66						
RRH - WCS band (QTY/MODEL)			1 RRUS-32 B30				
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Rev-6 - LTE 6C - Antennae and Radios as per PD - Add BA Octo - Add 4478 - Add DC/Fiber Squid - Replace BB with 2x6630 + IDLe - Remove 1xXMU						
Local Market Note 2							
Local Market Note 3	1x6601 / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60407.B.850.3G.1	60407.B.850.3G.1	CTV21222	CTV21222		UMTS 850	HPA-65R-BUU-H6_849MHz_02DT	13.5	150	2	None	Commscope 1-5/8 (850)	190								9	
	PORT 2	60407.B.AWS.4G.tmp4	60407.B.AWS.4G.4	CTL06122_2B_2	CTL06122_2B_2		LTE AWS	HPA-65R-BUU-H6_2170MHz_03DT	0	150	3	Top	Fiber	0						5070.2572		10	

ANTENNA POSITION 2	**PORT 1**	60407.B.700.4G.tmp5	60407.B.700.4G.5	CTL02122_7B_3_F	CTL02122_7B_3_F		LTE 700	OPA65R-BU6D_763MHz_02DT	13.6	150	2	Top	Fiber	0						2951.413		13	
ANTENNA POSITION 3	**PORT 1**	60407.B.850.4G.1	60407.B.850.4G.1	CTL02122_8B_1	CTL02122_8B_1		LTE 850	QS66512-2_850MHz_02DT	13.2	150	2	Top	Fiber	0						1000		11	
	PORT 2	60407.B.700.4G.1	60407.B.700.4G.1	CTL02122_7B_1	CTL02122_7B_1		LTE 700	QS66512-2_722MHz_02DT	13.6	150	2	Top	Fiber	0						1475.7065		11	
	PORT 3	60407.B.WCS.4G.1	60407.B.WCS.4G.1	CTL02122_3B_1	CTL02122_3B_1		LTE WCS	QS66512-2_2355MHz_07DT	16.9	150	7	Top	Fiber	0						1285.2866		12	
	PORT 4	60407.B.1900.4G.tmp1	60407.B.1900.4G.1	CTL06122_9B_1	CTL06122_9B_1		LTE 1900	QS66512-2_1930MHz_04DT	15.6	150	4	Top	Fiber	0						4842.058		12	
	PORT 5	60407.B.1900.4G.tmp2	60407.B.1900.4G.4	CTL06122_9B_2	CTL06122_9B_2		LTE 1900	QS66512-2_1930MHz_04DT	15.6	150	4	Top	Fiber	0						4842.058		12	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	SBNHH-1D65A		OPA65R-BU4DA		QS46512-2									
ANTENNA VENDOR	Andrew		CCI		Quintel									
ANTENNA SIZE (H x W x D)	55X11.9X7.1		48.2X21X7.8		52X12X10.8									
ANTENNA WEIGHT	33.5		52.5		75									
AZIMUTH	270		270		270									
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	160		160		160									
ANTENNA TIP HEIGHT	162		162		162									
MECHANICAL DOWNTILT	0		0		0									
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-in		Built-in		Built-in								
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH		LTE RRH		LTE RRH								
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	4478 B14	1	RRUS-11 B12								
RRH - 850 band (QTY/MODEL)					1	4478 B5								
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2								
RRH - AWS band (QTY/MODEL)	1	4426 B66												
RRH - WCS band (QTY/MODEL)					1	RRUS-32 B30								
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Rev-6 - LTE 6C - Antennae and Radios as per PD - Add BA Octo - Add 4478 - Add DC/Fiber Squid - Replace BB with 2x6630 + IDLe - Remove 1xXMU													
Local Market Note 2														
Local Market Note 3	1x6601 / 2x6630 / 1xXMU03 + IDLe													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60407.C.850.3G.1	60407.C.850.3G.1	CTV21223	CTV21223		UMTS 850	SBNHH-1D65A_851MHz_10DT	12.8	270	10	None	Commscope 1-5/8 (850)	190								17	
	PORT 2	60407.C.AWS.4G.tmp4	60407.C.AWS.4G.4	CTL06122_2C_2	CTL06122_2C_2		LTE AWS	SBNHH-1D65A_2170MHz_03DT	17.1	270	3	Top	Fiber	0						5070.2572		18	

ANTENNA POSITION 2	**PORT 1**	60407.C.700.4G.tmp5	60407.C.700.4G.5	CTL02122_7C_3_F	CTL02122_7C_3_F		LTE 700	OPA65R-BU4D_770MHz_08DT	12.7	270	8	Top	Fiber	0						2951.413		21	
ANTENNA POSITION 3	**PORT 1**	60407.C.850.4G.1	60407.C.850.4G.1	CTL02122_8C_1	CTL02122_8C_1		LTE 850	QS46512-2_850MHz_08DT	12.1	270	8	Top	Fiber	0						1000		19	
	PORT 2	60407.C.700.4G.1	60407.C.700.4G.1	CTL02122_7C_1	CTL02122_7C_1		LTE 700	QS46512-2_722MHz_08DT	12.6	270	8	Top	Fiber	0						1475.7065		19	
	PORT 3	60407.C.WCS.4G.1	60407.C.WCS.4G.1	CTL02122_3C_1	CTL02122_3C_1		LTE WCS	QS46512-2_2355MHz_03DT	16.7	270	3	Top	Fiber	0						1285.2866		20	
	PORT 4	60407.C.1900.4G.tmp1	60407.C.1900.4G.1	CTL06122_9C_1	CTL06122_9C_1		LTE 1900	QS46512-2_1930MHz_04DT	15.6	270	4	Top	Fiber	0						4842.058		20	
	PORT 5	60407.C.1900.4G.tmp2	60407.C.1900.4G.4	CTL06122_9C_2	CTL06122_9C_2		LTE 1900	QS46512-2_1930MHz_04DT	15.6	270	4	Top	Fiber	0						4842.058		20	

ANTENNA MOUNT ANALYSIS CHECKLIST

Mount Detail	
Mount Type	Heavy Duty Sector Frame
Mount Model Number	N/A
If RT, then how is it attached	
If WT, then how is it attached	

Mount Mapping Detail	
Material condition (discoloration, cracks, pitting)	
Mfg. drawing, cutsheet, spec. available?	
Date of mount mapping	
Searched prior OOM for material?	
Photos of installation available?	
Original tower drawings show mounts?	
Searched for previous mapping?	
Is latest mod design (dwgs) available?	
Is the latest structural analysis available?	

Project Detail	
Market	NEW ENGLAND
PACE Project ID	MRCTB047206
Site Name	NORWALK ROCKLAND RD
City, State	NORWALK, CT
RFDS Version Number	1
Initiative (list mult., if applicable)	
Tower Owner	
SA Vendor	
A&E firm (for structural analysis)	
A&E firm (for mapping, if different)	
Last amendment date or last site visit	

Site Information	
Original Lease Date	
FA Code	10035123
Tower Type	Self Support Tower
Tower Height (Ft)	180
AT&T Rad Center # 1	160
AT&T Rad Center # 2	
AT&T Rad Center # 3	

Measurements and Deliverables on sketches	
Pipe / Angle dimenions and lengths	
bolt diameters and lengths	
U-Bolt diameters and lengths	
Steel Grade if indicated	
welds :length and sizes	
appurtenance relative locations	
Grounding Condition	

Equipment Detail Alpha Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approx Az	mount position location
Antennas	(1) CCI HPA-65R-BUU-H6			
Antennas	(1) CCI OPA65R-BU6DA			
Antennas	(1) Quintel QS66512-2			
RRU	(1) Ericsson 4426 B66			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson RRUS-11 B12			
RRU	(1) Ericsson 4478 B5			
RRU	(1) Ericsson RRUS-32 B2			
RRU	(1) Ericsson RRUS-32 B30			
Diplexer				
Coax				
RET (not imbedded in antenna)				
DC Cable				
Fiber Cable				
Squid	(2) Raycap DC6-48-60-18-8F (2) Raycap DC6-48-60-0-8F			

Equipment Detail Beta Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approx Az	mount position location
Antennas	(1) CCI HPA-65R-BUU-H6			
Antennas	(1) CCI OPA65R-BU6DA			
Antennas	(1) Quintel QS66512-2			
RRU	(1) Ericsson 4426 B66			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson RRUS-11 B12			
RRU	(1) Ericsson 4478 B5			
RRU	(1) Ericsson RRUS-32 B2			
RRU	(1) Ericsson RRUS-32 B30			
Diplexer				
Coax				
RET (not imbedded in antenna)				
DC Cable				
Fiber Cable				
Squid				

Equipment Detail Gamma Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approx Az	mount position location
Antennas	(1) Andrew SBNHH-1D65A			
Antennas	(1) CCI OPA65R-BU4DA			
Antennas	(1) Quintel QS46512-2			
RRU	(1) Ericsson 4426 B66			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson RRUS-11 B12			
RRU	(1) Ericsson 4478 B5			
RRU	(1) Ericsson RRUS-32 B2			
RRU	(1) Ericsson RRUS-32 B30			
Diplexer				
Coax				
RET (not imbedded in antenna)				
DC Cable				
Fiber Cable				
Squid				

Comments